# **ENVIRONMENTAL PRODUCT DECLARATION**

as per ISO 14025 and EN 15804

Owner of the Declaration ASSA ABLOY (HID Global)

Programme holder Institut Bauen und Umwelt e.V. (IBU)

Publisher Institut Bauen und Umwelt e.V. (IBU)

Declaration number EPD-ASA-20150216-IBA1-EN

Issue date 17.08.2015
Valid to 16.08.2020

# Access control systems – iCLASS SE R10 ASSA ABLOY / HID Global



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# 1. General Information

# **HID Global**

# Programme holder

IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany

#### **Declaration number**

EPD-ASA-20150216-IBA1-EN

# This Declaration is based on the Product Category Rules:

Electronic Access Control Systems, 11-2013 (PCR tested and approved by the independent expert committee (SVR))

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# Issue date

17.08.2015

#### Valid to

16.08.2020

Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)

Dr.-Ing. Burkhart Lehmann (Managing Director IBU)

# **iCLASS SE R10**

# **Owner of the Declaration**

ASSA ABLOY (HID Global) 611 Center Ridge Drive Austin, TX 78753 USA

# **Declared product / Declared unit**

This Declaration represents 1 card reader model iCLASS SE R10, with pigtail, including all custom configurations.

# Scope:

The Life Cycle Assessment is based on data collected by the contract manufacturer of the R10 at their production facility located in the Philippines.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

# Verification

The CEN Standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025

internall

externally



Dr. Wolfram Trinius
(Independent verifier appointed by SVR)

# 2. Product

# 2.1 Product description

The iCLASS SE R10 reader, produced by HID Global, an ASSA ABLOY Group brand, is a device that communicates with a personalized credential via RF technology.

The reader collects identity information from the credential and passes it along to a secured control unit via electrical cable. The control unit then grants or denies access to the credential holder. The reader is capable of communications using a high frequency RF signal and able to communicate with several credential formats. Also factory settings can be updated to various configurations allowing the reader flexibility in its function.

Supported credential formats:

- iCLASS SE (Cards/Tags/Fobs)
- SE for DESFire EV1 (Cards)
- SE for MIFARE Classic (Cards/Tags/Fobs)

# Configurable functions:

- LED function
- Audible signal (Beep)
- Communication format
- Optical Tamper

# 2.2 Application

The iCLASS SE R10 reader is suitable for indoor and outdoor use, where ID authentication is required. Common applications include: Commercial buildings, Industrial buildings, Government buildings, Military installations, Education establishments, Healthcare buildings.

# 2.3 Technical Data

The table presents the technical properties of iCLASS SE R10 reader:

# **Technical data**

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Parameter	Value	Unit
Mounting	Mini-Mullion Size	-
Power supply	5-16VDC	V
Current Requirements	95mA	Α
Operating Temperature	-35 to 65	°C
Operating Humidity	5% to 95%	%
Transmit Frequency	13.56MHz	kHz
Power Input "Standby"	0.96	W
Power Input "Operation"	1.52	W



# 2.4 Placing on the market / Application rules

# Compliance with US, Canada, and CB Scheme Safety:

- UL294-The Standard of Safety for Access Control System Units
- C22.2 No. 205 Signal Equipment
- CB Certificate US-21166-UL

# Compliance with US and Canada Unlicensed Radios:

- US FCC Radio Certification 47 CFR Part 15, Subpart C
- Canada Radio Certification RSS-210 Issue 8: 2010

# Compliance with the European Union R&TTE Directive:

The products are subject to CE marking according to the relevant harmonization legislation. Affixing the CE marking to the products means the compliance of the product with the a. m. Directive.

The following standards apply:

- EN 60950-1: 2006/ All: 2009 +A1:2010 +A12:2011 Information technology equipment Safety Part1: General requirements
- EN 301 489-1 V1.9.2 Common Technical Requirements
- EN 301 489-3 V1.6.1 Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz
- EN 50130-4:2011 Alarm systems Electromagnetic Compatibility and Environmental test methods
- ETSI EN 300 330-2 V1.5.1 Electromagnetic Compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

# **Compliance with the RoHS2 Directive**

The products are subject to CE marking according to the relevant harmonization legislation. Affixing the CE marking to the products means the compliance of the product with the a. m. Directive.

