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10/08/2018

**MEASUREMENT TECHNICAL REPORT**  
*Measurement technical report*

**Customer Name and Address :** ELEKTRAL ELEKTROMEKANİK SAN.TİC.ŞTİ.

*Customer name and Address :* İAOSB M. KEMAL ATATÜRK BLV. No:23-25 ELEKTRAL A.Ş. ÇIĞLI / İZMİR

**Order No** : 2018-03

**Name and identity of test item:** : ThruScan sX-i Walk Through Metal Detector

**Remark and Standards** : IEEE Std C95.6™-2002  
**IEEE Standard for Safety Levels for Human Exposure to Electromagnetic Fields (0-3 kHz)**  
*IEEE Standard for Safety Levels for Human Exposure to Electromagnetic Fields (0-3 kHz)*

**Date of test** : 09.08.2018

**Number of pages** : 10

Measurement results, uncertainties with confidence probability, and test methods are given on following pages which should be regarded as complementary of this report.

**Seal**  
*Seal*



**Date**  
*Date*

10.08.2018

**Measurement by**  
*Measurement by*

Abdullah  
DEMİR

**Firm Director**

Mustafa AVCI

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## Data of measurement device

<b>Device usage</b>	Multizone Walk Through Metal Detector
<b>Device physical dimensions</b>	72 x 68 x 200cm internal 83 x 68 x 220cm external
<b>Device weight</b>	79 kg
<b>Device operating voltage</b>	70VAC-270VAC 50/60 Hz
<b>Device power consumption</b>	On-hold 10w - Alarm 20w
<b>Device connection interfaces</b>	
<b>Measurement conditions</b>	Ethernet - USB - RS422 - RS485 - Wi-fi
<b>Measurement location</b>	İzmir/Çiğli Elektral A.Ş. Factory R&D department
<b>Measurement temperature (°C )</b>	28 ±
<b>Relative humidity ( % )</b>	45



## Devices Used in Measurement

Device Brand	Device Model	Device Serial No	Measurement Frequency Range
<b>Narda</b>	EMR- 300 Electromagnetic Radiation Meter	AX-0085	3kHz-60 GHz
<b>Narda</b>	NBM-550 Broadband Field Meter	B-0816	100kHz - 60 GHz
<b>Wandel &amp; Goltermann</b>	EMR- 300 Electromagnetic Radiation Meter	AA-0028	3kHz-60 GHz
<b>Aaronia</b>	RF Spectrum Analyzer HF-6085-V4	44813-	1Hz - 60 GHz
<b>Narda</b>	<i>Electric and Magnetic Field Analyzer EHP-50C</i>	352WN90614	5 Hz -100 KHz
<b>Narda</b>	<i>Isotropic H-Field Probe Type 13.0</i>	M-0005	3 Khz-3 MHz
<b>Narda</b>	<i>Isotropic H-Field Probe Type 10.2</i>	Y-0027	27 MHz -1 GHz
<b>Narda</b>	<i>Isotropic Field Probe Type 8.3</i>	AY-0091	50 Khz-3 GHz
<b>Narda</b>	<i>Isotropic E-Field Probe Type EF0391</i>	A-0898	100 kHz-3 GHz
<b>Narda</b>	<i>Isotropic E-Field Probe Type 11.3</i>	K-0032	27 MHz - 60 GHz
<b>Aaronia</b>	<i>Bicolog 5070 Biconical EMC broadband antennas</i>	78468	50 MHz-700 MHz

### Measurement Devices Used in Test

Measurement devices and probs that are periodically calibrated according to related standards used.

### Measurement Personnel

Personnel that has adequate technical training and has certificate from information technologies and communication course and examination

Authorised Measurement Personnel



## Measurement details

<b>Device usage</b>	This device detects metal objects on people with electromagnetic waves.
<b>Measurement Purpose</b>	Analysing effects of the detector on human health, and magnetic and electric field effects.
<b>Measurement Reason 1</b>	IEEE Std C95.6™-2002 standards due to frequency of Walk Through Detector Safety Levels for Humans for Electromagnetic Field Exposure

**Measurement Reason 2** : 27912 BTK regulations due to Wi-Fi communication

“Limit Value Identification, Control, and Auditing Regulation for Exposure to Electromagnetic Field Intensity due to Electronic Communication Devices for International Standards” published on 21 April 2011 in Journal No.27912 at “International Commission of Non-Ionizer Radiation Protection (ICNIRP)”

**Device power status during measurement.** Measurement was conducted at maximum operation level and alarm state. The system was communicated via Wi-Fi to achieve **maximum operation level** and measurements were made.

**Device status** : Device is ready for end-user.

**Device connection status** Measurement was made when there was no connection other than power line and Wi-Fi connections.

**Measurement Method** Measurement was made by positioning door director vertically to the ground about 30cm- 110cm and 180 cm higher than ground, and device steady-state was waited to make measurement.

Magnetic field and electric field measurements were completed with 3 different devices and 4 different probes.



## Measurement details

### Measurement details and explanations

Devices used in measurement measure environment all devices operating between 50 KHz-60 GHz. Additionally, antenna of this device is isotropic and measures signals from every axial positions (X, Y, Z).

