SENITRON MONSOON

UHF RFID READER

Senitron Corporation

3/3/2015

FCC Statement

1. **NOTICE;**
   A. The RFID Reader module is limited to OEM installation ONLY.

      The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RFID Reader module is integrated.

   B. 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.

   C. 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 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, integrator, installer, manufacturer or an experienced radio/TV technician for help.

2. **FCC Caution**
   Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. This RFID Reader module must not be co-located or operating in conjunction with any other equipment, including but not limited to, module, antenna or any other transmitter which is not approved or intended for use by the manufacturer,.

3. **Radiation Exposure Statement**
   This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

   The RFID module is designed and intended to installation in mobile or fixed applications according to Part 2.11091(b).

4. **This device is intended only for OEM integrators under the following conditions:**
The antenna must be installed such that minimum 20 cm is maintained between the antenna and users, and the RFID Reader module may not be co-located with any other transmitter or antenna set forth in section 2 above. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

5. **IMPORTANT NOTE:**
In the event that these conditions cannot be met, then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

6. **End Product Labeling**
This RFID Reader module is authorized only for use in device where the antenna may be installed such that minimum 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following:

"Contains FCC ID: 2AED8-SNTRN-RDV1".
The grantee's FCC ID can be used only when all FCC/ IC compliance requirements are met.

7. **Guidance to the Host Manufacturer**
The host manufacturer is responsible for ensuring that after the module is installed and operational the host manufacturer continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, the grantee (the party responsible for the module grant) shall provide guidance to the host manufacturer for compliance with the Part 15B requirement.

8. **Manual Information To the End User**
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RFID Reader module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

9. **Antenna List**

No.	Model	Type	Gain[dBi]	Impedance
1	CUTENNA	Patch Antenna	1.7	50
2	AA-1	Reverse Polarized Antenna	9.0	50

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INTRODUCTION

The Senitron MONSOON™ UHF RFID Reader pushes the price-performance limits of EPC Gen 2 RFID tag & reader systems. The MONSOON™ reader is based on the Impinj® R2000 chipset, providing high sensitivity and advanced noise handling. TCP/IP connectivity and power handling are performed via an integrated Power-over-Ethernet module (PoE), for 'single-cable' installation that does not require lengthy coaxial cable runs.

The module is intended to be used with a variety of antennas and enclosures, given compliance with FCC regulations. The MONSOON™ reader is enclosed in an aluminum case, with connectivity for antennas (MMCX), Power over Ethernet (RJ45), and a debugging / service port (mini-USB), as shown in Figures 1 and 2. Users only utilize the PoE port and MMCX port.

Figure 1: MONSOON™ Reader Antenna Connections

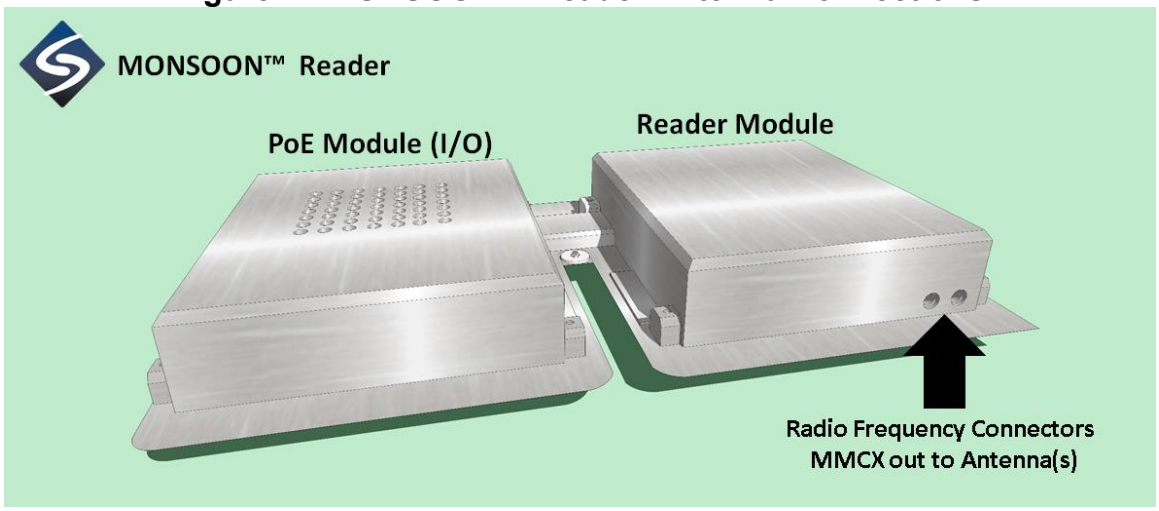
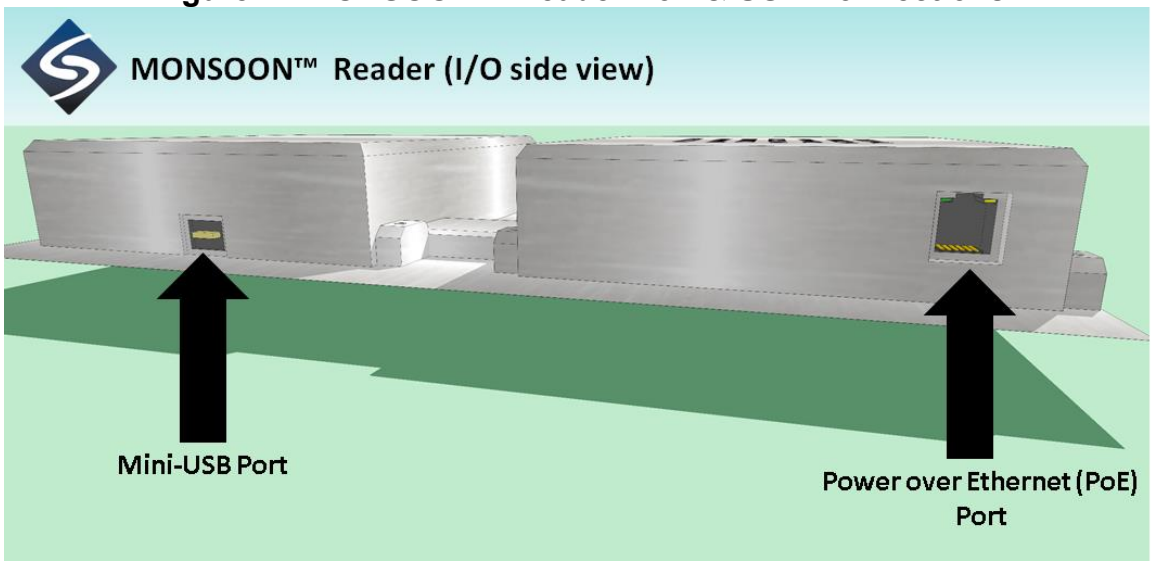