The following standard applies:

EN 50581:2012 – RoHS2 Conformity

# 2.5 Delivery status

Each reader unit is delivered individually packaged with mounting plate, and mounting hardware. Packaged reader dimensions:  $1.9" \times 4.1" \times 0.9"$  (4.8cm x 10.3cm x 2.3cm).

# 2.6 Base materials / Ancillary materials

The average composition of iCLASS SE R10 reader is as follows:

Component	Percentage in mass (%)
Plastics	48.3
Stainless Steel	5.9
Glass	9.0
Electronics	22.9
El-mech (cables)	13.9

Component	Percentage in mass (%)
Total	100.0

#### 2.7 Manufacture

The iCLASS SE R10 is assembled at a contract manufacturer's production facility in the Philippines. The injection molded parts are purchased from an external supplier. The electronic components, including PCB, are purchased externally and assembled at the contract manufacturer's production facility. During final assembly the individual parts are assembled into the reader bezel and then potted into place. The assembled reader is then packaged with the mounting plate and hardware for shipment.

# 2.8 Environment and health during manufacturing

The Management System of the contract manufacturer has been assessed and certified as meeting the requirements of ISO 14001:2004 standard. In addition, industrial safety is certified as compliant to OHSAS 18001 standard.

# 2.9 Product processing/Installation

iCLASS SE R10 reader are installed by trained product integrators or by the product end user. Installation instructions are included with each reader unit.

# 2.10 Packaging

The reader is packed in a cardboard box. Also included in the packaging are paper installation instructions, and a plastic bag containing the connectors and mounting hardware. Packaging materials shall be collected separately for recycling.

Material	Value (%)
Cardboard/ Paper	98.02
Plastics	1.98
Total	100.0

# 2.11 Condition of use

No auxiliary or consumable materials are incurred for maintenance and usage of the reader. Repairs or replacement are not usually necessary. No cleaning efforts need to be taken into consideration.

# 2.12 Environment and health during use

There are no interactions between products, the environment and health.

# 2.13 Reference service life

The service life of the iCLASS SE R10 reader is estimated to be 30 years. This number is based on the most conservative Mean Time Between Failure (MTBF) data available for the reader components at elevated operation temperatures. MTBF of 270110 hours at 65°C.

# 2.14 Extraordinary effects Fire

The external housing of the R10, consisting of the bezel and mounting plate, are constructed from polycarbonate resin thermoplastic. The housing material, and thus the reader as a whole unit, has been classified as having a UL94 HB Flame Rating. A UL94 Flame Rating of HB indicates: slow burning on a horizontal specimen; burning rate < 76 mm/min for thickness < 3 mm and burning stops before 100 mm.



#### Water

No substances are used on the device, which could have a negative impact on ecological water quality on contact with water.

# **Mechanical destruction**

No danger to the environment can be anticipated during mechanical destruction.

# 2.15 Re-use stage

The following possibilities arise with reference to the material composition of the reader.

Re-use

During the reference service life, the reader can be disconnected and dismounted then remounted and attached elsewhere.

# Material Recycling

The card reader can be recycled according to local electronics recycling options offered by municipalities, electronics recyclers or garbage haulers.

# 2.16 Disposal

Packaging

Packaging components incurred during installation are directed to local paper and cardboard recyclers. The product can be mechanically dissembled to separate different materials. For this, collection rate of 5% was assumed. The rest is disposed as a construction waste for landfill.

#### 2.17 Further information

More information on ASSA ABLOY (HID Global) and iCLASS SE readers is available by:

ASSA ABLOY (HID Global) 611 Center Ridge Drive Austin, TX 78753 USA

Tel: 512-776-9000

Internet: www.hidglobal.com

# 3. LCA: Calculation rules

#### 3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of iCLASS SE R10 reader as specified in Part B requirements on the EPD for Electronic Access Control Systems /IBU PCR Part B/.

# **Declared unit**

Name	Value	Unit
Declared unit	1	piece of iCLASS SE R10
Mass (without packaging)	0.14	kg
Conversion factor to 1 kg	6.45	-

# 3.2 System boundary

Type of the EPD: cradle to gate - with options The following life cycle stages were considered: Production stage:

- A1 Raw material extraction and processing
- A2 Transport to the manufacturer and
- A3 Manufacturing

# Construction stage:

- A4 Transport from the gate to the site
- A5 Packaging waste processing

Use stage related to the operation of the building includes:

 B6 – Operational energy use (Energy consumption for lock operation)

# End-of-life stage:

- C2 Transport to waste processing,
- C3 Waste processing for recycling and
- C4 Disposal (landfill).

