REPORT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

No. 2500906STO-102

EQUIPMENT

Equipment:	Apeiro HUB
Type/Model:	AH20, AH30, AH40
Manufacturer:	ASSA ABLOY AB
Tested by request of:	ASSA ABLOY AB

SUMMARY

Based on the assessment in this statement, the equipment is determined to comply with the following requirements without testing:

CFR 47 §1.1307, §1.1310
RSS-102 Issue 6

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Signed at:2025-02-28 08:54:22 +01:00
Reason:I approve this document

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Revision History

Test report number	Date	Description	Changes
2407959STO-103	December 12, 2024	First release	
2500906STO-102	See page 1	Second release	Added HVIN number.

CONTENTS

1 CLIENT INFORMATION

This assessment has been done by request of:

Company	ASSA ABLOY AB Förmansvägen 11 117 43 Stockholm Sweden
Name of contact	Magnus Axelsson

2 EQUIPMENT

2.1 Identification of the equipment

Equipment:	Aperio HUB
Type/Model:	AH20, AH30, AH40
Brand name:	ASSA ABLOY
Manufacturer:	ASSA ABLOY AB
HVIN number:	P001082870E (AH20 & AH30) P001081348F (AH40)
Radio Technologies	BLE
Transmitter frequency range:	2402 – 2480 MHz
Measured output power*:	+6.3 dBm (conducted)
Antenna gain:	3.6 dBi (internal antenna) 2.3 dBi (external antenna)
User separation distance:	≥ 20 cm
Exposure conditions:	☐ Controlled environment (occupational) ☒ Uncontrolled environment (general population)

* Reference for measurement: Test report 2500906STO-101

2.2 Opinions and interpretations

The following type are also included as additional type in this test report:
AH30

The difference as compared to the tested type is according to the manufacturer:

Both AH20 and AH30 can only be supplied with external power supply. AH40 is the only module supported with PoE but can also be supplied with external power supply.
The models AH20, AH30, and AH40 have an identical radio design and schematic. The AH20 and AH30 are built on one PCB, while the AH40 uses a different PCB layout.
The primary distinction between the AH20 and AH30 is that the AH20 features a Wiegand interface, while the AH30 has an RS485 interface.

All three models are compatible with both external and internal antennas. Additionally, they support multiple bandwidth modulation options, including 1 MHz and 2 MHz bandwidths.

3 TEST SPECIFICATIONS

3.1 Standards

CFR 47: Code of Federal Regulations Title 47: Telecommunications §1.1307, §1.1310
KDB447498 D01 v06

RSS-102 Issue 6: Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

3.2 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standards.

3.3 Decision rule

The statements of conformity are reported as:
Passed – When the measured values are within the specified limits.
Failed – When one or more measures values are outside the specified limits.

4 SUMMARY

The evaluation has been carried out at the Intertek Semko AB premises in Kista, Sweden.
The results in this report apply only to sample tested:

Test	Result
RF Exposure, single transmitter	PASS
RF Exposure, multiple simultaneous transmitters	NA[1]

[1]EUT only has a single transmitter or transmitters cannot operate simultaneously

5 RF EXPOSURE, SINGLE TRANSMITTER

Result:	PASS

5.1 Limits

Reference: CFR 47 §1.1310 TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

Reference: RSS-102 – Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) Issue 6

Section 6.6

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operatesas follows:

• below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

• at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 48 MHz and below 300 MHz and the source-based, time-averagedmaximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);

• at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$W (adjusted for tune-up tolerance), where f is in MHz;

• at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

5.2 Calculations

EIRP: $Power\ to\ antenna\ (dBm) + Antenna\ gain\ (dBi) = EIRP\ dBm$
Measured EIRP = 9.9 dBm

Conversion dBm to W:

EIRP: $1\ mW * 10^{\left(EIRP\frac{dBm}{10}\right)} = 9.77\ mW$

Time averaged maximum power:

EIRP: $EIRP\ mW * Duty\ cycle = EIRP\ mW$

MPE calculation

A worst-case calculation for power density:

$$S = \frac{dc \times EIRP}{4 \times \pi \times r^2}$$

dc = 1
S = mW / cm^2
r = 20 cm

S = (1*9.77mW / 4*π*r^2) = 0.00194 mW/cm^2

5.3 Results

Standard	Reference for limit	Value	Unit	Limit	Result
§1.1310	§1.1310	0.00194	mW /cm^2	1	PASS
RSS-102	RSS-102	0.00977	W	2.676	PASS