Sensormatic®

PRELIMINARY

IDX-4000 UHF RFID Reader

Quick Start Guide

About this guide

This guide provides overview information on how to connect and mount the IDX-4000 UHF RFID Reader. This guide also includes information on LED definitions, the ports on the reader, and regulatory and compliance information.

Additional documentation

If installing the IDX-4000 UHF RFID reader as part of a solution, refer to the following relevant solution guide for complete installation and configuration procedures:

- *Synergy Dual Technology Pedestal Installation Guide, 8200-1014-40.*
- *Fitting Room 360º Installation Guide, 8200-2697-23.*
- *Transition and Receiving Door Solution Installation Guide, 8200-2697-24.*
- *Overhead RFID as EAS Installation and Service Guide, 8200-1075-03.*

Technical support

For product bulletins, and updates to this guide, visit https://sensormaticsecurelogin.com.

About the product

The IDX-4000 four port UHF RFID reader is an intelligent, highly integrated UHF RFID tag reader. The IDX-4000 is the hardware foundation for all Tyco RFID solutions and connects to Tyco's Loss Prevention and Inventory Reporting platforms, TrueVUE and Shrink Management as a Service (SMaaS). The IDX-4000 also supports industry standard Low Level Reader Protocol (LLRP) for directly managed RFID reader control. The IDX-4000 UHF RFID reader delivers real-time tag data when processing Gen2-compliant tags.

Order the IDX-4000 UHF RFID reader using the following part numbers:

- **IDX-4000-N1:** For use in North America. This kit includes a universal power supply with a US power cord, and a USB cable.
- **IDX-4000-E1:** For use in the EU. This kit includes a USB cable and a universal power supply. You must order a power cord separately.
- **IDX-4000-W1:** For a list of countries that use the W1 part number, see **Table 5**. This kit includes a USB cable and a universal power supply. You must order a power cord separately.
- **IDX-4000-W2:** For the list a list of countries that use the W2 part number, see **Table 5**. This kit includes a USB cable and a universal power supply. You must order a power cord separately.

RF connections

For information on the Radio Frequency (RF) connections and the power input connector on the IDX-4000 UHF RDIF reader, see **Figure 1** and **Table 1**.

To connect an antenna to the reader, complete the following steps:

Important: For the readers to automatically detect the antennas, the antennas must have 10kΩ resistance sensed at the RF port.

1. Using a screw-on RP-SMA connector, connect the antenna cable to an available RF output port.
2. Tighten the SMA connector using an SMA torque wrench to 1 newton-meter or 8-pound inch to secure the reader. A loose connection can compromise the performance of the reader.

   Important: Do not over tighten the SMA connector. Overtightening the connector causes permanent damage on the reader and the cable.

Figure 1. RF connectors and power input connectors on the reader

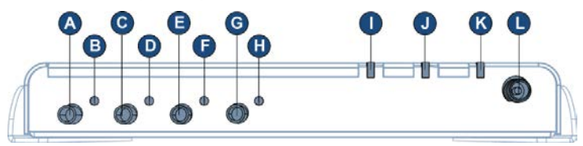


Table 1. RF connectors and power input connector descriptions

A	RF4 – RF port 4	**G**	RF1 – RF port 1
B	RF4 status LED	**H**	RF1 status LED
C	RF3 – RF port 3	**I**	Tag LED
D	RF3 status LED	**J**	Status LED
E	RF2 – RF port 2	**K**	Power LED
F	RF2 status LED	**L**	24 VDC coaxial power input connector **Note:** Connect the power supply provided with the reader. The power consumption is 24W maximum

Connections

For information on the connections on the IDX-4000 UHF RFID reader, see **Figure 2** and **Table 2**.

