Annex no. 12

Antenna Description

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Datasheet and Short-Specification

SAT-A25/30-MR-P-13MHz / Midrange Antenna

scemtec
Transponder Technology GmbH

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1 CONTENTS

2 GENERAL

As this technology is based on radio frequency, one must exercise the following operational and mounting instructions to achieve best operation:

Metal affects radio signals. Normally the antenna has to be as far away as possible from any metal object and it's damping influence on the magnetic field. Only this leads to the best distribution of the magnetic field in the reading range. Very important as well is not to have "short circuits", in the vicinity of the antenna, damping the magnetic field. A "short circuit" is any metal close to the antenna, building a "metallic ring", so that currents introduced by the RF-field can flow, destroying the energy needed for the tag to operate.

Care must be exercised to reduce or eliminate unwanted signals (so called interference or noise) from external sources. The reading range may be reduced by following noise sources:

- portable two way radio
- cellular phones
- switching power supplies
- computer monitors
- frequency converters (e.g. motor control systems)

The reading range is depending upon

- performance of the reader
- size of the antenna
- size of the tag (the bigger the better)
- orientation of the tag antenna plane to the reader antenna plane
- quality of the tag
- matching of reader antenna size and tag (-antenna) size (see table with scemtec antennas)
- environmental, electrical noise

If influence of metal can not be fully avoided a tuning of the antenna is required and will improve reading range.

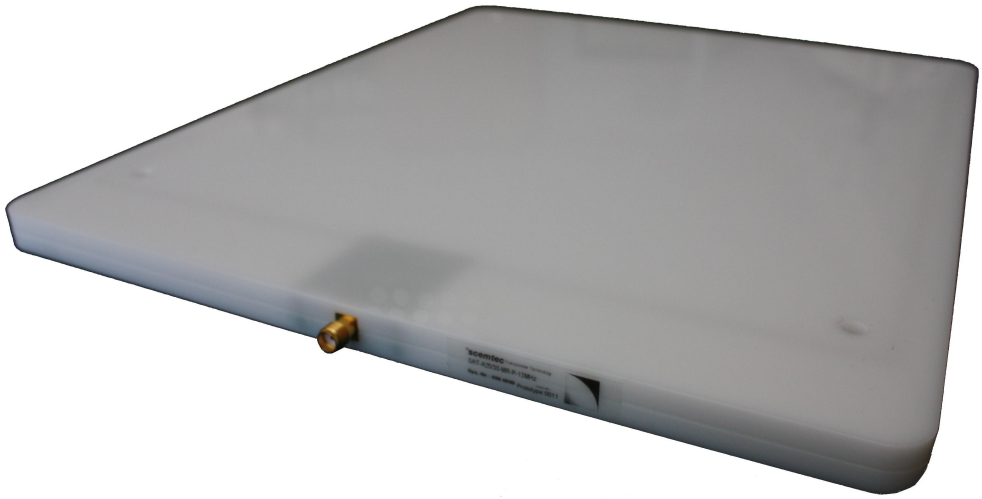
Important notice:

Scemtec reserves the right to make changes to the product described in this specification without notice.

This product is not developed to be used in safety-critical applications and therefore must not be used in such applications.

3 ANTENNA DESCRIPTION

This following short-specification describes the general functionality, typical values regarding detection-performance, electrical HF-behaviours (relvant conformity) and dimensions of the midrange antenna **SAT-A25/30-MR-P-13MHz** especially designed and optimised for best performance regarding in the combination with ***scemtec´s*** **reader-systems SIR-2720** with 1,5W HF-power @ 13,56 MHz and **SIR-2010** with 500mW HF-power @ 13,56 MHz .



4 TYPICAL DETECTION-PERFORMANCE

The following table describes the detection-performance regarding the unique TAG-ID of two typical transponder TAG-types by using the SIR-2720 (with 1,5W HF-power) and SIR-2010 (with 0,5 W HF-power) midrange reader-systems in combination with this midrange antenna **SAT-A25/30-MR-P-13MHz** .