Magnetic Field and Electric field measurements were made separately with devices used in measurement.

IEEE Std C95.6™-2002

IEEE Standard for Safety Levels for Human Exposure to Electromagnetic Fields (0-3 kHz) is given below.

**Table 1—Basic restrictions applying to various regions of the body\* - b**

Exposed tissue	f (Hz)	General public	Controlled environment
		E <sub>0</sub> - rms (V/m)	E <sub>0</sub> - rms (V/m)
Brain	20	5.899 x 10 <sup>3</sup>	1.77 x 10 <sup>-2</sup>
Heart	167	0.943	0.943
Hands, wrists, feet, and ankles	3350	2.10	2.10
Other tissue	3350	0.701	2.10

Limited values for related frequency range determined by “Limit Value Identification, Control, and Auditing Regulation for Exposure to Electromagnetic Field Intensity due to Electronic Communication Devices for International Standards” published on 21 April 2011 in Journal No.27912 are given below.

Determined limit values for environment and single device

**f= frequency (mhz)**

Frequency Range (MHz)	E-field intensity (V/m)		H-field intensity (A/m)	
	Limit value for single	Limit value for	Single device limit value	Total limit of environment
0.010-0.15	19.3	65.25	1.1	3.75
0.15-1	19.3	65.25	0,16/f	0,54/f
1-10	19,3/f	65,25/ f	0,16/f	0,54/f
10-400	6.2	21	0.016	0.054
400-2 000	0,305f <sup>½</sup>	1,03 f <sup>½</sup>	0,00082 f <sup>½</sup>	0,0027 f <sup>½</sup>
2 000-60	13.5	45.75	0.035	0.12

## Technical data, information

Electromagnetic (EM) fields emitted by electromagnetic tools are radiations without ionisation. This means such radiations do not alter cell structure.

However, thermal and non-thermal effects can be observed on living beings whom subjected to non-ioniser EM waves. Thermal effects are defined as conversion of EM energy absorbed by the body to heat and thus increased body temperature. This temperature rise can be balanced by discarding with blood circulation or other body functions. Non-thermal effects are defined as chemical, genetic, and psychologic.

Main authorised bodies regarding safe and secure limit values for individuals under EM field effect are International Commission of Non-Ionizer Radiation Protection (**ICNIRP**) and Institute of Electrical and Electronic Engineers (**IEEE**) for Europe and many other countries.

(Source: <http://www.who.int/peh-emf/research/en/>).

## RESULTS

It was determined that electromagnetic field and electric field measurements for ThruScan sX-i Door Type Metal Detector was significantly below limit values determined by Institute of Electric and Electronic Engineers (IEEE), International Commission of Non-Ionizer Radiation Protection (ICNIRP), and Information Technologies and Communication Authority, Turkey (BTK). It was concluded that these limit values were below negative effects to human health.

### Appendixes:

**Appendix A** : Test Observations and Photos ( 4 pages )

**Appendix B** : Measurement Authority Authorisation (2 pages)

**Appendix C** : Personnel Authorisation Document

**TEST OBSERVATION (Magnetic field measurement)**

	Distance (cm.)	Measured Magnetic Field Intensity (A/m)	Environment Total (v/m)	Measured Power Intensity (W/m <sup>2</sup> )
<b>1.Measurement</b>	30	0.0029	1.14	0.0032
<b>2. Measurement</b>	110	0.0033	1.32	0.0044
<b>3. Measurement</b>	180	0.0036	1.44	0.0052

**Measurement**

**Tool:**

Brand Narda : 11  
Model EMR- 300 Electro Magnetic Radiation Meter  
Serial No Z-0017

**Measurement**

**Antenna:**

Type Isotropic H-Field Probe Type 13.0  
Serial No M-0005  
Frequency Range 3 Khz-3 MHz  
Antenna Gain (dBi) 0



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**TEST OBSERVATION (Magnetic field measurement)**

	Distance (cm.)	Measured Magnetic Field Intensity (A/m)	Environment Total (v/m)	Measured Power Intensity (W/m <sup>2</sup> )
1. Measurement	30	0.0018	0.73	0.0013
2. Measurement	110	0.0017	0.68	0.0012
3. Measurement	180	0.0014	0.55	0.0008

Measurement

Device:

Brand : Narda :11

Model : EMR- 300 Electro Magnetic Radiation Meter

Serial No I AA-0028

Measurement Antenna:

Type Isotropic H-Field Probe Type 10.2

Serial No Y-0027

Frequency Range 27 MHz -1 GHz

Antenna Gain (dBi) 0



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**TEST OBSERVATION (Electric field measurement)**

	Distance (cm.)	Measured Magnetic Field Intensity (A/m)	Environment Total (v/m)	Measured Power Intensity (W/m <sup>2</sup> )
<b>1. Measurement</b>	<b>30</b>	<b>0.0007</b>	<b>0.28</b>	<b>0.0002</b>
<b>2. Measurement</b>	<b>110</b>	<b>0.0008</b>	<b>0.32</b>	<b>0.0003</b>
<b>3. Measurement</b>	<b>180</b>	<b>0.0017</b>	<b>0.69</b>	<b>0.0012</b>

