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-20150220-IBA1-EN

Issue date 17.08.2015

Access control systems – pivCLASS SE RP40-H 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-20150220-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))

Menmanes

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 Lenmanr (Managing Director IBU)

pivCLASS SE RP40-H

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 pivCLASS SE RP40-H, with pigtail, including all custom configurations.

Scope:

The Life Cycle Assessment is based on data collected by the contract manufacturer of the RP40-H at their production facility located in 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

internal

x externally



Dr. Wolfram Trinius (Independent verifier appointed by SVR)

2. Product

2.1 Product description

The pivCLASS SE RP40-H 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 or low 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:

- PKI-Based FIPS-201 including PIV, PIV-I, CIV, CAC, TWIC, and FRAC
- pivCLASS SE
- SE for DESFire EV1
- SE for MIFARE Classic
- HID Prox / AWID
- Indala Prox

Configurable functions:

- LED function
- · Audible signal (Beep)

- · Communication format
- Optical Tamper

2.2 Application

The pivCLASS SE RP40-H reader is suitable for indoor and outdoor use, where ID authentication is required. Common applications include: Government buildings and Military installations.

2.3 Technical Data

The table presents the technical properties of pivCLASS SE RP40-H reader:

Technical data

recimical data						
Name	Value	Unit				
Mounting	Wall Switch Size	-				
Power supply	5-16VDC	V				
Current Requirements	110mA	Α				
Operating Temperature	-35 to 65	°C				
Operating Humidity	5% to 95%	%				
Transmit Frequency	13.56MHz and 125kHz	kHz				
Power Input "Standby"	1.02	W				
Power Input "Operation"	1.32	W				



2.4 Placing on the market / Application rules

Compliance with US, Canada, and CB Scheme Safetv:

- 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: 3.3" x 4.8" x 1.0" (8.4cm x 12.2cm x 2.4cm).

2.6 Base materials / Ancillary materials

The average composition of pivCLASS SE RP40-H reader is as following:

Component	Percentage in mass (%)
Plastics	61.5
Stainless Steel	3.1
Glass	9.2
Electronics (signal-power)	24.0
Electronics (signal)	2.2
Total	100.0

2.7 Manufacture

The pivCLASS SE RP40-H 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 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

pivCLASS SE RP40-H readers 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	98.06
Plastics	1.94
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 pivCLASS SE RP40-H 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 RP40-H, 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 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 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 pivCLASS SE readers is available by:

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

Internet: www.hidglobal.com

Tel: 512-776-9000

3. LCA: Calculation rules

3.1 Declared Unit

The declaration refers to the functional unit of 1 piece of pivCLASS SE RP40-H 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 pivCLASS SE RP40- H
Mass (without packaging)	0.27	kg
Conversion factor to 1 kg	3.68	-

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 pivCLASS SE RP40-H 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)	0.0656	kg
Output substances following waste treatment on site (Plastic packaging)	0.0013	kg

Reference service life

Name	Value	Unit
Reference service life	30	а

Operational energy use (B6)

Operational energy use (Bb)							
Name	Value	Unit					
Electricity consumption	256.89	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	0.0123	kg
Collected as mixed construction waste construction waste for landfilling	0.2595	kg
Reuse plastic parts	0.0084	kg
Recycling stainless steel, electronics	0.0040	kg
Landfilling - Construction waste for landfill	0.2595	kg

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

Name	Value	Unit
Collected separately waste Card reader (including packaging)	0.3387	kg
Recycling stainless steel	0.13	%
Recycling electronics	1.05	%
Thermal treatment (plastics)	2.47	%
Loss Construction waste for landfilling (no recycling potential)	76.60	%
Reuse packaging (paper)	19.37	%
Reuse packaging (plastics)	0.38	%