These information modules include provision and transport of all materials, products, as well as energy and water provisions, waste processing up to the end-of-waste state or disposal of final residues.

Module D:

 Declaration of all benefits or recycling potential from EoL and A5

# 3.3 Estimates and assumptions

# Use stage:

For the use stage, it is assumed that the iCLASS SE R10 reader is used in the United States of America, thus an US electricity grid mix is considered within this stage.

# EoL:

In the End-of-Life stage of the product, a recycling scenario with a 5% collection rate was assumed. For packaging material a 100% collection rate was assumed.

# 3.4 Cut-off criteria

In the assessment, all available data from the production process are considered, i.e. all raw materials used, auxiliary materials (e.g. lubricants), thermal energy consumption and electric power consumption - including material and energy flows contributing less than 1% of mass or energy (if available). In case a specific flow contributing less than 1% in mass or energy is not available, worst case assumption proxies are selected to represent the respective environmental impacts.

Impacts relating to the production of machines and facilities required during production are out of the scope of this assessment.

# 3.5 Background data

For life cycle modeling of the considered products, the GaBi 6 Software System for Life Cycle Engineering, developed by thinkstep AG, is used /GaBi 6 2013/. The GaBi-database contains consistent and documented datasets which are documented in the online GaBi-documentation /GaBi 6 2013D/. To ensure comparability of results in the LCA, the basic data of GaBi database were used for energy, transportation and auxiliary materials.



# 3.6 Data quality

The requirements for data quality and background data correspond to the specifications of the /IBU PCR PART A/.

thinkstep AG performed a variety of tests and validations during the commission of the present study in order to ensure its quality of the present document and results. This obviously includes an extensive review of project-specific LCA models as well as the background data used.

The technological background of the collected data reflects the physical reality of the declared products. The datasets are complete and conform to the system boundaries and the criteria for the exclusion of inputs and outputs.

All relevant background datasets are taken from the GaBi 6 software database. The last revision of the used background data has taken place not longer than 10 years ago.

# 3.7 Period under review

The period under review is 2013/14 (12 month average).

# 3.8 Allocation

Regarding incineration, the software model for the waste incineration plant (WIP) is adapted according to the material composition and heating value of the combusted material. Following specific life cycle inventories for the WIP are considered:

- Waste incineration of plastic
- Waste incineration of paper
- Waste incineration of electronic scrap.

Regarding the recycling material of metals, the metal parts in the EoL are declared as end-of-waste status. Thus, these materials are considered in module D. Specific information on allocation within the background data is given in the GaBi dataset documentation.

# 3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

# 4. LCA: Scenarios and additional technical information

Installation into the building (A5)

Name	Value	Unit
Output substances following waste treatment on site (Paper packaging)	0.064	kg
Output substances following waste treatment on site (Plastic packaging)	0.0013	kg

Thermal treatment (plastics)	1.66	%
Loss Construction waste for landfilling (no recycling potential)	65.53	%
Reuse packaging (paper)	30.73	%
Reuse packaging (plastics)	0.62	%

# Reference service life

Name	Value	Unit
Reference service life	30	а

Operational energy use (B6)

operational energy use (Bo)		
Name	Value	Unit
Electricity consumption	241.78	kWh
Years of use	30	Years
Days per year in use	365	Days
Hours per day in on mode	1	h
Hours per day in stand-by mode	23	h
Power consumption on mode	1.52	W
Power consumption stand-by mode	0.96	W

End of life (C2-C4)

Name	Value	Unit
Collected separately plastics, stainless steel, electronics	0.0065	kg
Collected as mixed construction waste for landfilling	0.1374	kg
Reuse plastic parts	0.0035	kg
Recycling stainless steel, electronics	0.0031	kg
Landfilling - Construction waste for landfill	0.1374	kg

# Reuse, recovery and/or recycling potentials (D), relevant scenario information

Name	Value	Unit
Collected separately waste Card reader (including packaging)	0.2096	kg
Recycling stainless steel	0.20	%
Recycling electronics	1.26	%



# 5. LCA: Results

Results shown below were calculated using CML 2000 – Apr. 2013 Methodology.

