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**FESTO**

Date:  
8<sup>th</sup> January, 2018

**RF Exposure Analysis for the Festo Didactic SE CPS GATE**  
**FCC ID: 2AMRG-CPSGATE**

Unser Zeichen  
DC-ERDD/ANAH

The product (FCC ID: 2AMRG-CPSGATE) is a multifunctional controller with PLC functionality which incorporates 13.56 MHz RFID.

Rechtsform:  
Europäische Aktiengesellschaft (SE)  
Sitz: Esslingen a. N.  
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HRB 748211  
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Analysis for FCC mobile use of 13.56 MHz RFID

The FCC requires that the calculated MPE be equal to or less than a given limit dependent on frequency at a distance of 20 cm from a device to the body of a user.

The following equation applies:

$$S = \text{EIRP} / 4 \pi R^2$$

Where:

- S = Power density
- EIRP = Effective Isotropic Radiated Power (EIRP = P x G)
- P = Conducted Transmitter Power
- G = Antenna Gain (relative to an isotropic radiator)
- R = distance to the centre of radiation of the antenna (safe operating distance)

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## Power Density Requirement

From FCC Rule Part 1.1310 Table 1 - Limits for General Population/ Uncontrolled Exposure,  $S=0.98 \text{ mW/cm}^2$  at 13.56 MHz

$$S = 180 / f^2 \text{ (f is frequency in MHz)}$$

$$\text{At 13.56 MHz, } S = 180 / (13.56)^2$$

$$\mathbf{S = 0.98 \text{ mW/cm}^2}$$

EIRP = -43.4 dBm (including tune up tolerance) which equates to 46 nW or 0.000046 mW

## Calculation:

$$S = \text{EIRP} / 4 \pi R^2$$

$$S = 0.000046 / (12.56 \times 20^2)$$

$$S = 0.000046 / (5024)$$

$$\mathbf{S = 9.2 \times 10^{-9} \text{ mW/cm}^2}$$

## **Conclusion**

This demonstrates the CPS GATE meets the requirement of  $S = 0.98 \text{ mW/cm}^2$  for >20cm module usage, and equates to a safe operating distance of **0.002 cm**.

Signature:



Date: 08<sup>th</sup> January, 2018

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