Figure 2. Digital end panel connectors

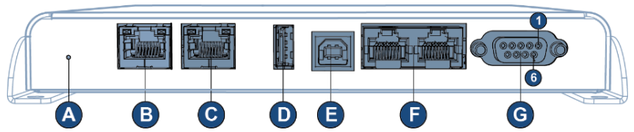


Table 2. Digital end panel connector descriptions

Letter	Port name	Description
A	Configuration access switch	Use a thin object such as a straightened paper clip to press the recessed configuration access switch to restore the reader to a factory default configuration file. To restore the reader to a factory default configuration file, press and hold the switch for 10 seconds until the Status LED turns green, and then release the switch. Within 10 seconds, press and release the switch again to confirm the update. The LED turns off, the default settings load, and the reader reboots.
B	Ethernet 2 / Power over Ethernet (PoE) port	Use this port to connect the reader to an Ethernet network or a local PC using an Ethernet cable with a RJ-45 connector. The port acts like a network switch, and uses Auto-MDIX to automatically negotiate the highest possible data rate. Optionally, this port accepts PoE connections to power the reader. You must use an Ethernet switch that provides PoE or a PoE injector to provide the power. The reader supports the following PoE standards: • IEEE 802.3af: Limits reader RF power to a maximum of 27dBm. • IEEE 802.3at: Provides full reader functionality including reader RF power to a maximum of 30dBm. **Important:** The reader does not allow the USB and the GPIO ports to draw current when it connects to an 802.3af supply.
C	Ethernet 1 port	Use this port to connect the reader to an Ethernet network or a local PC using an Ethernet cable with a RJ-45 connector. The Ethernet 1 port (C) and the Ethernet 2 port (B) are connected to an Ethernet Layer 2 switch.
D	USB A host port	This USB host port supports USB, type A connector, peripherals, for example, a portable USB memory device.
E	USB B device port	This USB device port supports USB, type B connectors. The port implements Ethernet over USB utilizing the Remote Network Driver Interface (RNDIS). Most versions of Microsoft® Windows®, Linux®, and FreeBSD® support RNDIS. Connecting the reader to a PC using this port creates a 2-node private Ethernet network that you can use to control and configure the reader.
F	RS-485 port	Use this port and its two connectors to connect to the peripheral or host RS-485 busses on Sensormatic products. This enables the reader to share data with the connected systems. The RS-485 connectors use RJ-45 plugs. Do not force the connectors into the reader when connecting the cables. If the IDX-4000 reader is considered the primary RS-485 controller on the network, a termination enable plug (TEP) is required in the second RS-485 port. **Important:** Do not connect Ethernet cables to this port.
G	GPIO / RS-232 port	Use this port to connect the reader to a peripheral device such as a relay or indicator. Use a female DE-9 connector to connect to this port. This port is also used for RS-232 communications for specialized applications.

Accessing the reader

To access the reader's web browser interface using the Ethernet 2 / Power over Ethernet (PoE), Ethernet 1, or USB B device ports, complete the following steps:

1. Connect your laptop to the reader using the necessary port on the reader.
2. Launch a web browser, and enter one of the following default IP addresses:
   - For Ethernet 2 / Power over Ethernet (PoE) or Ethernet 1 port connections, enter `192.168.100.100 / 24`
   - For USB B device port connections, enter `192.168.169.1`

   Note: Download device drivers from https://sensormaticsecurelogin.com.
3. In the **Login** window, enter the following log on credentials:
   - Username: `admin`
   - Password: `USBB24`

LED definitions

For information on the IDX-4000 UHF RFID reader LED definitions, see **Table 3**. For the location of the LEDs on the reader, see **Figure 1**.

Table 3. Reader LED definitions

LED	LED state	Description
Power	Solid green	The power is on and the unit is ready to use.
	Off	There is no power to the unit.
	Solid amber	The unit is powering on.
Status	Off	The reader is operational, and is not under LLRP management.
	Solid amber	When the power LED is amber, the unit is powering on. When the power LED is green, the unit is in power save mode.
	Blinking amber	Software is downloading to the reader.
	Solid green	The reader is under LLRP management. All other states take precedence. The reader may also be under LLRP management when another state is reported.
	Solid red	The reader is detecting an error or self-test has failed.
Tag	Flashing green	The reader is reading a valid tag.
	Flashing amber	The reader is reading a reading a tag but is discarding it because the Received Signal Strength Indication (RSSI) is below the programmed threshold.
	Flashing red	You must set the country of operation. The reader does not emit RF or read tags until you specify the country of operation.
RF Status	Amber	The transmitter is active.
	Off	The transmitter is not active.
	Three amber blinks	The reader has established communication with a 1-Wire® device.
	Two amber blinks	The reader has lost communication with a 1-Wire® device.