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PER PERI PENI PENI PENI SM RSI NRS	RE RE RRM RT RE RT M M M M M M M M M M M M M M M M M M	Rene resource Total use of re Use of n Use of TH	wable printended and the printen	neter nary ene carrier imary er terial uti ewable p esources rimary er carrier rimary er utilization enewable esources dary mat eseconda vable seels iresh wat	rgy as lergy lization orimary nergy as nergy as e primar erial ary fuels condary ter	Un [M.	it A  J] 5.2  J] 0.0  J] 5.2  J] 7.0  J] 7.0  J] 7.0  J] 0.0  J] 0.0  J] 0.0  J] 0.0  J] 2.5	11 - A3 44E+(	3 A4 30 - 500 - 500 1.31E- 500 - 500 - 500 - 500 - 500 - 500 0.00E- 500 0.00E- 500 0.00E- 501 1.14E-	-02 2.38E -02 3.00E -00 0.00E -00 0.00E -00 2.65E	-03 1 1 -02 2 2 +00 0 0 +00 0 0 +00 DRIE	B696E+053E+0. 0.00E+0 0.00E+0 0.00E+0	C2 2 2.72E-0 - 3 6.91E-0 0 0.00E+0 0 0.00E+0 1 1.92E-0	7.93E-C  -  3.4.34E-C  0.00E+C  0.00E+C  1.96E-C	3 6.82E 	=-02 =+00 =+00 =-04	- -5.03E-01 - -9.54E+00 0.00E+00 0.00E+00 0.00E+00 -6.42E-03
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PER PENI PENI PENI SM RSI NRS FW RESU reade	RE R	Rene resource Total use Non rene Non rene Total use Use of re Use of n  Use The total use Hazardo	wable printenergy wable printenergy researches as masses of renergy rewable penergy rewable penergy report of secondary researches as a secondary re	neter nary ene carrier imary ene carrier aterial uti ewable p sources rimary er carrier rimary er carr	rgy as lergy lization orimary nergy as nergy as e primary erial ary fuels condary ter TPUT	Image of the second of the sec	it A  J] 5.2  J] 0.0  J] 5.2  J] 7.0  O.0  J] 7.0  J] 0.0  J] 0.0  J] 0.0  J] 0.0  VS AN	11 - A3 44E+(C) 00E+(C) 44E+(C) 00E	3 A4 30 - 500 - 500 1.31E- 501 - 500 - 501 7.68E- 502 0.00E- 500 0.00E- 500 0.00E- 501 1.14E- 502 A4	-02 2.38E -02 2.38E -01 3.00E -00 0.00E -00 0.00E -00 0.00E -00 0.00E -05 2.65E  CATEGO A5	-03 1 1 -02 2 2 +00 0 0 +00 0 0 0 E E E E 1.97	B696E+053E+0 0.00E+0 0.00E+0 0.00E+0 7E-03	C2	4 7.93E-0 - 3 4.34E-0 0 0.00E+0 0 0.00E+0 7 1.96E-0 C3	3 6.821 	=-03 =-02 =+00 =+00 =-04 = R1	- -5.03E-01 - -9.54E+00 0.00E+00 0.00E+00 0.00E+00 -6.42E-03
PER PENI PENI PENI SM RSI NRS FW RESU reade Param	RE RE RR RR RT M M M M M M M M M M M M M M M	Rene resource Total use Non rene Non rene Total use Use of re Use of n  Use The total use Hazardo	wable printenergy wable printenergy researches as masse of renergy researches as masse of renergy researches as masse of renergy researches as a masse of renergy renergy researches as a masse of renergy researches as a masse of renergy rene	neter nary ene carrier imary ene carrier imary ene aterial uti ewable p sources rimary er carrier rimary en titilization enewable esources dary mat escond: vable see els fresh waf  ter e dispose s waste d	rgy as lergy lization primary nergy as lergy as	Image of the second of the sec	it A  J] 5.2  J] 0.0  J] 7.0  J] 7.0  J] 7.0  J] 0.0  J] 0.0  J] 0.0  VS AN  A1 - A3  3.23E-0	11 - A3 44E+(C 00E+(C 0	A4  A4  A4  A4  A4  A22E-06	-02 2.38E -01 3.00E -00 0.00E -00 0.00E -00 2.65E	-03 1 1 -03 1 -0	B696E+096E+0. 0.00E+0 0.00E+0 0.00E+0 0.00E+0 7E-03	C2		3 6.821 	=-02 =+00 =+00 =+00 =-04 = R1	- -5.03E-01 - -9.54E+00 0.00E+00 0.00E+00 0.00E+00 -6.42E-03
PER PERI PENI PENI PENI SM RSI NRS FW RESU reade Param	RE R	Rene resource Total use Non rene Use of re Use of n  Hazardo Non h	wable printenergy wable printenergy researches as masse of renergy researches as masse of renergy researches as masse of renergy researches as a masse of renergy renergy researches as a masse of renergy researches as a masse of renergy rene	neter nary ene carrier imary ene terial uti ewable p sources rimary ene utilization enewable sources dary mat e second wable seels iresh wat e dispose s waste d e dispose	rgy as lergy lization primary nergy as le primary