5. LCA: Results

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

DESC	CRIP	TION O	F THE	THE SYSTEM BOUNDARY (X = INCLUDED IN LCA;						MND	= MOD	ULE N	OT DE	CL/	ARED)			
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A1	A2	A3	A4	A5	B1	B2	В3	В	34 B	5	В6	B7	C1	C2	С3	C4		D
Х	Х	Х	Х	Х	MND	MND	MND	M	ND MN	D	Х	MND	MN	D X	Х	Χ		Х
RESU	JLTS	OF TH	IE LCA	4 - EN\	/IRON	MENT	AL IN	1PA	CT: Or	ne pi	iece c	of piv	CLA	SS SE I	RP40-H	reade	er	
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ODF	Р	Depletion stratosph			[kg CFC		2.56E	-09	3.85E-1	3 4.2	25E-13	6.311	≣-08	3.86E-15	4.20E-12	2 1.32	E-12	-1.43E-10
AP	,	Acidificatio			[kg SC) ₂ -Eq.]	6.77E	-02	1.98E-0	3 2.	12E-05	6.16	E-01	3.69E-06	2.89E-05	5 1.18	E-04	-2.36E-02
EP	,		cation po	otential	[kg (PO) ³⁻ - Eq.]	5.47E	-03	2.21E-0	4 3.7	70E-06	3.29	E-02	8.43E-07	1.63E-06	3 1.05	E-05	-1.39E-03
POC	P	tropos	tion poten spheric oz emical ox	one	[kg Eth	en Eq.]	4.58E	-03	5.39E-0	5 1.	50E-06	3.771	≣-02	-1.19E-06	1.72E-06	6.03	E-06	-1.24E-03
ADP	E	Abiotic depletion potential for non fossil resources		[kg Sl	Eq.]	1.11E	-03	2.90E-0	9 1.6	68E-09	2.411	E-05	3.04E-11	8.49E-10	3.37	E-08	-1.57E-03	
ADP	F	Abiotic dep	letion po	tential for	[N	IJ]	1.38E	+02	1.24E+0	0 2.6	60E-02	2.10	+03	1.11E-02	6.97E-02	1.96	E-01	-2.40E+01
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Param PER PER PENF PENF PENF RSI NRS FW RESU	RE RM RT M F F G G G G G G G G G G G G G G G G G	Renew Rene resource Total us Non rene Non rene Use of re Use of ne Use OF TH	Parar rable prir energy wable pi es as ma se of ren energy re ewable p energy ewable p naterial u of non re energy re of secon enewable on renev fue e of net t	mary ene carrier rimary er example pesources rimary er carrier rimary er extensive example pesources dary mat execonda wable seeds fresh wat	rgy as lergy lization orimary hergy as hergy as e primary erial ary fuels condary ter	Un [M. [M. [M. [M. [M. [M. [M. [M	it A J] 1.C J] 0.C J] 1.E J] 1.E J] 0.C J] 1.E J] 0.C J] 1.E J] 0.C J] 6.A //S AN	01E+ 00E+ 00E+ 55E+ 00E+ 555E+ 00E+ 00E+ 1D V	3 A 01 - 00 - 01 2.11E 02 - 00 - 02 1.24E 02 0.00E 00 0.00E 00 1.84E VASTE	E-02 E+00 E+00 E+00 CA	2.43E- - - 3.05E- 0.00E+ 0.00E+ 2.70E-	03 2.0 03 2.0 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0	B6	C2	C3	01 2.19 00 0.00 00 0.00 00 0.00 05 1.11		- -1.11E+00 - -2.56E+01 0.00E+00 0.00E+00 0.00E+00 -1.60E-02
Param PER PER PENF PENF SM RSI NRS FW RESU H rea	RE RE RE RT M F F CONTROL OF THE RE RE RT M F F CONTROL OF THE RE	Renew Rene resource Total us Non rene Non rene Use of re Use of re Use of TH	Pararrate Parameter Parame	mary ene carrier imary en tetrial utile wable pesources rimary en carrier rimary en carrier rimary en carrier enewable esources dary mat e seconda wable seels fresh wat en could be co	rgy as lergy lization primary