Measurement Device:

Brand : Narda : 11  
Model : NBM-550 Broadband Field Meter  
Serial No : B-0816

Measurement Antenna:

Type Isotropic E-Field Probe Ty: EF0391  
Serial No A-0898  
Frequency Range 100 kHz -3 GHz  
Antenna Gain (dBi) 0



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**TEST OBSERVATION (Electric field measurement)**

	Distance (cm.)	Measured Magnetic Field Intensity (A/m)	Environment Total (v/m)	Measured Power Intensity (W/m <sup>2</sup> )
1.Measurement	30	0.0008	0.30	0.0002
2.Measurement	110	0.0010	0.39	0.0004
3.Measurement	180	0.0011	0.42	0.0004

**Measurement**

**Device:**

Brand : Wandel & Golte: 11

Model : EMR- 300 Electro Magnetic Radiation Meter

Serial No : AA-0028

**Measurement**

**Antenna:**

Type : Isotropic E-Field Probe Type

Serial No : 11.3 K-0032

Frequency Range : 27 MHz-60 GHz

Antenna Gain (dBi) : 0



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Certificate No:

## **ELECTROMAGNETIC FIELD MEASUREMENT CERTIFICATE**

Abdullah Demir with National Identity Number of 20735790250  
is entitled with this certificate due to successful results in “Electromagnetic Field  
Measurement Certificate Course Program” organised between 2-5 July 2012.

A handwritten signature in blue ink, appearing to read 'T. Acarer', is written over a light blue horizontal line.

**Dr. Tayfun ACARER**  
**Chairperson**

**REPUBLIC OF TURKEY  
INFORMATION TECHNOLOGIES AND  
COMMUNICATION INSTITUTE**

ELECTROMAGNETIC FIELD INTENSITY MEASUREMENT AUTHORISATION DOCUMENT FOR  
STATIONARY ELECTRONIC COMMUNICATION DEVICES WORKING BETWEEN 50 MHz - 3 GHz  
FREQUENCY BAND

**MEASUREMENT AUTHORITY  
AUTHORISATION**

**Document No** BTK.OZL35002-004

**User Code** OZL35002 Region Code : 2

**Tax Register No** 147349

**Title** DAMA ENERJİ TELEKOMÜNİKASYON  
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**Phone** 232 461-3262

**Certificate Validity Duration** 28/12/2016-28/12/2018



28/12/2016



REPUBLIC OF TURKEY  
INFORMATION TECHNOLOGIES AND  
COMMUNICATION INSTITUTE  
Spectrum Monitoring Department



09/01/2017

Issue: 62323540-307.01-E.621

Subject: Renewal Process of ÖYB

DAMA ENERJİ DAMA ENERJİ TELEKOMÜNİKASYON İKLİMLENDİRME İNŞ.ELEKT.  
BİLG. TUR. SAN. TİC. LTD. ŞTİ

Mansuroğlu Mah. 263 Sok. NO: 10 D:4 Özyeğin Apt. Bayraklı / İZMİR

Relation: a)

“Limit Value Identification, Control, and Auditing Regulation for Exposure to Electromagnetic Field Intensity due to Electronic Communication Devices for International Standards” published on 21 April 2011 in Gazette No.27912

- b) 05/10/2016 and No.2 document of Dama Enerji Telekomünikasyon İklimlendirme İnş.Elekt. Bilg. Tur. San. ve Tic. Ltd.
- c) 05/10/2016 document of Dama Enerji Telekomünikasyon İklimlendirme İnş.Elekt. Bilg. Tur. San. ve Tic. Ltd.
- ç) 25/11/2016 and No.62323540-307.03E.67107 document of BTK Directorate (Spectrum Monitoring Department).
- d) 07/12/2016 document of Dama Enerji Telekomünikasyon İklimlendirme İnş.Elekt. Bilg. Tur. San. ve Tic. Ltd.
- e) 08/12/2016 and No.7 document of Dama Enerji Telekomünikasyon İklimlendirme İnş.Elekt. Bilg. Tur. San. ve Tic. Ltd.
- f) 27/12/2016 document of Dama Enerji Telekomünikasyon İklimlendirme İnş.Elekt. Bilg. Tur. San. ve Tic. Ltd.

As your application under (b), (c), (d), (e), and (f) is evaluated under our (ç); (a) it was seen that all matters stated in the regulation have been completed and 50 MHz - 3 GHz frequency range Measurement Authorisation Document valid between 28.12.2016-28.12.2018 is send at the Attachment.

On the other hand, if declared documents are missing, there are insufficient number of measurement equipment or there are any conditions against the regulation during the audits your company at different times, necessary action will be taken under (a) Regulation articles.

I kindly request you to take necessary action

**Note: This document has been signed electronically under 5070 Electronic Signature Law.**

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e-signature

Dr. Ömer Fatih SAYAN  
Chairperson

For information  
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Technical Expert