erial ary fuels condary ter TPUT Led [	Image of the second of the sec	it A  J] 5.2  J] 0.0  J] 5.2  J] 7.0  J] 7.0  J] 0.0  J] 0.0	11 - A3 44E+(C 00E+(C 00E+(C)(C)(C)(C)(C)(C)	A4  A4  A5TE  A4  A4  A5TE  A4  A5TE  A6  A6  A6  A7  A7	A5 -02 2.38E -02 2.38E -01 3.00E -00 0.00E -00 0.00E -00 0.00E -00 2.65E  CATEGO  A5 -2.06E-06 -2.29E-03	-03 1 102 2 2 +-00 0 0 +-00 0 004 8 DRIE 1.97 8.09 2.09	B696E+053E+0 0.00E+0 0.00E+0 0.00E+0 7E-03 9E-01	C2	- 4 7.93E-0 - 3 4.34E-0 0 0.00E+0 0 0.00E+0 0 0.00E+0 7 1.96E-0 6 of iCL/ C3 6.02E-06 1.40E-05	3 6.82f 	=-02 =+00 =+00 =-04 =-06 06 02	
PER PENI PENI PENI RSI NRS FW RESU reade Param HWW NHW	RE R	Rene resource Total use Non rene Non rene Use of re Use of n  Hazardc Non h  Radioact	rable printer energy wable printer energy research and re	neter imary ene carrier imary ene carrier imary ene deterial util ewable p sources rimary en carrier r	rgy as lergy lization primary hergy as le primary erial ary fuels condary ter  TPUT  Led [ ed [ ed [	Image of the second of the sec	it A  J] 5.2  J] 0.0  J] 7.0  J] 7.0  J] 7.0  J] 0.0  J] 0.0	11 - A3 44E+(-00E	A4  00  - 00  - 00  1.31E- 01  - 00  - 01  7.68E- 02  0.00E- 00  0.00E- 00  0.00E- 02  1.14E-  A4  .22E-06  .09E-05  .68E-07	-02 2.38E -01 3.00E -00 0.00E -00 0.00E -00 2.65E  CATEGO  2.06E-06 2.29E-03 1.75E-06	-02 2 2 +00 0 0 +00 0 0 -04 8 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	B6	C2	7.93E-0 3.4.34E-0 0.00E+0 0.00E+0 0.00E+0 0.00E+0 1.96E-0 1.40E-05 6.25E-06	3 6.82E 2 9.71E 00 0.00E 00 0.00E 5 4.84E 7.61E 2.87E 4.00E	=-02 =+00 =+00 =-04 =-06 02 06 ++00	5.03E-015.03E-019.54E+00 0.00E+00 0.00E+00 -6.42E-03 10  D -1.88E-04 -3.27E-02 -2.50E-04
PER PERI PENI PENI PENI SM RSI NRS FW RESU reade Param HW NHV RW	RE RR R	Rene resource Total use Non rene Non rene Use of re Use of n  Hazardc Non h  Radioact	wable pring energy wable pressured in the pring wable pressured in the pre	neter nary ene carrier imary ene terial uti ewable p sources rimary ene utilization enewable sources dary mat e second wable see els iresh wal e e dispose ss waste d e dispose ecycling	rgy as lergy lization primary nergy as lergy as	Un	it A  J] 5.2  J] 0.0  J] 5.2  J] 7.0  J] 7.0  J] 0.0  J] 0.0	11 - A3 44E+C 00E+C 00E+	A4  00 -  00   -  00   1.31E-  01   -  00   -  01   7.68E-  02   0.00E-  00   0.00E-  02   1.14E-  A4  .22E-06  .09E-05  .68E-07  .00E+00	A5 -02 2.38E -02 2.38E -01 3.00E -00 0.00E -00 0.00E -00 0.00E -00 2.65E  CATEGO  A5 2.06E-06 2.29E-03 1.75E-06 0.00E+00	-03 1 102 2 2 +-00 0 0 +-00 0 004 8	B696E+096E+0. 0.00E+0	C2	4 7.93E-0	3 6.82E	=-02 =+00 =+00 =-04 =-06 06 02 06 ++00	
PER PERI PENI PENI PENI SM RSI NRS FW RESU reade Param HW NHW RW	RE RE RM RT M PER	Rene resource Total use Non rene Non rene Use of re Use of n  Hazardce Non h  Radioact Compe	wable pring energy wable pressured in the pring wable pressured in the pre	neter nary ene carrier imary ene terial uti ewable p sources rimary er carrier rimary er carrier rimary er carrier rimary er exertification enewable esources dary mat escond: vable see els resh wat e e dispose s waste d e dispose ecycling gy recov	rgy as lergy lization primary nergy as le primary erial ary fuels condary ter  TPUT  Led [ ed [ ed [ ed [ ery [ ergy   er	Image of the second of the sec	it A  J] 5.2  J] 0.0  J] 7.0  J] 7.0  J] 7.0  J] 0.0  J] 0.0	11 - A3 44E+(	A4  00 -  00   -  00   1.31E-  01   -  00   -  01   7.68E-  02   0.00E-  00   0.00E	A5 -02 2.38E -01 3.00E -00 0.00E -00 0.00E -00 2.65E  CATEGO  2.06E-06 2.29E-03 1.75E-06 0.00E+00 6.41E-02	-03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 1 -03 1 -03 1 1 -03	B6	C2	- 4 7.93E-0 - 3 4.34E-0 0 0.00E+0 0 0.00E+0 0 0.00E+0 0 1.96E-0 6.25E-06 0.00E+0 2.18E-02	3 6.82E 2 9.71E 00 0.00E 00 0.00E 5 4.84E 7.61E 2.87E 4.00E 0.00E- 0.00E- 0.00E-	=-03 =-02 =+00 =-04 =-04 =-06 02 06 02 +-00 ++00	