Mounting the reader

To mount the IDX-4000 UHF RFID reader on a surface, complete the following steps:

CAUTION: Observe the minimum bend radius specified for the associated antenna cable when the cable must change direction. A crushed or kinked antenna cable may impair reader performance.

1. Locate an area to mount the reader, and position the reader on the surface.

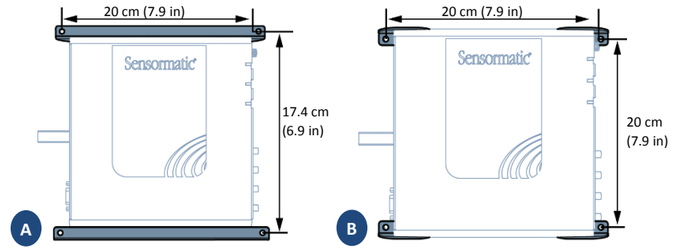
   Note: An ideal mounting surface can continuously conduct heat away from the reader case.
2. Ensure a minimum clearance of 10 centimeters (4 inches) of space around all exposed reader surfaces for ventilation.
3. Determine the correct mounting bracket orientation for the installation site. If necessary, change the orientation of the mounting bracket by completing the following steps:

   Note: Use the bracket-in orientation in space constrained environments. Use the bracket-out orientation when you need to conduct heat away from the reader. For the mounting bracket orientations, see **Figure 3**.

   a. Use a Phillips screwdriver to remove the screws that attach the brackets to the reader.
   b. Reverse the brackets, and then reinsert the screws.
   c. Tighten the screws to secure the bracket in place.
4. Use the mounting bracket as a template and mark the mounting holes on the surface.
5. Remove the reader, and at the locations that you marked, drill four mounting holes.
6. Position the reader over the four mounting holes, and secure the reader using fasteners appropriate for its 0.5 kilogram (1.1 pound) weight, the mounting surface, and any other present conditions, for example, vibration.

   Note: You can use M4 (#8) fasteners, or similar screws.

Figure 3. Mounting bracket orientations



A	Brackets-in orientation on reader
B	Brackets-out orientation on reader

Specifications

Power supply

Use only the Sensormatic power supply provided with the unit. **Table 4** describes the power supply that is shipped with the reader.

Other power supplies approved by and obtained from Sensormatic for use with this product are IEEE 802.3at or IEEE 802.3af PoE rated injectors with a maximum RF power of 32dBm.

Table 4. Power supply part numbers

Part number	Description
5606-0091-01	Universal power supply, 24Vdc, 1.7A, 40W
	Power cords
0352-0460-01	NA: 125 V, US, 1-15/C7, 2 m (6 ft)
0352-0460-02	EU: 250 V, CEE7/16-C7, ungrounded Euro plug, 2 m (6 ft)
0352-0460-03	UK: 250 V, BS1363-C7, ungrounded UK plug, 2 m (6 ft)
0352-0460-04	Japan: 125 V, 2.5 A, Japan-IEC, 2 m (6 ft)
0352-0460-07	Australia: 250 V, AS3112-C7, 2 m (6 ft)
0352-0460-09	China: 250 V, 2.5 A, China-IEC, 2 m (6 ft)

Environmental

Operating temperature .....-20 °C to 50°C (-4 °F to 122 °F)
Storage temperature..... -20 °C to 85 °C (-4 °F to 185 °F)
Relative humidity..... 5 to 95 %, non-condensing

Regulatory information

Radio

Frequency and power of operation

If frequency and power is selectable for your model, select only the country in which you are using the device. Any other selection makes the operation of this device illegal.

Note: The radio is enabled by default for NA models and some EU countries. For a list of applicable EU default countries, see **Table 5**. The radio is disabled for the W1 and W2 models, until you specify the country of operation in the country field on the RFID Settings page.