hergy as	Un [M. [M. [M. [M. [M. [M. [M. [M	it A J] 1.C J] 0.C J] 1.C J] 1.C J] 1.C J] 0.C J] 0.C J] 0.C J] 0.C J] 0.C A1 - A3	01-A1-A 00E+ 00E+ 01E+ 55E+ 00E+ 91E- 00E+ 48E- 1D V	3 A 01 - 00 - 01 2.11E 02 - 00 02 1.24E 02 0.00E 00 0.00E 00 0.00E VASTE	E+00 E+00 E+00 E+00 CA	2.43E 2.43E 3.05E- 0.00E+ 0.00E+ 2.70E- TEGO	003 2.00 002 2.66 000 0.00	B6	C2	C3 4 2.00E-0 2 1.09E-0 0 0.00E+ 0 0.00E+ 7 4.93E-0 c of piv(C3	02 1.53 01 2.19 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00 00 0.00		-1.11E+00 -1.11E+00 -1.2.56E+01 0.00E+00 0.00E+00 0.00E+00 -1.60E-02 RP40-
Param PER PER PENF PENF PENF RSI NRS FW RESU H rea Param	RE RE RT I I I I I I I I I I I I I I I I I I	Renew Rene resource Total us Non rene Non rene Use of Use of re Use of ne Use OF TH	Pararrate Parameter Parame	mary ene carrier imary ene terial utile ewable pasources rimary en carrier rimary en utilization enewable ascources dary mat e seconda wable seels fresh wat e e dispose	rgy as lergy lization orimary nergy as le primary erial ary fuels condary ter TPUT	Un [M. [M. [M. [M. [M. [M. [M. [M	it A J] 1.C J] 0.C J] 1.E J] 1.E J] 0.C J] 1.E J] 0.C J] 1.E J] 0.C J] 1.E J] 0.C J] 0.C	A1 - A O1E+ O0E+ O1E+ O0E+ O0E+ O0E+ O0E+ O0E+ O0E+ O0E O0E	3 A 01 - 00 - 01 2.11E 02 - 00 1.24E 02 0.00E 00 0.00E 00 0.00E 00 1.84E VASTE A4	E-02 E+00 E+00 E+00 CA CA 2.10	2.43E 3.05E- 0.00E+ 0.00E+ 2.70E- TEGO A5	02 2.6 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0 00 0.0	B6	C2	C3 4 2.00E-(2 1.09E-(0 0.00E+ 0 0.00E+ 7 4.93E-(C3 1.51E-05	01 2.19 00 0.00 00 0.00 00 0.00 00 1.11 CLASS	- BE-02 DE-01 DE+00 DE+00 DE+00 DE+00 DE+00	
Param PER PER PENF PENF SM RSI NRS FW RESU H rea Param	RE RM RT M F F Ger neter (D VVD	Renew Rene resource Total us Non rene Non rene Use of Use of re Use of ne Use OF TH	Paramer rable prir energy wable pi es as ma se of ren energy re energy	mary ene carrier rimary ene carrier resources rimary ene carrier rimary ene carrier rimary ene utilization enewable asources dary mate a secondary mate as carrier resh water enewable seeds fresh water enewable seeds resh	rgy as lergy lization primary nergy as le primary erial ary fuels condary ter TPUT U ed [I	Un [M. [M. [M. [M. [M. [M. [M. [M	it A J] 1.C J] 0.C J] 1.C J] 1.C J] 1.C J] 0.C J] 0.C J] 0.C J] 0.C J] 0.C Z J] 0.C Z Z Z Z Z Z Z Z Z Z Z Z Z	A1 - A O1E+ O0E+ O1E+ O0E+ O1E+ O0E+	3 A 01 - 00 - 01 2.11E 02 - 00 - 02 1.24E 02 0.00E 00 0.00E 00 0.00E VASTE A4 1.98E-06 6.60E-05	E+00 E+00 E+00 E-05 CA	2.43E 2.43E 3.05E- 0.00E+ 0.00E+ 2.70E- TEGO A5 0E-06 3E-03	02 2.6.000 0	B6	C2	C3 4 2.00E-0 2 1.09E-0 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ C3 1.51E-05 3.53E-05	02 1.53 01 2.19 00 0.00 00 0.00 00 0.00 05 1.11 01 1.718 06.208		-1.11E+00 -1.11E+00 -2.56E+01 0.00E+00 0.00E+00 -1.60E-02 RP40- D -4.14E-04 -2.25E-02