# 6. LCA: Interpretation

This chapter contains an interpretation of the Life Cycle Impact Assessment categories. Stated percentages in the whole interpretation are related to the overall life cycle, excluding credits (module D).

The production stage (modules A1-A3) contributes between 1% and 7% to the overall results for all the environmental impact assessment categories hereby considered, except for the abiotic depletion potential (ADPE), for which the contribution from the production stage accounts for app. 96% - this impact category describes the reduction of the global amount of nonrenewable raw materials, therefore, as expected, it is mainly related with the extraction of raw materials (A1).

Within the production stage, the main contribution for all the impact categories is the production of electronics mainly due to the energy consumption on these processes. Plastics account with about 48% to the overall mass of the product; therefore, the impacts

are not in line with the mass composition of the product. The environmental impacts for the transport (A2) have a negligible impact within this stage.

To reflect the use stage (module B6), the energy consumption was included and it has a major contribution for all the impact assessment categories considered - between 92% and 99%, with the exception of ADPE (4%). This is a result of 23 hours of operation in stand-by mode and 1 hour in on mode per day and per 365 days in a year.

In the end-of-life stage, there are loads and benefits (module D, negative values) considered. The benefits are considered beyond the system boundaries and are declared for the recycling potential of the metals and for the credits from the incineration process (energy substitution).

# 7. Requisite evidence

Not applicable in this EPD.

# 8. References

#### **Institut Bauen und Umwelt**

Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs);

# **General principles**

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013-04 www.bau-umwelt.de

# **IBU PCR Part A**

IBU PCR Part A: Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2013

www.bau-umwelt.de

# **IBU PCR Part B**

IBU PCR Part B: PCR Guidance-Texts for Building-Related Products and Services. From the range of Environmental Product Declarations of Institute Construction and Environment e.V. (IBU). Part B: Requirements on the EPD for Electronic Access Control Systems, 11-2013. www.bau-umwelt.com

# GaBi 6 2013

GaBi 6 2013: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Leinfelden-Echterdingen, 1992-2013.

