April 2015
Version 1.07

Scintec Flat Array Sodars

Hardware and Maintenance Manual

SFAS, MFAS, XFAS

including RASS RAE1
and windRASS

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Table of contents

Important User Information

Note on this Manual:

This manual is intended for customers who have purchased a Scintec Flat Array Sodar with or without the RASS or windRASS Extension. A careful reading of this manual is important in the proper use and safe operation of the Scintec Flat Array Sodar.

Safety Considerations:

During operation, Scintec Flat Array Sodars emit strong sound pulses in the audible frequency range which may be harmful to the human ear in the vicinity of the acoustic antenna. Therefore:

- Never approach the acoustic antenna without sufficient ear protection.
- Even with ear protection, never let your head be within ±45° zenith angle (i.e. the main emission direction) above the acoustic antenna and a distance less than 10 m.
- Wear sufficient ear protection if within the ±45° zenith angle (i.e. the main emission direction) above the acoustic antenna and a distance of 10 to 100 m.
- Without sufficient ear protection, always observe a minimum safety distance of 10 m.
- Never operate the sodar in closed rooms with the exception of special facilities and with everyone wearing sufficient ear protection.

Warranty and Liability:

Scintec guarantees that the product has been thoroughly tested. The warranty included in the conditions of delivery is valid only if the Flat Array Sodar System, and where applicable the RASS Extension or windRASS Extension, has been installed and used according to the instructions supplied by Scintec.

Scintec shall in no event be liable for incidental or consequential damages resulting from the incorrect and faulty use of the product. Note that user modifications of the product might affect the validity of the CE declaration.

Scintec reserves the right to make modifications to the design and technical specifications of its products without prior notice.

1 HARDWARE COMPONENTS

In the following, descriptions and technical specifications of the instruments are given.

1.1 Acoustic antenna

Scintec Flat Array Sodars operate with an active acoustic antenna. This means that the antenna does not only house the transducers and switches, but also contains audio power drivers for emission and audio preamplifiers for reception mode. As emission elements, highly efficient transducers are used. The same elements reconvert the received sound waves into electric signals.

Most of the analog signal processing is performed in the Signal Processing Unit. By the acoustic antenna of the SFAS, the MFAS, and the XFAS, the following analog and digital information is received from or transmitted to the Signal Processing Unit:

- audio signals for emission, rows
- audio signals for emission, columns
- received audio signals, rows
- received audio signals, columns
- operation mode (emission / reception)
- power amplifier stand-by (supply on / off)
- self-test row / column selection

The acoustic antenna is powered by an external power supply (AC converter or battery) of ±12 VDC (SFAS / MFAS) or ±18 VDC (XFAS).

The orientation of the acoustic antenna is defined such that it is horizontally leveled and the "North" sign is pointing in the north direction. The connectors for power supply and signal cables are mounted on the eastward pointing side.
Under normal precipitation conditions, the acoustic antenna can be operated without additional weather protection.
In order to reduce emitted stray noise and to lower the instrument's susceptibility to active and passive environmental noise (including fixed echoes), an acoustic enclosure can be mounted on the acoustic antenna (small enclosure) or can be set up around it (large freestanding enclosure).

1.1.1 SFAS dimensions and transducer numbering

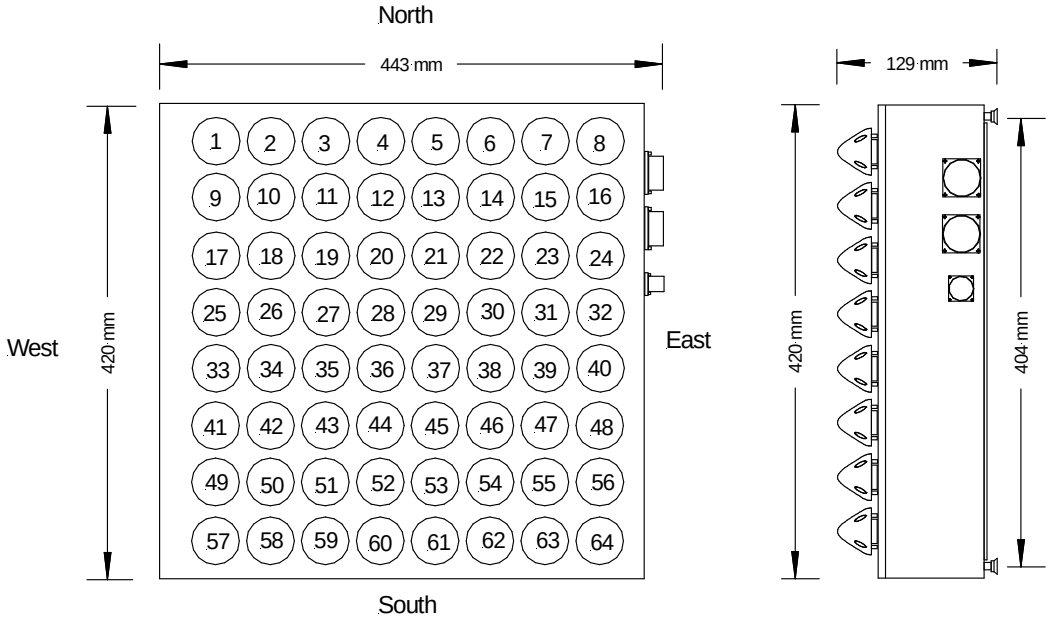


Figure 1: Dimensions and transducer numbering of the Scintec SFAS antenna

1.1.2 MFAS dimensions and transducer numbering

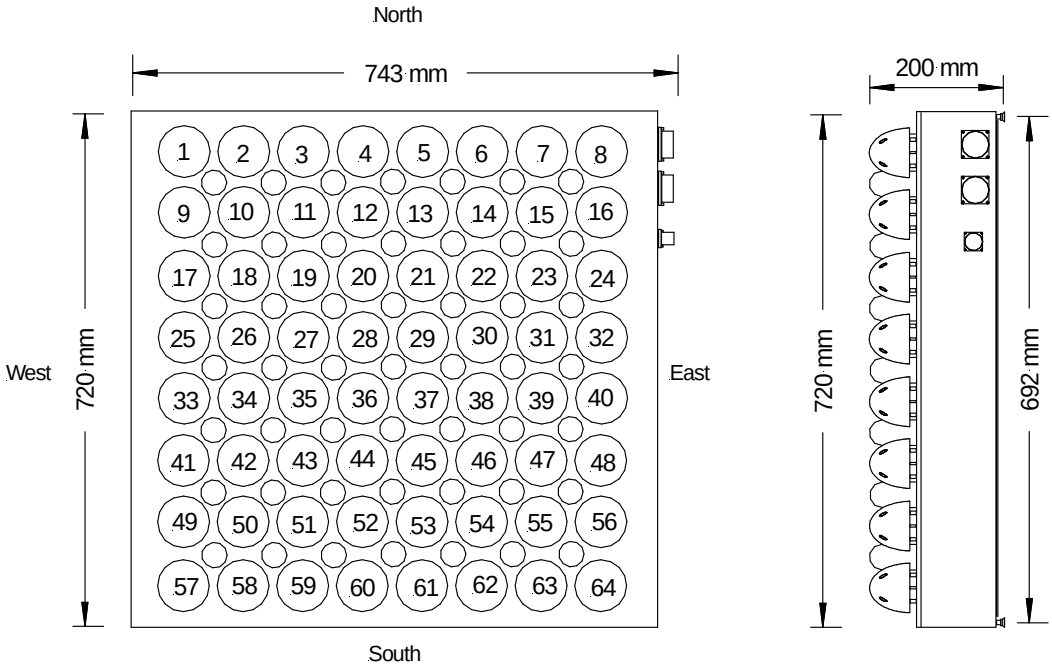


Figure 2: Dimensions and transducer numbering of the Scintec MFAS antenna

Transducer board numbering for SFAS and MFAS	
Transducer board	**Transducers**
Type A	28, 29, 36, 37
Type B	20, 21, 27, 30, 35, 38, 44, 45
Type C	19, 22, 43, 46
Type D	12, 13, 26, 31, 34, 39, 52, 53
Type E	11, 14, 18, 23, 42, 47, 51, 54
Type F	10, 15, 50, 55
Type G	4, 5, 25, 32, 33, 40, 60, 61
Type H	3, 6, 17, 24, 41, 48, 59, 62
Type I	2, 7, 9, 16, 49, 56, 58, 63
Type J	1, 8, 57, 64