Table 5. Frequency and power of operation

Country	IDX part number	Model	Band (MHz)	Power	Approved
European Union*	IDX-4000-E1	IDX-4000-EU / IDX8KE	865.6-867.6	2 W erp	Yes
Albania	IDX-4000-E1	IDX-4000-EU / IDX8KE	865.6-867.6	2 W erp	Yes
Algeria	IDX-4000-W1	IDX-4000-W1 / IDX8K1	915-921, 925-926	100 mW eirp	Yes
Argentina	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Armenia	IDX-4000-E1	IDX-4000-EU / IDX8KE	866-868	2 W erp	Yes
Belarus	IDX-4000-E1	IDX-4000-EU / IDX8KE			Yes
Canada	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Chile	IDX-4000-W2	IDX-4000-W2 / IDX8K2	915-928	100 mW erp	Yes
China	IDX-4000-W1	IDX-4000-W1 / IDX8K1	920.5-925.5	2 W erp	Yes
Colombia	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Costa Rica	IDX-4000-E1	IDX-4000-EU / IDX8KE	865-868	250 mW eirp	Yes
Dominican Republic	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Ecuador	IDX-4000-N1	IDX-4000-NA / IDX8K2	902-928	500 mW	Yes
Egypt	IDX-4000-E1	IDX-4000-EU / IDX8KE	865-868	100 mW erp	Yes
El Salvador	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Guatemala	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Honduras	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	250 mW eirp	Yes
India	IDX-4000-E1	IDX-4000-EU / IDX8KE	865-867	4 W eirp	Yes
Indonesia	IDX-4000-W2	IDX-4000-W2 / IDX8K2	923-925	2 W erp	Yes
Japan	IDX-4000-W1	IDX-4000-W1 / IDX8K1	916.8-920.8	4 W eirp	Yes
Jordan	IDX-4000-E1	IDX-4000-EU / IDX8KE	865-868	2 W eirp	Yes
Kuwait	IDX-4000-E1	IDX-4000-EU / IDX8KE	865-868	100 mW erp	Yes
Lebanon	IDX-4000-E1	IDX-4000-EU / IDX8KE	865.6-867.6	100 mW erp	Yes
Mexico	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Morocco	IDX-4000-E1	IDX-4000-EU / IDX8KE	867.7-868	500 mW erp	Yes
Oman	IDX-4000-E1	IDX-4000-EU / IDX8KE	865.6-867.6	2 W erp	Yes
Panama	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Paraguay	IDX-4000-N1	IDX-4000-NA / IDX8KN	918-928		Pending
Qatar	IDX-4000-E1	IDX-4000-EU / IDX8KE	865.6-867.6	2 W erp	Yes
Russia	IDX-4000-E1	IDX-4000-EU / IDX8KE	866-867.6	2 W erp	Yes
Thailand	IDX-4000-W2	IDX-4000-W2 / IDX8K2	920-925	4 W eirp	Yes
Tunisia	IDX-4000-E1	IDX-4000-EU / IDX8KE	865.6-867.6	2 W erp	Yes
Ukraine					No
United Arab Emirates	IDX-4000-E1	IDX-4000-EU / IDX8KE	865-867	100 mW erp	Yes
United States	IDX-4000-N1	IDX-4000-NA / IDX8KN	902-928	4 W eirp	Yes
Uruguay	IDX-4000-W2	IDX-4000-W2 / IDX8K2	915-928	1 W eirp	Yes

*For default purposes, the European Union includes the countries listed in **Table 6**.

Table 6. United Kingdom and European Union countries

Albania	Denmark	Iceland	Malta	Serbia
Andorra	Estonia	Ireland	Monaco	Slovakia
Austria	Finland	Italy	Montenegro	Slovenia
Belgium	France	Kazakhstan	Netherlands	South Africa
Bosnia and Herzegovina	Georgia	Latvia	Norway	Spain
Bulgaria	Germany	Lithuania	Poland	Sweden
Czech Republic	Greece	Luxembourg	Portugal	Switzerland
Croatia	Hong Kong	Macao	Romania	Turkey
Cyprus	Hungary	Macedonia	Saudi Arabia	United Kingdom

Approved antennas

Table 7 lists the antennas that are approved for use with the IDX-4000 UHF RFID reader.