Param PER PENF PENF PENF SM RSI NRS FW RESU H rea Param HW NHW RW	RE RM RT 1 F F Ger V/D VVD V/D	Renew Rene resource Total us Non rene Non rene Use of Use of re Use of re Use of re Radioact	Pararrarararararararararararararararara	mary ene carrier rimary ene carrier resources rimary ene carrier rimary ene carrier rimary ene utilization enewable asources dary mate a secondary mate as carrier resh water enewable seeds fresh water enewable seeds resh	rgy as lergy lization orimary nergy as le primary e primary erial lary fuels condary ter TPUT U ed [i] led [i]	Un [M. [M. [M. [M. [M. [M. [M. [M	it A J] 1.0 J] 0.0 J] 1.6 J] 1.6 J] 0.0 J] 1.5 J] 0.0 J] 0.0	1 - A1 - A 100E+ 100E	3 A 01 - 00 - 01 2.11E 02 - 00 - 02 1.24E 02 0.00E 00 0.00E 00 1.84E VASTE A4 1.98E-06 6.60E-05 1.56E-06	E-02 E+00 E+00 E+00 CA 2.11 2.33	2.43E 3.05E- 0.00E+ 0.00E+ 2.70E- TEGO A5 0E-06 3E-03 8E-06	02 2.6 02 2.6 00 0.0 00 0.0 00 0.0 00 0.2 00	B6	C2	C3 4 2.00E-(2 1.09E-(00 0.00E+ 00 0.00E+ 7 4.93E-(c of piv(C3 1.51E-05 1.57E-05	01 2.19 00 0.00 00 0.00 00 0.00 00 1.11 CLASS CC 1.71 6.20 9.11		-1.11E+00 -1.11E+00 -2.56E+01 0.00E+00 0.00E+00 -1.60E-02 RP40- D -4.14E-04 -2.25E-02 -6.07E-04
Param PER PER PENF PENF SM RSI NRS FW RESU H rea Param	RE RE RT // LTS der r'D VVD // D U	Renew Rene resource Total use Non rene Non rene Use of re Use of n Hazardo Non r Radioact Comp	Pararrarararararararararararararararara	mary ene carrier rimary ene carrier rimary ene carrier resources rimary ene carrier rimary ene discources dary mat enewable enewable enewable enewable enewable enewable enewable enewable sources dary mat enewable seed enewable seed enewable seed enewable	rgy as lergy lization orimary nergy as lergy as	Un	it A J] 1.C J] 0.C J] 1.C J] 1.C J] 1.C J] 0.C J] 0.C J] 0.C J] 0.C J] 0.C Z J] 0.C Z Z Z Z Z Z Z Z Z Z Z Z Z	1 - A1 - A 1 - A1 - A1 - A 1 - A1 -	3 A 01 - 00 - 01 2.11E 02 - 00 - 02 1.24E 02 0.00E 00 0.00E 00 0.00E VASTE A4 1.98E-06 6.60E-05	E+00 E+00 E+00 E+00 E-05 CA ⁻ 2.11 2.33 1.76 0.00	2.43E 2.43E 3.05E- 0.00E+ 0.00E+ 2.70E- TEGO A5 0E-06 3E-03	02 2.6.000 0	B6	C2	C3 4 2.00E-0 2 1.09E-0 0 0.00E+ 0 0.00E+ 0 0.00E+ 0 0.00E+ C3 1.51E-05 3.53E-05	01 2.19 00 0.00 00 0.00 00 0.00 00 1.71 6.20 9.11 0 0.00 0		-1.11E+00 -1.11E+00 -2.56E+01 0.00E+00 0.00E+00 -1.60E-02 RP40- D -4.14E-04 -2.25E-02
Param PER PER PENF PENF PENF RSI NRS FW RESU H rea Param HW NHW RW	RE RM RT M F COLOR OF	Renew Rene resource Total use Non rene Non rene Use of re Use of n Hazardo Non r Radioact Comp	Pararre rable prir energy re es as ma se of ren energy re energy re energy re energy re energy re of secon enewable p energy re of secon enewable e of net to Parame ous wast nazardou dispose tive wast onents for rials for r	mary ene carrier rimary er example persources rimary er carrier rimary er carrier rimary er carrier rimary er