1.1.3 XFAS dimensions and transducer numbering

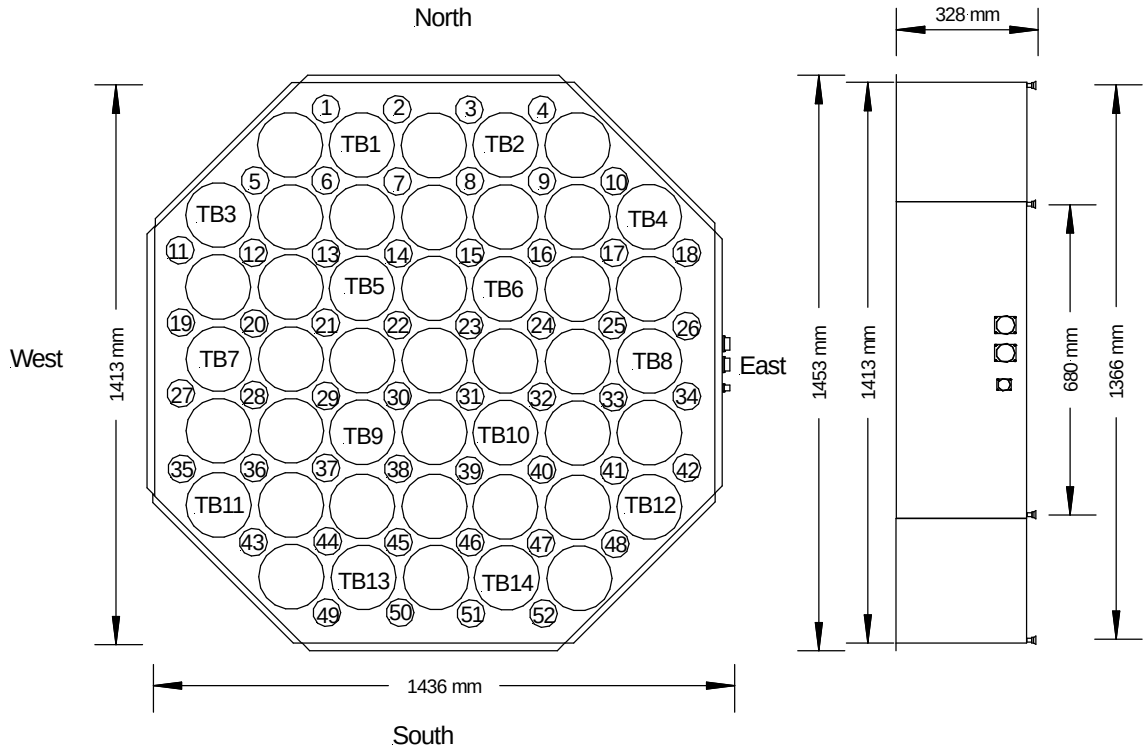


Figure 3: Dimensions, transducer numbering and transducer board (TB) numbering of the Scintec XFAS antenna

1.2 Connectors

1.2.1 Connectors to signal processing unit

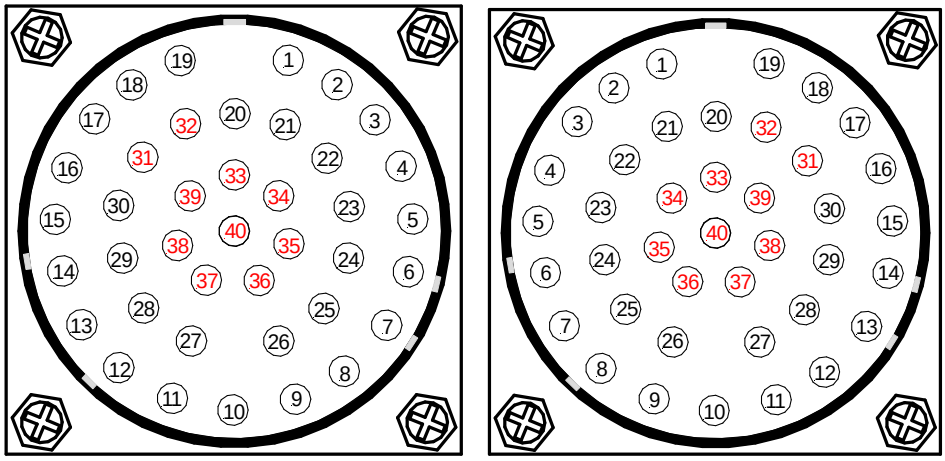
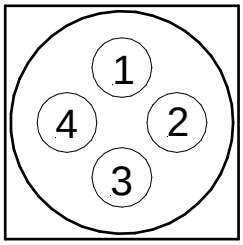


Figure 4: Connectors at the acoustic antenna. Left: Male, Right: Female

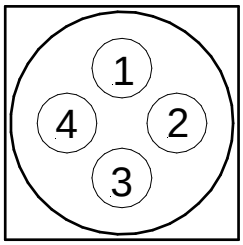
Signal cable pin schemes			
Male		Female	
Pin #	Function	Pin #	Function
1	TX row 1	1	RX row 1
2	TX col 1	2	RX col 1
3	TX row 2	3	RX row 2
4	TX col 2	4	RX col 2
5	TX row 3	5	RX row 3
6	TX col 3	6	RX col 3
7	TX row 4	7	RX row 4
8	TX col 4	8	RX col 4
9	TX row 5	9	RX row 5
10	TX col 5	10	RX col 5
11	TX row 6	11	RX row 6
12	TX col 6	12	RX col 6
13	TX row 7	13	RX row 7
14	TX col 7	14	RX col 7
15	TX row 8	15	RX row 8
16	TX col 8	16	RX col 8
17	SFAS/MFAS: +12V XFAS: +18V	17	Switch TX/RX row 1
18	SFAS/MFAS: +12V XFAS: +18V	18	Switch TX/RX row 2
19	SFAS/MFAS: +12V XFAS: +18V	19	Switch TX/RX row 3
20	GND	20	Switch TX/RX row 4
21	GND	21	Switch TX/RX row 5
22	GND	22	Switch TX/RX row 6
23	SFAS/MFAS: -12V XFAS: -18V	23	Switch TX/RX row 7
24	SFAS/MFAS: -12V XFAS: -18V	24	Switch TX/RX row 8
25	SFAS/MFAS: -12V XFAS: -18V	25	SFAS/MFAS: GND XFAS: signal GND
26	+12V TX	26	Shading
27	+12V TX	27	SFAS/MFAS: GND XFAS: signal GND
28	GND	28	SFAS/MFAS: GND XFAS: signal GND
29	SFAS/MFAS: +12V XFAS: +18V	29	SFAS/MFAS: GND XFAS: signal GND
30	SFAS/MFAS: -12V XFAS: -18V	30	SFAS/MFAS: GND XFAS: signal GND
31 .. 40	Not connected	31 .. 40	Not connected