Transponder TAG-Type (chip-type/asic)	dimension	Detection-mode reader-specific	Typical detection-performance with SIR-2720	Typical detection-performance with SIR-2010
ISO 15693 / Philips SLI-2	Iso-card 86*54mm	100% / ASK	450 mm	350 mm
ISO 15693 / Philips SLI-2 (Sokymat LOGI 161)	16mm diameter hard-cover	100 % / ASK	150mm	120mm

5 ELECTRICAL CHARACTERISTICS (TECHNICAL DATA)

Bezeichnung	Einheit	Typ.
working - frequency	MHz	13,56
maximum allowed HF-power @ 13MHz	Watt	2,0
antenna Q-factor		28-30
bandwidth	kHz	470 1)
input - impendance	Ohm	50
SWR –value	----	≤ 1,3 2)
antenna – connector	----	SMA-female / 50Ω
antenna cable-type (optional available)	----	RG 174
working temperature	° C	-10 bis 60

1)
typical values measured in undisturbed surround-behaviours to the antenna and minimum 1,5 meters away from any metal influence to this antenna curcuit and at a temperature of 25 °C .
The values are measured via a filter-analysis diagnostic function of a network analyser and a special sensing-coil at the input of this analyser by the following set-up of the analyser:

Netzwork-analyser:	Anritsu MS 4630 A
Sensing coil:	wideband measuring coil
Set-up of the Anritsu MS 4630 A:	Center- Frequency 13,56 MHz
	Span 5,00 MHz
	RBW ≤ 300 Hz

2)
measured with scemtec´s SWR - measurement -bridge Diamond SX-200.

6 DIMENSIONS OF MID-RANGE-ANTENNA

	length	width	hight
complete pcb-antenna	300 mm	250 mm	7 mm
relevant field-distributing antenna-area	250mm	220mm	------

7 RELATED DOCUMENTS

scemtec´s specification of mid-range reader-system SIR-2010 and SIR-2720

8 DOCUMENT HISTORY

Rev 0.01 / 07.04.2011 / created by M.Radermacher

Manual and Specification

SAT-A40-LR-O-13MHz / Long Range Antenna

scemtec®
Transponder Technology GmbH

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Dokument-Nummer **0000.000.040**				
Projektleiter Michael Radermacher	Entwicklungsleiter Jürgen Kalbitzer	Geschäftsführer Rudolf Schmitz		

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Important Notice :

As with all electronic systems, the system described hereafter may also not be used for any applications critical for maintaining safety. This means, the products may not used in life support applications or any other life critical applications that could involve potential risk of death, personal injury or severe property or environmental damage. The user/operator is solely responsible for any damages resulting from an improper or unintended utilization of the system.

2 functional describtion

With the **SAT-A40-LR-O-13MHz** antenna in combination and directly connected to one of the ***scemtec*** reader-systems SIR-27x0, SHL-21xx or SIR-26xx the detection of different ISO-15693 passiv transponders within reading- and writing-range of data at a working resonance-frequency of 13,56MHz is possible.

The **SAT-A40-LR-O-13MHz** antenna directly connected to one of the ***scemtec*** reader-systems SIR-27x0, SHL-21xx or SIR-26xx and in combination with ***scemtec´s*** applicative demonstration-software on a note-book or PC the user is able of data exchange between the passiv transponders and the reader-system.
The required interface-comands for the data exchange between the demonstration-software and over the reader-system to the transponders in detection range to the antenna are applicated in ***scemtec´s*** software-specification „ STX / ETX Protocol “ .

2.1 Label:

The **SAT-A40-LR-O-13MHz antenna** is applicated with the following label (identification plate) located in the middle of the aluminium-case for the electronics:

scemtec Transponder Technology GmbH
www.scemtec.com
SAT-A40-LR-O-13MHz
Art.Nr.:400.4020 Serien-Nr.: 0016

3 technical data

3.1 technical behaviours:

denotation	unit	Typical-value
resonance - frequency	MHz	13,560 1)
max. rated power @ 13MHz	Watt	5,0
Q-factor		35 1) (+/- 10%)
bandwidth	kHz	399 1)
impedance	Ohm	50 (+/- 5 Ω)
SWR - value		≤ 1,8 2)
IP-class		IP 65
antenna cable		RG 58 / MIL-C17
cable length	meter	4,0
cable-connector		BNC 50Ω
temperature working-area	degree	0°C bis 50°C

1)
Typical values were measured at absolute undisturbed environment of the antenna-area with a min. distance to all metallical objects of 1,5 meter , at normal room-temperature of 25°C .
The measurement-values were detected with a filter-analysis program of a network-analyser and a sensing-coil with a characteristically high bandwith at the input of the network-analyser due to the following settings :

network-analyser:	Anritsu MS 4630 A	
sensing-coil:	sensing-coil with a characteristically high bandwith	
settings at Anritsu MS 4630 A:	center- frequency	13,560 MHz
	span	05,000 MHz
	RBW	≤ 300 Hz

2)
measured with SIR-2720 Mid range reader-system and SWR-Bridge Diamond SX-200

3.2 mechanical values:

denotation	length	width	hight
overall dimension	450mm	400mm	71mm
only antenna-winding	400mm	400mm	∅ 20mm
only aluminium-case	142mm	117,5mm	71mm
cable length	4 meter		