Table 7. Approved antennas

Manufacturer	Part number	Polarization	Composite Gain
Sensormatic*	IDA-1000-US-RS / IDA-1000-EU-RS	RHCP	3.3dBiL
Sensormatic*	IDA-3100-EU-RS / IDA-3100-NA-RS	RHCP	6.0dBiL
Sensormatic*	IDA-3200-EU-RS / IDA-3200-NA-RS	RHCP	6.0dBiL
Sensormatic*	IDKM-1000 / IDKM-1010	Near field	-13.0dBiL
Sensormatic*	IDSM-1000 / IDSM-1100	RHCP	6.0dBiL
Motorola (Symbol)*	AN480-CL66100WR	LHCP	6.0dBiL
Motorola (Symbol)*	AN480-CR66100WR	RHCP	6.0dBiL
Motorola (Symbol)*	AN610-XXXXXXXXX	RHCP	6.0dBiL

* Required antenna impedance is 50 ohms

The IDKM-1000 and the IDKM-1010 antennas are not approved for use in the countries listed in **Table 8**.

Table 8. Countries not approved for the use of the IDKM-1000 and the IDKM-1010 antennas

Algeria	Kuwait
Chile	Lebanon
Costa Rica	United Arab Emirates
Egypt	-

The IDA-3100, IDSM-1000, and IDSM-1100 antennas are not approved for use in Russia and South Korea.

Table 9 lists the countries that are restricted to low power.

Table 9. Countries restricted to low power

Ecuador	Morocco
Honduras	Uruguay

Note: All other countries listed in **Table 5. Frequency and power of operation** can use any of the approved antennas listed in **Table 7**.

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.

This radio transmitter (3506A-IDX4000NA) has been approved by Industry Canada to operate with the antenna types listed in **Table 7** 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.

Le présent émetteur radio (3506A-IDX4000NA) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés en **Table 7** 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.

Antenna Installation

The antennas used with this transmitter must be installed to provide a minimum separation distance of 38 centimeters or 14.9 inches from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter.

FCC Maximum Permissible Exposure (MPE) guidelines require the antenna's surface to be at least 25 centimeters away from personnel working in the area.

Industry Canada (IC) Maximum Permissible Exposure Guidelines require the antenna's surface to be at least 34 centimeters from personnel working in the area.

FCC ID: BVCUHIDX1801

Regulatory Model: UHIDX1801

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.

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, and/or consult the dealer or an experienced radio/TV technician for help.

For the State of California, U.S.A. only: Perchlorate Material - Special Handling May Apply.
See http://www.dtsc.ca.gov/hazardouswaste/perchlorate.
This product includes a real-time clock battery or coin cell battery that may contain perchlorate and may require special handling when recycled or disposed of in California.

IC ID: 3506A-UHIDX1801, **MODEL:** IDX-4000-NA

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.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

México NOM 121: IDX4KN

La operación de este equipo está sujeta a las siguientes dos condiciones:

1) es posible que este equipo o dispositivo no cause interferencia perjudicial y
2) este equipo debe aceptar cualquier interferencia, incluyendo la que pueda causar su propia operación no deseada.

EMC	47 CFR, Part 15	IDX-4000-NA, IDX8KN
	ICES-003	IDX-4000-NA, IDX8KN
	RSS-210	IDX-4000-NA, IDX8KN
	NOM 121	IDX-4000-NA, IDX8KN
	EN 302 208	IDX-4000-EU, IDX8KE
	EN 301 489	IDX-4000-EU, IDX8KE
Safety	UL/EN 60950-1	UHIDX1801
	CSA-C22.2.60950-1	UHIDX1801

CE

Equipment Modification Caution

Equipment changes or modifications not expressly approved by Sensormatic Electronics, LLC, the party responsible for FCC compliance, could void the user's authority to operate the equipment and could create a hazardous condition.

Restriction of Hazardous Substances Directive (RoHS)

All parts and components are manufactured in accordance to and to be compliant with the "DIRECTIVE 2002/95/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment."

Service

If a problem using the equipment occurs, contact the facility Technical or Systems Support. If there is a problem with the equipment, contact Sensormatic Technical Support at http://sensormaticsecurelogin.com.

For EU customers: All products at the end of their life must be returned to Sensormatic for recycling. For information on how to return the product, visit: http://sensormatic.com/WhoWeAre/Eco-Initiatives.aspx.

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http://www.sensormatic.com
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Sensormatic®