1.2.2 Connectors to Sodar power supply

Pin connection scheme for SFAS/MFAS (male)	
Function	**Pin**
Supply +12 VDC	1
Supply 0 VDC (Gnd)	2
Supply -12 VDC	3
Not connected	4

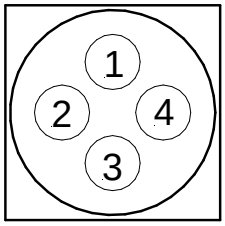


Pin connection scheme for XFAS (male)	
Function	**Pin**
Supply +18 VDC	1
Supply 0 VDC (Gnd)	2
Supply -18 VDC	3
Not connected	4



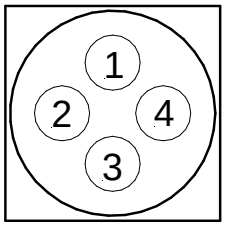
1.2.3 Connectors to heating power supply SFAS/MFAS

Pin connection scheme (female)	
Function	**Pin**
Heating Supply ~24 VAC	1
Heating Supply ~24 VAC	2
Not connected	3
Not connected	4

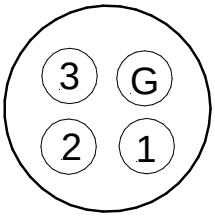


1.2.4 Connectors to heating power supply XFAS

Pin connection scheme (female)	
Function	**Pin**
Heating 1 Supply +18 VDC	1
Heating 1 Supply 0 VDC	2
Heating 2 Supply +18 VDC	3
Heating 2 Supply 0 VDC	4

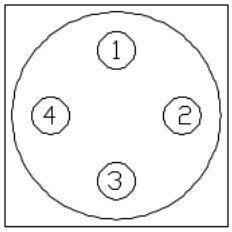


Pin connection scheme (male)	
Function	**Pin**
Heating Switch +12 VDC	1
Heating Switch 0 VDC	2
Not connected	3
Not connected	G



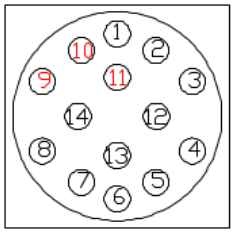
1.2.5 Connector RASS Transceiver to RASS power supply

Pin connection scheme (male)	
Function	**Pin**
Supply Input +14V	1
Supply Input +14V	2
GND	3
GND	4



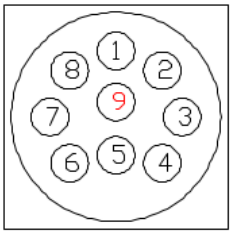
1.2.6 Connector RASS Transceiver to Sodar SPU

Pin connection scheme (male)	
Function	**Pin**
Analog Output „RASS Signal“	1
Analog Output „Crosstalk“	2
Analog Output “Amp Monitor“	3
Analog Output „Supply Monitor“	4
Digital Input „RASS On“	5
Digital Input „Switch to N/S“	6
Digital Input „Switch to E/W“	7
Digital Input „Test Mode On“	8
not connected	9
not connected	10
not connected	11
Supply Input +12V from SPU	12
Supply Input -12V from SPU	13
GND from SPU	14



1.2.7 Connector RASS Transceiver to windRASS controller

Pin connection scheme (male)	
Function	**Pin**
Indicator Input „E/W RX“	1
Indicator Input „E/W TX“	2
Indicator Input „N/S RX“	3
Indicator Input „N/S TX“	4
Digital Output „Switch to N/S“	5
Digital Output „Switch to E/W“	6
Supply Output +12V	7
GND	8
not connected	9



1.3 Signal processing unit

The Signal Processing Unit operates as a slave processor following the instructions from the terminal PC. The Signal Processing Unit performs the following functions:

- Generation of the acoustic emission signals for all 8 rows or columns
- Control of the gain settings of the acoustic antenna
- Control of the direction modes (vertical, East-West, North-South) of the acoustic antenna
- Control of the operation mode (emission / reception) of the acoustic antenna
- Power management of the acoustic antenna
- Analog processing of the received signals
- Analog-to-digital conversion of the return signals from the acoustic antenna
- Combining the return signals of the rows and columns of the acoustic antenna with appropriate phase shifts
- Calculation of the Fourier transforms
- Temporal averaging of spectra
- Serial transmission of spectra to terminal PC

The Signal Processing Unit is connected to the acoustic antenna. All transducers are directly controlled by the Signal Processing Unit. For this purpose the two signal cables are needed. The Signal Processing Unit is supplied with electrical power from the acoustic antenna. The Signal Processing Unit communicates with the terminal PC via an RS232 line. Adapters (RS422 / RS485) can be used to bridge larger distances.

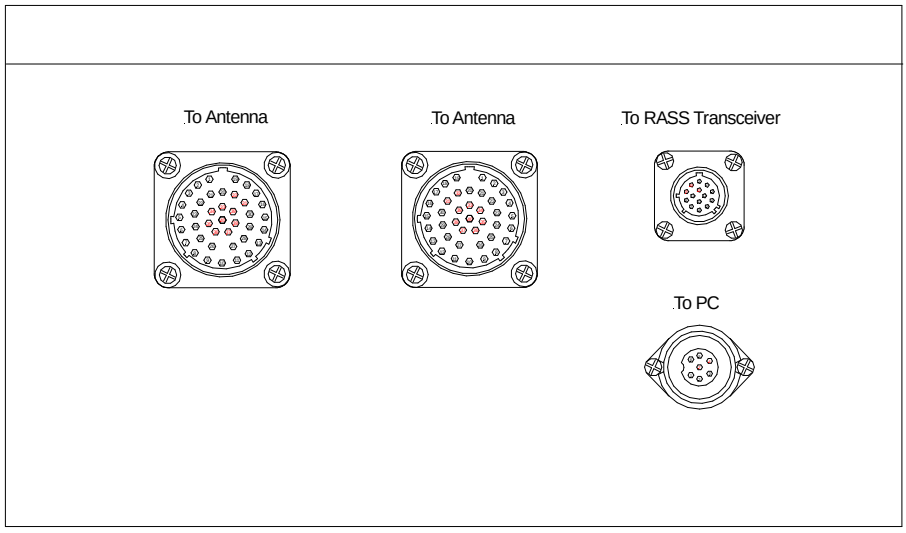


Figure 5: Signal Processing Unit (front view)

1.3.1 RS232 connection cable

The RS232 cable used for the serial communication between the Processing Unit and the terminal PC is configured as follows:

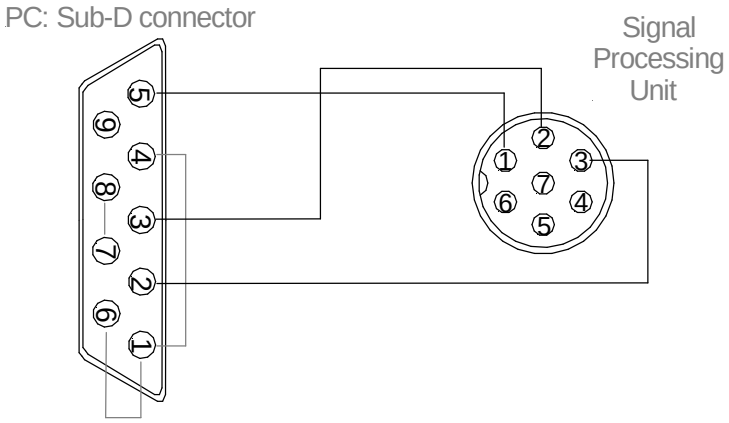


Figure 6: Connection cable between Signal Processing Unit and PC: wiring diagram

1.4 Sodar power supply

1.4.1 SFAS / MFAS

The power supply is an AC adapter to provide the required ±12 VDC output power for the acoustic antenna and Processing Unit. Two LEDs signalize the correct DC voltages. The following AC line voltage versions are available:

115 VAC, 50/60 Hz
230 VAC, 50/60 Hz

Connection schemes see Section 1.2

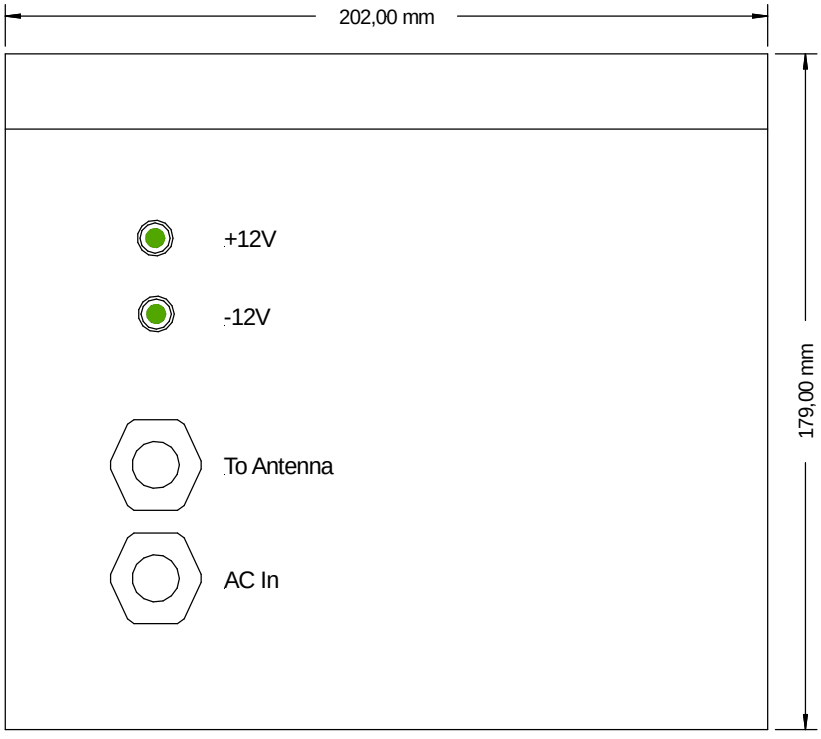


Figure 7: SFAS / MFAS power supply

1.4.2 XFAS

The power supply is an AC adapter to provide the required ±18 VDC output power for the acoustic antenna and Processing Unit. Two LEDs signalize the correct DC voltages. The following AC line voltage versions are available:

115 VAC, 50/60 Hz
230 VAC, 50/60 Hz

Connection schemes see Section 1.2

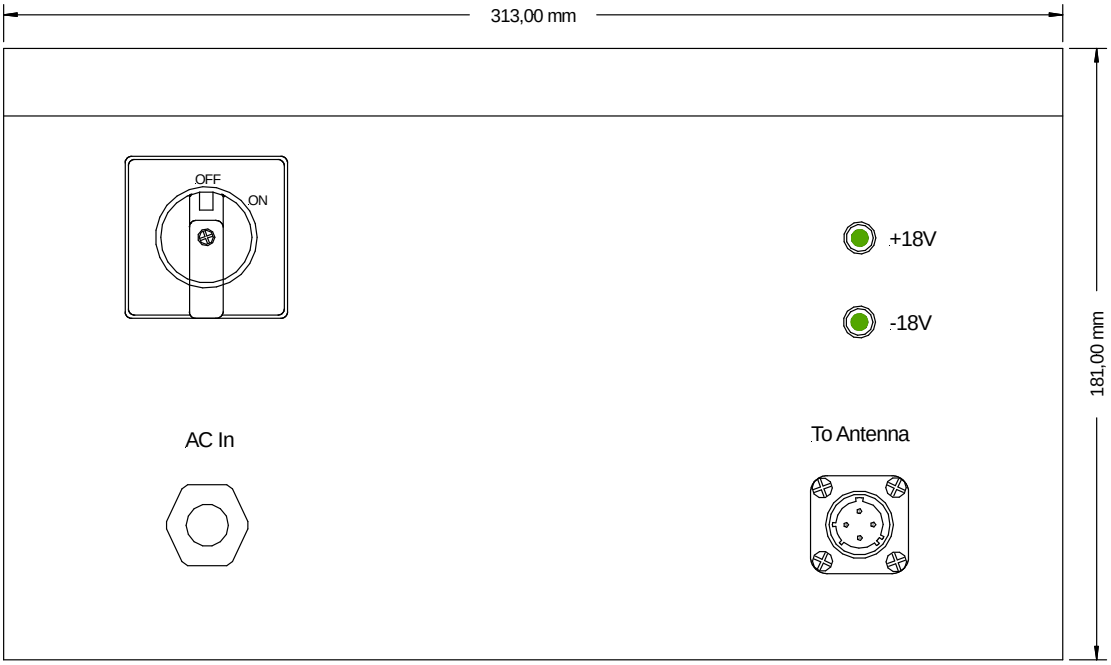


Figure 8: XFAS power supply

1.5 Heating power supply

1.5.1 SFAS / MFAS

The power supply is an AC adapter to provide the required 24 VAC output power for the SFAS or MFAS acoustic antenna heating. The Main LED signalizes the correct AC voltage. The Heating LED is on while heating is active. If the Switch is in the 'Auto' position the heating is automatically controlled depending on the ambient temperature: The heating is started once temperature drops below approx. +10°C. The heating is stopped once temperature gets higher than approx. +20°C. Note, that the thermostat that measures ambient temperature is located inside the Heating Power Supply. Therefore heating conditions will not be detected automatically if the Power Supply is installed in a closed cabinet or shelter. In this case the heating should be manually set to permanent operation during the winter season. The following AC line voltage versions are available:

115 VAC, 50/60 Hz
230 VAC, 50/60 Hz

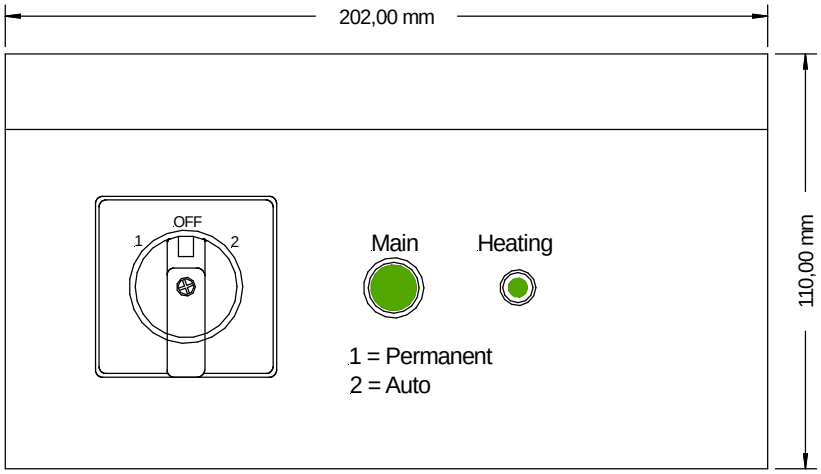


Figure 9: Optional SFAS/MFAS heating power supply (front view)