# GaBi 6 2013D

GaBi 6 2013D: Documentation of GaBi 6: Software-System and Database for Life Cycle Engineering. Copyright, TM. Stuttgart, thinkstep AG, Leinfelden-Echterdingen, 1992-2013. http://documentation.gabisoftware.com

# ISO 14001

ISO 14001:2009-11: Environmental management systems - Requirements with guidance for use

# ISO 14025

ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

# **ISO 9001**

ISO 9001:2008: Quality management systems - Requirements

# EN 15804

EN 15804:2012+A1:2014: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

# **RoHS Conformity:**

RoHS Conformity: EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

# UL294/cUL

The Standard of Safety for Access Control System Units

# **UL94**

Flame Rating of HB

# EN60950



EN60950-1: 2006/ All: 2009 +A1:2010 +A12:2011 Information technology equipment - Safety - Part1: General requirements

# EN 301 489

EN 301 489-1 V1.9.2 : Common Technical requirements

EN 301 489-3 V1.6.1: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 40 GHz

#### EN50130

EN50130-4:2011 : Alarm systems - Electromagnetic compatibility and Environmental test methods

# **ETSI EN 300**

ETSI EN 300 330-2 V1.5.1 Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive

# **ETSI EN 302**

ETSI EN 302 291-2 V1.1.1 : Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices (SRD); Close Range Inductive Data Communication equipment operating at 13,56 MHz; Part 2: Harmonized EN under article 3.2 of the R&TTE Directive

# EN 50581

EN 50581: 2012 Guiding Standard for Compliance with RoHS2 Technical Documentation Requirements FCC Certification: 47 CFR §15.225: 2011 Operation within the band 13.110-14.010 MHz

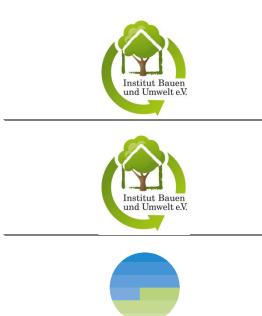
# **RSS-210**

RSS-210 Issue 8: 2010 License-exempt Radio Apparatus (All Frequency Bands): Category I Equipment - Spectrum Management and Telecommunications Radio Standards Specification

# 9. Annex

Results shown below were calculated using TRACI Methodology.