extilization enewable pesources dary mat example secondary exa	rgy as lergy lization primary hergy as lergy as	Un	it A J] 1.C J] 0.C J] 1.E J] 1.E J] 0.C J] 1.E J] 0.C J] 1.E J] 0.C J] 0.C	1 - A1 - A 1 - A1 - A1 - A 1 - A1 -	3 A 01 - 00 - 01 2.11E 02 - 00 1.24E 02 0.00E 00 0.00E 00 1.84E 1.98E-06 6.60E-05 1.56E-06	E-02 E-02 E-02 E-00 E-00 E-00 E-00 E-00	2.43E 3.05E- 0.00E+ 0.00E+ 2.70E- TEGO A5 0E-06 3E-03 8E-06 0E+00	02 2.6 00 0.0 00 0.0	B6	C2 2 4.38E-0 - 3 1.12E-0 0 0.00E+0 0 0.00E+0 3.09E-0 C2 2.54E-08 1.40E-06 1.46E-08 0.00E+00	C3 4 2.00E-(2 1.09E-(0 0.00E+ 0 0.00E+ 7 4.93E-(1.51E-05 3.53E-05 1.57E-05 0.00E+0(3.41E-02	01 2.19 00 0.00 00 0.00 00 0.00 00 1.11 0 1.71E 0 6.20E 0 0.00E		-1.11E+00 -1.11E+00 -2.56E+01 0.00E+00 0.00E+00 -1.60E-02 RP40- D -4.14E-04 -2.25E-02 -6.07E-04 0.00E+00
Param PER PER PENF PENF PENF SM RSI NRS FW RESU H rea Param HW NHW RW CR	RE RM RT M F F CONTROL OF THE PROPERTY OF THE	Renew Rene resource Total use Non rene Non rene Use of re Use of ne Use of ne Compe Materials	Pararray rable prirenergy rewable penergy rewable penergy rewable poneterial under a control of the control of	mary ene carrier rimary er example persources rimary er carrier rimary er carrier rimary er carrier rimary er extilization enewable pesources dary mat example secondary exa	rgy as lergy lization primary hergy as le primary erial ary fuels condary ler TPUT Led [I] ed [I] ery [I]	Un	it A J] 1.C J] 0.C J] 1.C J] 1.C J] 1.E J] 0.C J] 0.C J] 0.C J] 0.C A1 - A3 7.32E-C 2.27E-C 6.86E-C 0.00E+C	1 - A1 - A 1 - A1 - A1 - A 1 - A1 -	3 A 01 - 00 - 01 2.11E 02 - 00 - 02 1.24E 02 0.00E 00 0.00E 00 0.00E 00 1.84E VASTE A4 1.98E-06 6.60E-05 1.56E-06 0.00E+00	E-02 E+00 E+00 E+00 E-05 CA 2.10 2.33 1.77 0.00 6.56 0.00	2.43E 2.43E 3.05E- 0.00E+ 0.00E+ 2.70E- TEGO A5 0E-06 3E-03 8E-06 0E+00 0E-02	002 2.6.00 0.00 0.00 0.00 0.00 0.00 0.00	B6	C2	C3 4 2.00E-0 1.09E-0 0.00E+0 0.00E+7 4.93E-0 3.53E-0 1.57E-0 0.00E+0 0.00E+0 0.00E+0	02 1.53 01 2.19 00 0.00 00 0.00 00 0.00 00 1.11 0.00 0 1.71 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00 0 0.00		-1.11E+00 -1.11E+00 -2.56E+01 0.00E+00 0.00E+00 -1.60E-02 RP40- D -4.14E-04 -2.25E-02 -6.07E-04 0.00E+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 4% and 14% 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. 98% - this impact category describes the reduction of the global amount of non-renewable 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 accounts with about 61% 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 85% and 93%, with the exception of ADPE (2%). 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. 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.gabi-software.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: EN50581:2012 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