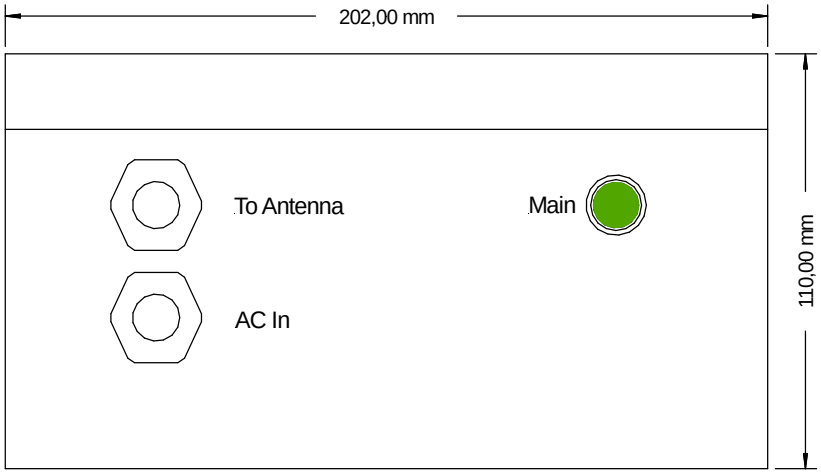


Figure 10: Optional SFAS/MFAS heating power supply (rear view)

1.5.2 XFAS

The power supply is an AC adapter to provide the required +18 VDC output power for the XFAS acoustic antenna heating. The heating supply is separated into two independent supply branches that both have individual LED indicators which are on while heating is active. If the Switch is in the 'Auto' position the heating is automatically controlled depending on the ambient temperature: The heating is started once temperature drops below approx. +4°C. The heating is stopped once temperature gets higher than approx. +12°C. The thermostat that measures ambient temperature is located inside the XFAS acoustic antenna. The following AC line voltage versions are available:

115 VAC, 50/60 Hz
230 VAC, 50/60 Hz

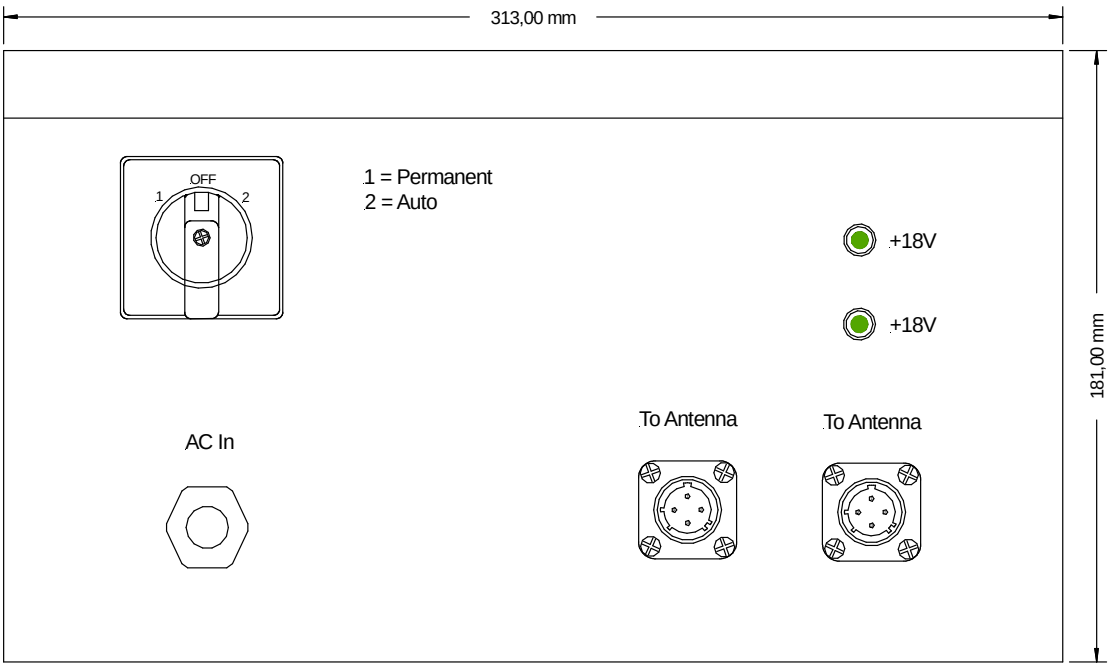


Figure 11: Optional XFAS heating power supply (front view)

1.6 RASS and windRASS components

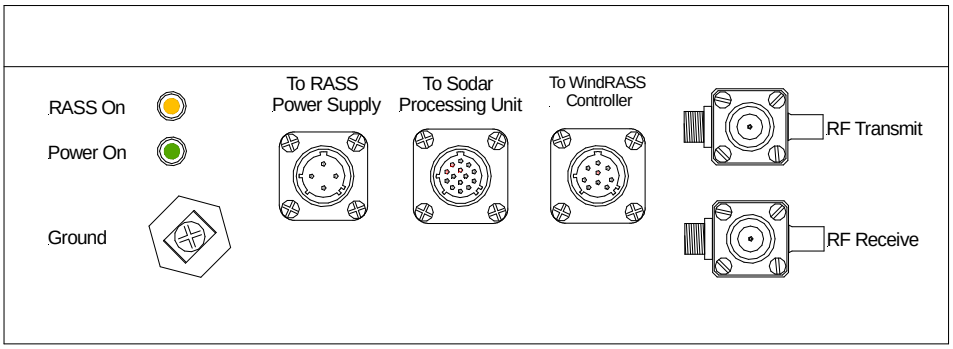


Figure 12: RASS Transceiver

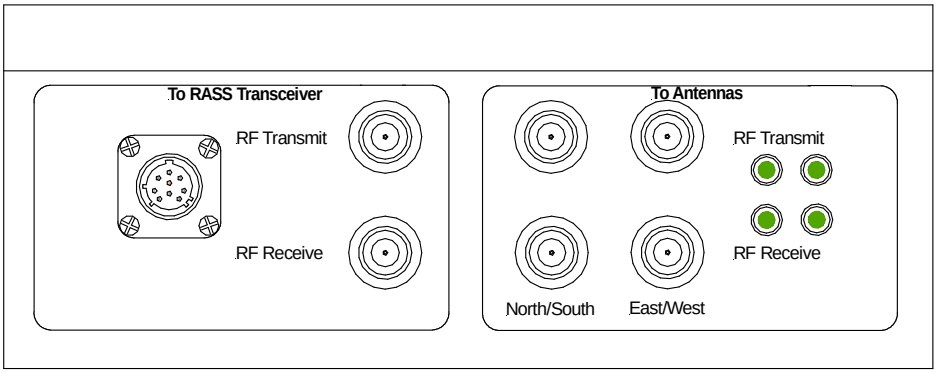


Figure 13: windRASS Controller

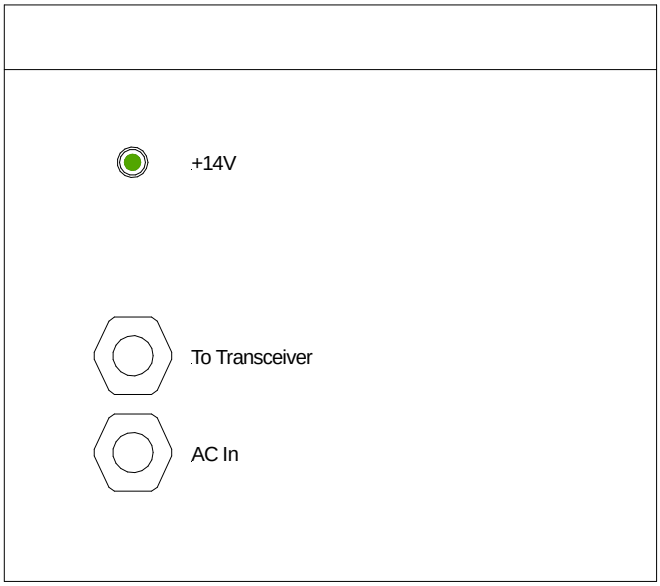


Figure 14: RASS Power Supply

1.7 Enclosure dimensions

1.7.1 Small antenna enclosure

The small enclosure is available for the SFAS and MFAS and is attached directly to the sodar antenna.