DESC	CRIP	TION C	F THE	SYST	ЕМ В	OUND	ARY (	X =	INCL	UDE	O IN	LCA	; MNE	) =	MOD	ULE N	ОΤΙ	DECLA	RED)
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PROI	DUCT	STAGE	ON PROCESS			USE STAGE END OF L													OADS OND THE
		017102	STAGE								END OF LIFE STAGE					YSTEM			
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			the			-		1)	£	7   7	તે ત	ter	٦			ing			
Raw material supply	٦	Manufacturing	om e sit	<u>&gt;</u>		Maintenance	L	Replacement <sup>1)</sup>	nen	וסו	ene	× ×	ıctic	o	동	ess	ਭ	<u></u>	卢호교
w mate supply	dsı	actı	rt fro the	emk	Use	ena	Repair	em.	1 4		use	ional	stru		dsı	õ	soc	Reuse-	ove Aclir enti
w r	Transport	nœ	spol e to	Assembly	_	aint	Re	olac	1	5   E	5 0	atic	, lo	demolition	Transport	e p	Disposal	Re	Recovery. Recycling potential
Ra	_	Ma	Fransport from the gate to the site	1		Ž		Rei	Refurbishment <sup>1)</sup>		Operational energy use	Operational water use	De-construction	٥	'	Waste processing			ш. ш.
	•	<u>'</u>													-		24		
A1	A2	A3	A4	A5	B1	B2	B3	B4			B6	B7	C1		C2	C3	C4		D
X	X	X	X	X	MND	MND	MND	MN		ND .	Х	MNE			X	Х	Х		Х
RESULTS						IRONMENT <i>A</i>			A4	ne pi		Of IC	LASS			reade	er 		
Param	eter	Parameter			Unit		A1 -	A1 - A3			A5		В6		C2	C3		C4	D
GW	Р	Global warming potential			[kg C	[kg CO <sub>2</sub> -Eq.]		4.80E+00		02 9.	9.12E-02		1.74E+02		9E-04	2.44E-0	)3 1.	96E-01	-8.09E-01
ODI	Р	Depletion potential of the stratospheric ozone layer			[kg CF	[kg CFC11-Eq.]		6.51E-10		13 4.	4.44E-13		6.39E-08		4E-15	1.78E-1	12 6.	00E-13	-8.09E-11
AP		Acidification potential of land			[kg S	[kg SO <sub>2</sub> -Eq.]		3.01E-02		03 2.	2.52E-05		5.48E-01		9E-06	1.09E-0	05 6.	08E-05	-8.09E-03
EP	EP E		and water  Eutrophication potential			[kg N-eq.]		2.81E-03		05 1.4	1.45E-06		2.69E-02		1E-07	4.64E-07		06E-06	-2.02E-04
Smo	Smog		Ground-level smog formation			[kg O <sub>3</sub> -eq.]		4.01E-01		02 5.8	5.88E-04		4.67E+00		5E-05	9.86E-05		52E-04	-8.35E-02
Resou	rces f	potential  Resources – fossil resources			; [	[MJ]		5.47E+00		01 3.0	3.00E-03		1.18E+02		1E-04	1.97E-0	03 8.	90E-03	-5.68E-01
RESU	JLTS	OF TH	IE LCA	A - RES	SOUR	CE US	E: On	e pie	ece o	f iCL	ASS	SE	R10 r	ead	er		<u> </u>		
Parar				Unit		A1 - A3		4	A5		В6		C2	C3		C4	D		
PE	RE	Renewable primary energy energy carrier				[MJ] 5.		24E+00 -			-		-		-	-		-	-
PEI	PМ	Rene	ergy	I M I	[MJ] 0.00		-00 -		_					<del>  </del>		_	_		
		resource Total us		mary				<b>-</b>			005.00					_	_		
PERT				- [IVIJ]		5.24E+00		:-02 2	2.38E-03 1.		1.96E+02		72E-04	7.93E-	03 6	.82E-03	-5.03E-01		
PENRE			ewable p energy		[MJ]		7.00E+01			-		-		-	-		-	-	
PENRM		Non rene	ewable p material ι		ergy as [MJ]		0.00E+00			-		-	-		-		-	-	
PENRT		Total use of non renewa				I IMJI		7.00E+01		E-01 3	3.00E-02 2.53		53E+03	E+03 6.91E-0		3 4.34E-02		.71E-02	-9.54E+00
SM		Use of secondary mate						2.58E-02		+00 0	).00E+	.00 0.0	00E+00	+00 0.00E+00		0.00E+00		.00E+00	0.00E+00
RS	RSF Use		f renewable secondary fuels		ndary	[MJ]	0.00	E+00	0.00E	÷00 0	0.00E+00		0.00E+00		00E+00	0.00E+	00 0	.00E+00	0.00E+00
NR	NRSF		Use of non renewable secon fuels			ondary [MJ]		E+00	0.00E	£+00 0	0.00E+00		0.00E+00		00E+00	0.00E+	00 0.	.00E+00	0.00E+00
F۱	Ν	Use of net fresh wate			er	[m³] 2.8		7E-02	E-02 1.14E-0		2.65E-04		8.91E-01		92E-07	1.96E-	05 4	.84E-04	-6.42E-03
RESU	JLTS	OF TH	IE LCA	4 – OU	TPUT	FLOW	/S AN	D W	ASTE	CAT	ΓEG	ORIE	S: Or	ne p	oiece	of iCL	ASS	SE R1	10
reade	er																		
Param	neter	Parameter					Unit	A1	1 - A3	A4		A5	Be	6	C2	С	3	C4	D
HW	/D	Hazardous waste disposed					[kg]	3.2	3E-03	1.22E-	06 2.0	)6E-06	3 1.97E	-03	1.57E-	08 6.021	E-06	7.61E-06	-1.88E-04
NHWD		Non hazardous waste disposed					[kg]	[kg] 1.04		4.09E-	E-05 2.29E-		-03 8.09E		8.69E-	07 1.40	E-05	2.87E-02	-3.27E-02
RWD		Radioactive waste disposed					[kg]							2.09E-01 9.05E-			1		
CRU		Components for re-use					[kg]					+		.00E+00 0.00E+					
MFR		Materials for recycling					[kg]							.00E+00 0.00E+					
MER		Materials for energy recove				у	[kg]	_			E+00 0.00E+00		_			_			-
EEE EET		Exported electrical energy  Exported thermal energy					[MJ]	In n	$0 = \pm 0.01$			IEE O		.00E+00 0.00E+				0.000.04	
	-						[MJ]	_					-			_			-



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