EN 50130

EN 50130-4:2011: 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.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LC)	A: MND = MODULE NOT DECLARED)
	BENEFITS AND
PRODUCT STAGE CONSTRUCTI ON PROCESS STAGE USE STAGE	END OF LIFE STAGE END OF LIFE STAGE BEYOND THE SYSTEM BOUNDARYS
Raw material supply Transport Manufacturing Transport from the gate to the site Assembly Use Maintenance Repair Replacement ¹⁾ Replacement ¹⁾ Returbishment ¹⁾ Operational energy use	Use De-construction demolition Transport Waste processing Disposal Reuse- Recovery- Recycling- potential
A1 A2 A3 A4 A5 B1 B2 B3 B4 B5 B6 B	37 C1 C2 C3 C4 D
X X X X X MND MND MND MND MND X MN	ND MND X X X X
RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: One piece of p	pivCLASS SE RP40-H reader
Parameter Unit A1 - A3 A4 A5	B6 C2 C3 C4 D
GWP Global warming potential [kg CO ₂ -Eq.] 1.08E+01 9.63E-02 9.29E-02 1	.82E+02 8.06E-04 6.14E-03 4.39E-01 -2.23E+00
ODP Depletion potential of the stratospheric ozone layer [kg CFC11-Eq.] 2.75E-09 4.10E-13 4.52E-13 6	6.71E-08 4.10E-15 4.47E-12 1.40E-12 -2.04E-10
AP Acidification potential of land and water [kg SO ₂ -Eq.] 6.79E-02 2.13E-03 2.57E-05 5	5.75E-01 4.82E-06 2.74E-05 1.39E-04 -2.27E-02
	2.83E-02 3.41E-07 1.17E-06 4.93E-06 -5.99E-04
Smog Ground-level smog formation potential [kg O ₃ -eq.] 8.92E-01 3.95E-02 5.99E-04 4	1.90E+00 9.92E-05 2.48E-04 1.39E-03 -2.57E-01
	.24E+02 1.60E-03 4.96E-03 2.02E-02 -1.24E+00
RESULTS OF THE LCA - RESOURCE USE: One piece of pivCLASS	SE RP40-H reader
Parameter Unit A1 - A3 A4 A5	B6 C2 C3 C4 D
PERE Renewable primary energy as energy carrier [MJ] 1.01E+01	
PERM Renewable primary energy resources as material utilization [MJ] 0.00E+00	
PERT Total use of renewable primary energy resources [MJ] 1.01E+01 2.11E-02 2.43E-03 2	2.06E+02 4.38E-04 2.00E-02 1.53E-02 -1.11E+00
PENRE Non renewable primary energy as energy carrier [MJ] 1.55E+02	
PENRM Non renewable primary energy as material utilization [MJ] 0.00E+00	
PENRT Total use of non renewable primary energy resources [MJ] 1.55E+02 1.24E+00 3.05E-02 2	2.66E+03 1.12E-02 1.09E-01 2.19E-01 -2.56E+01
SM Use of secondary material [kg] 2.91E-02 0.00E+00 0.00E+00	0.00E+00
fuels	0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
NRSF Use of non renewable secondary fuels [MJ] 0.00E+00 0.00E+00 0.00E+00	0.00E+00 0.00E+00 0.00E+00 0.00E+00 0.00E+00
FW Use of net fresh water [m³] 6.48E-02 1.84E-05 2.70E-04	9.36E-01 3.09E-07 4.93E-05 1.11E-03 -1.60E-02
RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORI H reader	IES: One piece of pivCLASS SE RP40-
Parameter Parameter Unit A1 - A3 A4 A5	B6 C2 C3 C4 D
	-06 2.07E-03 2.54E-08 1.51E-05 1.71E-05 4.14E-04
HWD Hazardous waste disposed [kg] 7.32E-03 1.98E-06 2.10E-	
	-03 8.49E-01 1.40E-06 3.53E-05 6.20E-02 -2.25E-02
NHWD Non hazardous waste disposed [kg] 2.27E-01 6.60E-05 2.33E-	-03 8.49E-01 1.40E-06 3.53E-05 6.20E-02 -2.25E-02 -06 2.19E-01 1.46E-08 1.57E-05 9.11E-06 6.07E-04
NHWD Non hazardous waste disposed [kg] 2.27E-01 6.60E-05 2.33E- RWD Radioactive waste disposed [kg] 6.86E-03 1.56E-06 1.78E-	
NHWD Non hazardous waste disposed [kg] 2.27E-01 6.60E-05 2.33E- RWD Radioactive waste disposed [kg] 6.86E-03 1.56E-06 1.78E- CRU Components for re-use [kg] 0.00E+00 0.00E+00 0.00E+	-06 2.19E-01 1.46E-08 1.57E-05 9.11E-06 -6.07E-04
NHWD Non hazardous waste disposed [kg] 2.27E-01 6.60E-05 2.33E- RWD Radioactive waste disposed [kg] 6.86E-03 1.56E-06 1.78E- CRU Components for re-use [kg] 0.00E+00 0.00E+00 0.00E+ MFR Materials for recycling [kg] 0.00E+00 0.00E+00 6.50E-	-06 2.19E-01 1.46E-08 1.57E-05 9.11E-06 -6.07E-04 +00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 -
NHWD Non hazardous waste disposed [kg] 2.27E-01 6.60E-05 2.33E- RWD Radioactive waste disposed [kg] 6.86E-03 1.56E-06 1.78E- CRU Components for re-use [kg] 0.00E+00 0.00E+00 0.00E+ MFR Materials for recycling [kg] 0.00E+00 0.00E+00 6.50E- MER Materials for energy recovery [kg] 0.00E+00 0.00E+00 0.00E+	-06 2.19E-01 1.46E-08 1.57E-05 9.11E-06 -6.07E-04 +00 0.00E+00 0.00E+00 0.00E+00 0.00E+00 - -02 0.00E+00 0.00E+00 3.41E-02 0.00E+00 -





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