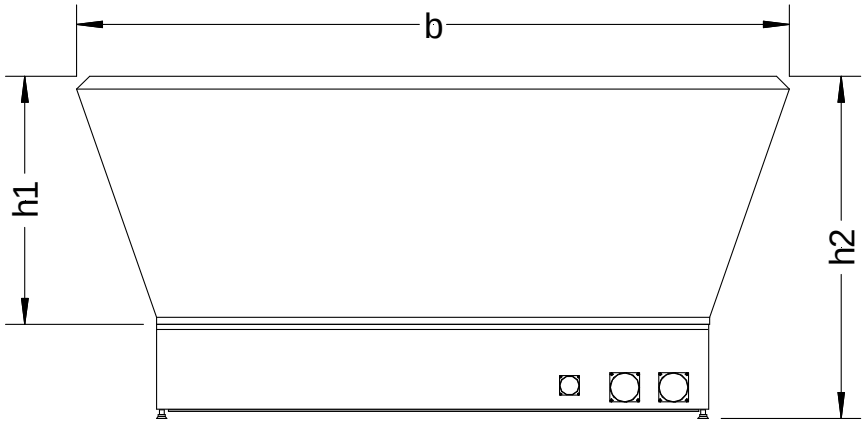


Figure 15: Sodar with mounted small enclosure

Outer dimensions and weight of small enclosure		
Dimensions	**SFAS**	**MFAS**
Number of panels	4	4
b	900 mm	1550 mm
h1	470 mm	770 mm
h2	580 mm	890 mm
Weight	2.2 kg	6.4 kg

1.7.2 Large freestanding enclosure

The large enclosure exists of 16 panels and is placed around the sodar or RASS antenna.

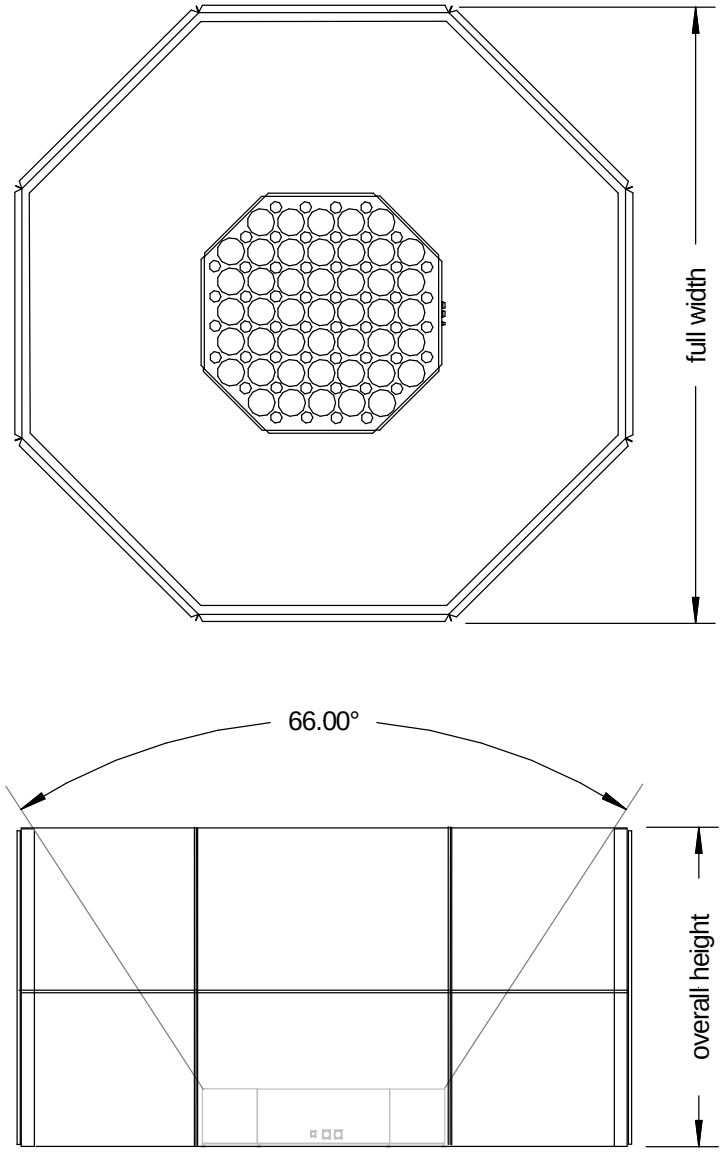


Figure 16: Outer dimensions of a freestanding enclosure (Example: XFAS)

Outer dimensions and weight of large freestanding enclosure			
Dimensions	**SFAS**	**MFAS**	**XFAS or RASS**
Number of panels	8	16	16
Overall height	1200 mm	1720 mm	2000 mm
Full width	1859 mm	3090 mm	3694 mm
Width of each side	770 mm	1280 mm	1530 mm
Weight per panel	6.4 kg	8.2 kg	11.8 kg

1.7.3 Support stand with acoustic enclosure

The support stand is used to elevate the sodar antenna from the ground. The attached electronic compartment is used to store the outdoor units and the enclosure is directly attached to the support stand.
The following table and figure shows the dimensions of the support stand and the acoustic enclosure.

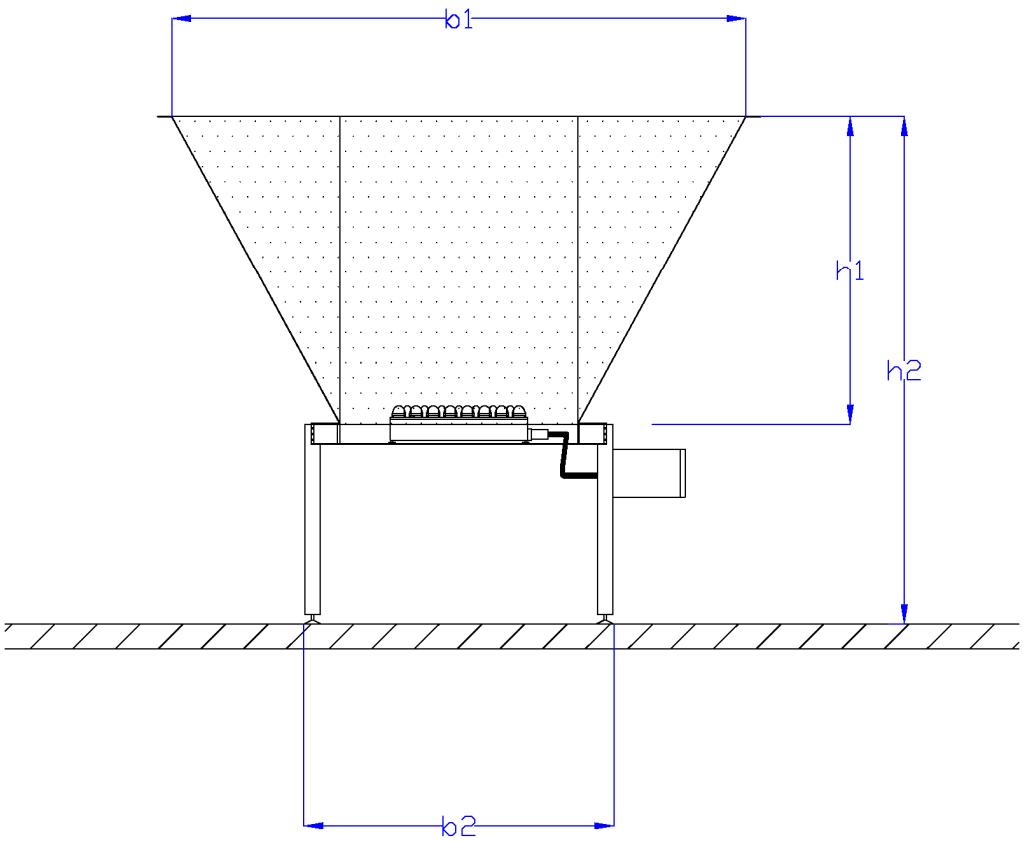


Figure 17: Outer dimensions of the support stand and enclosure (example: MFAS)