Figure 2: MONSOON™ Reader PoE & USB Connections



SETUP

The MONSOON™ reader is designed to be easy to set up and install. Simply follow the following steps:

1. Connect an ethernet cable from a standard IEEE 802.3af compliant PoE switch to the PoE port on the reader. The MONSOON™ reader can accept DHCP ip address assignments or be assigned a static IP address upon setup.
2. Connect the antenna or antennas to the reader using the MMCX port. The reader can natively support up to two antennas operating in monostatic mode. The RF signal alternates between the two antennas on a sub 1-second interval.

SOFTWARE SETUP AND READER OPERATION

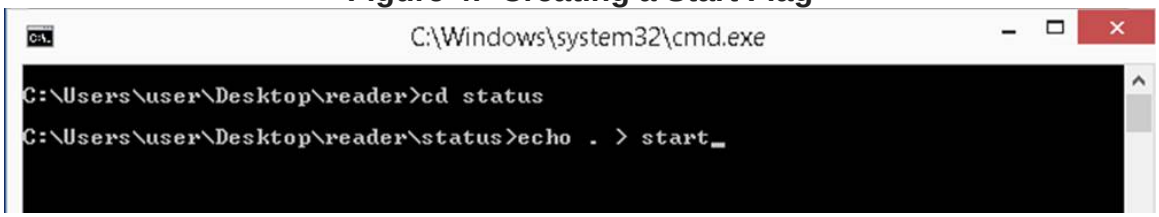
MONSOON™ includes windows-based software to operate the reader. MONSOON™ software allows a computer or a server with 64-bit Microsoft Windows software to communicate with the reader hardware, and ultimately to read Gen 2 compliant UHF RFID Tags. The software activates one or more readers to send the stream of read RFID tags to the host machine, to be saved into a CSV file. The software is a Command Line program, and runs by typing "reader.exe IP-address."

Once the software starts, it does not start reading the EPC Tags right away; instead it waits, and checks its subfolder called "status", for the existence of a file called "start". The "start" file is a blank file, and merely used as a flag to start the reader(s). The program has a settings file, where you can modify the cycle/check seconds, and maximum time out. Once the program stops reading new tags, the readers automatically stops, and saves the data into the "output" folder, as file called data.csv. Furthermore once the program has done its operation it creates a flag file in the "status" folder called "stop". Each reader is controlled by referencing its ip address (IPv4), as shown in Figure 3.

Figure 3: Example run command: "reader 192.168.2.3 192.168.2.4"

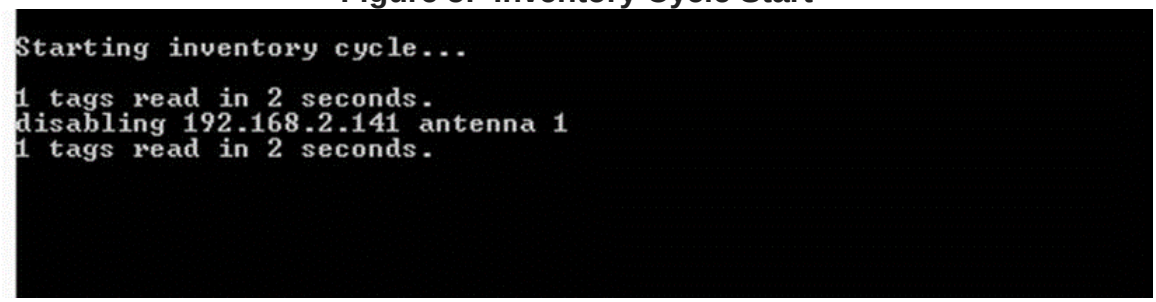
Create the start flag by clicking and running “create start flag” shortcut or by manuallly typing “cd status” “echo . > start”, as shown in Figure 4.

Figure 4: Creating a Start Flag



Once the software sees the flag it starts reading. Note: if a specific antenna port does not have reads it disables checking that port, as shown in Figure 5:

Figure 5: Inventory Cycle Start



RFID raw read data is stored in comma separated value (CSV text file) format in the MONSOON directory. CSV files are readily compatible for input to spreadsheet and relational database software for further analysis.

SUPPORT

Senitron recommends completing a full software and installation design review prior to implementation. Please contact your senitron account manager (www.senitron.net).