Outer dimensions and weight of support stand with enclosure			
Dimensions	**SFAS**	**MFAS**	**XFAS**
Number of panels	8	8	12
b1	1799 mm	3018 mm	3621 mm
b2	1013 mm	1630 mm	1868 mm
h1	1100 mm	1618 mm	2000 mm
h2	2150 mm	2668 mm	2750 mm
Weight per panel corner / side panel	3.1 kg / 6.5 kg	7.5 kg / 15 kg	12 kg / 12 kg
Total weight incl. antenna	107 kg	237 kg	420 kg

2 MAINTENANCE PROCEDURES

Periodic activities should be performed monthly or if necessary, at a more frequent interval. The schedule for performing weather-related maintenance depends on the climatic conditions of the measurement site.

CAUTION	Stop the sodar/RASS measurements before performing any maintenance procedures. Turn of the sodar and RASS power supply.

2.1 Terminal PC

This procedure includes the verification of the latest self-test and the PC performance. The directory path described in this procedure is the default APRun installation path. This procedure can be performed during the measurements. It is not required to stop the sodar operation.

During measurement the data files (and the self-test file) are automatically stored in the 'data' folder of your workspace. The root directory for the workspace is per default C:\APRun.

1. Check if the latest self-test passed. If no self-test was scheduled, perform a complete self-test. See the software manual for more details. If the self-test fails, sent the self-test file and the latest log file to the Scintec technical support.
2. Check if enough space is available on the PC hard disk (C:\). If the hard disk is getting full, backup the measurement data on a portable disk or over a network connection. Remove the saved data to gain space on the hard disk.
3. Check if the performance of the PC is okay. Open the task manager to verify that the CPU usage is normal.

2.2 Enclosure

1. Visually inspect the inside and outside of the enclosure assembly for damage. If necessary, replace all damaged components of the enclosure.
2. Visually inspect the foam inside the enclosure. The foam should be intact and attached to the enclosure panels. Re-attach any loose parts or corners of the foam to the enclosure panels. Replace the foam completely if it is damaged.
3. Visually inspect the guy wires on the enclosure assembly for wear, lack of tension, or damage. Tighten loose guy wires and replace any damaged guy wires.

2.3 Antenna

1. Visually inspect the cables for secure connection of the sodar antenna to SPU. Tighten any loose connections by hand.
2. Visually inspect the cables for secure connection of all (wind)RASS antennas to the RASS transceiver or windRass controller. Tighten any loose connections by hand.
3. Remove any snow, ice, or hail from the sodar and (wind)RASS antennas.
4. Remove leaves and dirt from the sodar antenna.

2.4 Cable connections

1. Visually inspect all the cable connections for secure connection. Tighten any loose connections by hand.
2. Visually inspect all the cables connecting the units, the antennas and the PC. Replace any damaged cables.

2.5 Precautions for use of RF components

The precise connection geometry can be easily disturbed by dirt or other contamination adhering to connector interfaces. When the (wind)RASS extension is not in use, keep the connectors covered. To clean the connector interfaces, use a clean cotton swab, dry or soaked with denatured alcohol. The following are some tips on cleaning connectors:

- Use only denatured alcohol as cleaning solvent.
- Do not use excessive amounts of alcohol.
- Never put lateral pressure on the center pin of the connector.
- Verify that no cotton or other foreign material remains in the connector after cleaning.
- If available, use compressed air to remove foreign particles and to dry the connector.

3 SPARE PARTS

A few parts of the sodar RASS system have a limited life-time. This includes the relays on the XFAS transducer boards and the foam which is part of all the sodar and RASS antenna enclosures.

3.1 Relay

The life-time of the XFAS relays depends on the measurement mode and the operational up-time. A defect relay will not switch correctly between transmission and reception mode. This will result in a reduced performance of the sodar antenna. A defect relay can be recognized from the automatic antenna self-test.

3.2 Enclosure foam

The life-time of the enclosure foam depends on the magnitude and the angle of the incoming solar radiation, which again depends on the latitude of the measurement site:

- 2 years for latitudes <45°N or <45°S,
- 3 years for latitudes between 45° and 60°N or S,
- 5 years for latitudes > 60°N or > 60°S.

Foam that is older than the indicated life-time will affect the measurements. The acoustic absorption will be less effective which results in more disturbance from ground-clutter and ambient noise. Additionally, the foam will crumble and fall off in small dust particles on the ground and on the antenna. The automatic self-test will be affected by this dust and in the worst case the test will fail.

3.3 List of consumables

The following table lists the consumables with their part number.

Table 1: List of consumables

Name	Part no.	Expected life-time
XFAS relay	A101666	3 years in operation
Foam SFAS enclosure small	A081000	2, 3 or 5 years depending on latitude
Foam SFAS enclosure large	A081001	2, 3 or 5 years depending on latitude
Foam MFAS enclosure small	A081002	2, 3 or 5 years depending on latitude
Foam MFAS enclosure large	A081003	2, 3 or 5 years depending on latitude
Foam XFAS or RASS enclosure large	A081004	2, 3 or 5 years depending on latitude

APPENDIX A SPECIFICATIONS

A.1 SFAS

SFAS System		
Description	**Specifications**	**Remarks**
No. of antenna elements	64	piezo-electric
Electric (acoustic) output power	20 W (5 W)	maximum, user selectable
Frequency range	2525 - 4850 Hz	auto-configuration or user-defined
Multi-frequency	yes	
Multi-beam operation	yes, up to 9 beams	
Beam angles	0°, ± 19°, ± 24°	independent of frequency
No. of range gates	100	maximum setting
Vertical resolution	5 m	finest setting
Minimum height	10 m	depending on settings, environment and atmosphere
Maximum height	500 m	
Averaging time	1 - 60 min	user-defined
Accuracy of horizontal wind speed	0.1 to 0.3 m/s	depending on mode, average over varying conditions
Accuracy of vertical wind speed	0.03 to 0.1 m/s	
Accuracy of wind direction	< 1.5°	at wind speeds > 2 m/s
Measurement range of horizontal wind speed	0 to 50 m/s	nominal
Measurement range of vertical wind speed	-10 to 10 m/s	
Operating temperature	-35 to +55°C (-30 to +130 °F)	
Power requirement DC operation	12 or 24 VDC, 20 to 40 W	Average, depending on settings
Power requirement AC line operation	100 to 240 VAC, 35 to 70 W	Average, depending on settings.
Power requirement antenna heating	24 VDC, 86 W	
SFAS Acoustic Antenna		
Size	44 x 42 x 16 cm	Antenna without Enclosure
Weight	11.5 kg	
SFAS Signal Processing Unit		
Size	60 x 31 x 18 cm	
Weight	17 kg	
SFAS Power Supply		
Size	23 x 20 x 18 cm	
Weight	10 kg	
SFAS Heating Power Supply		
Size	23 x 20 x 11 cm	
Weight	8.6 kg	

A.2 MFAS

MFAS System		
Description	**Specifications**	**Remarks**
No. of antenna elements	64	piezo-electric
Electric (acoustic) output power	50 W (7.5 W)	maximum, user selectable
Frequency range	1650 - 2750 Hz	auto-configuration or user-defined
Multi-frequency	yes	
Multi-beam operation	yes, up to 9 beams	
Beam angles	0°, ± 22°, ± 29°	independent of frequency
No. of range gates	100	maximum setting
Vertical resolution	10 m	finest setting
Minimum height	30 m	depending on settings, environment and atmosphere
Maximum height	1000 m	
Averaging time	1 - 60 min	user-defined
Accuracy of horizontal wind speed	0.1 to 0.3 m/s	depending on mode, average over varying conditions
Accuracy of vertical wind speed	0.03 to 0.1 m/s	
Accuracy of wind direction	< 1.5°	at wind speeds > 2 m/s
Measurement range of horizontal wind speed	0 to 50 m/s	nominal
Measurement range of vertical wind speed	-10 to 10 m/s	
Operating temperature	-35 to +55°C (-30 to +130 °F)	
Power requirement DC operation	12 or 24 VDC, 25 to 50 W	Average, depending on settings
Power requirement AC line operation	100 to 240 VAC, 45 to 90 W	Average, depending on settings.
Power requirement antenna heating	24 VDC, 220 W	
MFAS Acoustic Antenna		
Size	74 x 72 x 20 cm	Antenna without Enclosure
Weight	32 kg	
MFAS Signal Processing Unit		
Size	60 x 31 x 18 cm	
Weight	17 kg	
MFAS Power Supply		
Size	23 x 20 x 18 cm	
Weight	10 kg	
MFAS Heating Power Supply		
Size	23 x 20 x 11	
Weight	8.6 kg	

A.3 XFAS

XFAS System		
Description	**Specifications**	**Remarks**
No. of antenna elements	52	
Electric (acoustic) output power	500 W (35 W)	maximum, user selectable
Frequency range	825 – 1375 Hz	auto-configuration or user-defined
Multi-frequency	yes	
Multi-beam operation	yes, up to 9 beams	
Beam angles	0°, ± 22°, ± 29°	independent of frequency
No. of range gates	256	maximum setting
Vertical resolution	20 m	finest setting
Minimum height	40 m	depending on settings, environment and atmosphere
Maximum height	> 2000 m	
Averaging time	1 - 180 min	user-defined
Accuracy of horizontal wind speed	0.1 to 0.3 m/s	depending on mode, average over varying conditions
Accuracy of vertical wind speed	0.03 to 0.1 m/s	
Accuracy of wind direction	< 1.5°	at wind speeds > 2 m/s
Measurement range of horizontal wind speed	0 to 50 m/s	nominal
Measurement range of vertical wind speed	-10 to 10 m/s	
Operating temperature	-35 to +55°C (-30 to +130 °F)	
Power requirement DC operation	18 VDC, 75 to 300 W	Average, depending on settings
Power requirement AC line operation	100 to 240 VAC, 200 to 500 W	Average, depending on settings
Power requirement antenna heating	18 VDC, 1040 W	
XFAS Acoustic Antenna		
Size	145 x 145 x 33 cm	Antenna without Enclosure
Weight	144 kg	
XFAS Signal Processing Unit		
Size	60 x 31 x 18 cm	
Weight	17 kg	
XFAS Power Supply		
Size	33 x 22 x 18 cm	
Weight	17 kg	
XFAS Heating Power Supply		
Size	40 x 31 x 18 cm	
Weight	20.8 kg	

A.4 RASS and windRASS extensions

RASS Extension		
Description	**Specifications**	**Remarks**
Radio antenna	parabolic	
Radio frequency	1290 MHz	standard frequency – hardware can be equipped for a customer-specific frequency
Vertical resolution	5 / 10 / 20 m with SFAS / MFAS / XFAS	depending on Sodar model
Minimum range	40 m	depending on settings, environment and atmosphere
Maximum range	600 / 800 / 1000 m	
Averaging time	1 – 60 min	user-defined
Accuracy	0.2 °C	virtual temperature
Measurement range	-50 °C to +60 °C	
Operating temperature	-35 to +55°C (-30 to +130 °F)	
Power requirement DC operation	+14 VDC, 7A	depending on mode
Power requirement AC line operation	100 to 240 VAC, 500 W	

windRASS Extension		
Description	**Specifications**	**Remarks**
Radio antenna	dual-bar antenna	for easy disassembly for transport
Radio frequency	1290 MHz	standard frequency – hardware can be equipped for a customer-specific frequency
Vertical resolution	5 / 10 / 20 m with SFAS / MFAS / XFAS	depending on Sodar model
Minimum range	40 m	depending on settings, environment and atmosphere
Maximum range	600 / 800 / 1000 m	
Averaging time	1 – 60 min	user-defined
Accuracy of horizontal wind speed	0.3 to 0.5 m/s	depending on mode, average over varying conditions
Accuracy of temperature	0.2 °C	virtual temperature
Measurement range	-50 °C to +60 °C	
Operating temperature	-35 to +55°C (-30 to +130 °F)	
Power requirement DC operation	+14 VDC, 7A	depending on mode
Power requirement AC line operation	100 to 240 VAC, 500 W	

RASS Signal Characteristics		
Description	**Specifications**	**Remarks**
Radio frequency	1290 MHz	standard frequency – hardware can be equipped for a customer-specific frequency
RF Bandwidth (-3dB, 82% of the power)	0.8 MHz	
RF Second harmonic	< -40 dBc	
Occupied RF bandwidth (99% of the power)	1.2 MHz	
RF Receiver type	Direct down conversion	
RF Frequency stability	10 ppm	
Acoustic frequency in RASS mode	2570 – 3150 Hz	

RASS Transceiver		
Description	**Specifications**	**Remarks**
Size	60 x 31 x 11 cm	
Weight	16 kg	
RASS Power Supply		
Size	23 x 20 x 18 cm	
Weight	10 kg	
windRASS Controller		
Size	28 x 23 x 11 cm	
Weight	4.5 kg	
windRASS dual-bar Antenna		
Size	15 x 253 x 4 cm	Without support stand
Weight	6 kg	Without support stand

APPENDIX B DECLARATION OF CONFORMITY

DECLARATION OF CONFORMITY
according to EN 45014

Name and address of manufacturer:

Scintec AG
Wilhelm-Maybach-Str. 14
72108 Rottenburg
Germany

We declare that the products

Acoustic Wind Profilers

Models
Sodar SFAS, Sodar MFAS, Sodar XFAS

and

Acoustic Wind Profiler Extensions

Models
RASS RAE1, windRASS *

comply with the Electromagnetic Compatibility Regulations (EMC) and as far as applicable with the Low Voltage Directive (LVD) of the European Community.

Conformity is guaranteed for delivered complete system and independently operable components. This declaration does not refer to systems resulting from an integration of external components such as data loggers, PCs, power supplies, cable, etc. by others than the manufacturer.

Applicable norms and standards:

EN 50081-1/2,
EN 50082-1/2,
EN 55022:1998 Class B,
EN 60555-2/3, A1:1991,
EN 55014,
IEC 801-1 (1988), IEC 801-2 (1991), IEC 801-3 (1984),
CCITT K20.

* For RASS RAE1 and windRASS additional country-specific regulations for radio frequency emissions may apply.