

**Scintec Flat Array Sodars**

# **Installation and Operation Manual**

**SFAS, MFAS, XFAS**

including RASS RAE1  
and windRASS



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## Table of contents

<b>1</b>	<b>INSTALLATION GUIDE.....</b>	<b>1</b>
1.1	<b>Sodar .....</b>	<b>1</b>
1.1.1	SFAS packing list.....	1
1.1.2	MFAS packing list.....	1
1.1.3	XFAS packing list.....	2
1.1.4	Installing the Sodar components.....	2
1.1.5	DC power adapter for SFAS and MFAS.....	4
1.1.6	Note on electrical installation of Sodar XFAS.....	4
1.2	<b>RASS extension .....</b>	<b>5</b>
1.2.1	Packing list .....	5
1.2.2	Assembly of the RASS antennas.....	5
1.2.3	Installing the RASS components.....	8
1.2.4	Dimensions of Sodar/RASS configurations .....	9
1.3	<b>windRASS extension .....</b>	<b>11</b>
1.3.1	Packing list .....	11
1.3.2	Assembly of the windRASS antennas.....	11
1.3.3	Installing the windRASS components .....	14
1.4	<b>Assembly of enclosures.....</b>	<b>17</b>
1.4.1	Fix the sound absorbing foam for small and large enclosure.....	17
1.4.2	Small antenna enclosures.....	17
1.4.3	Large freestanding enclosures.....	18
1.4.4	Enclosure with support stand.....	19
<b>2</b>	<b>OPERATION.....</b>	<b>21</b>
2.1	<b>Quick reference guide .....</b>	<b>21</b>
<b>APPENDIX A</b>	<b>SODAR/RASS OVERALL DIMENSIONS.....</b>	<b>22</b>
<b>A.1</b>	<b>SFAS with RASS .....</b>	<b>22</b>
<b>A.2</b>	<b>SFAS with windRASS .....</b>	<b>23</b>
<b>A.3</b>	<b>MFAS with RASS .....</b>	<b>24</b>
<b>A.4</b>	<b>MFAS with windRASS .....</b>	<b>25</b>
<b>A.5</b>	<b>XFAS with RASS .....</b>	<b>26</b>

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## **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  $\pm 45^\circ$  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  $\pm 45^\circ$  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 INSTALLATION GUIDE

Within this manual, warnings that may cause human injuries, damaged equipment or erroneous measurements, are indicated by the following symbol:



## 1.1 Sodar

### 1.1.1 SFAS packing list

Quantity	Part ID	Description
<b>System Components</b>		
1	A103889 / A103887	Acoustic antenna without / with heating
1	A103883 / A103884	Sodar Power Supply (optional), EU / US
1	A103893 / A103891	Signal Processing Unit, without / with RASS interface
1	A103881 / A103882	Antenna heating power supply (optional), EU / US
<b>Connection Cables</b>		
2	A102484	Signal cables from antenna to Signal Processing Unit
1	A102577	Serial data cable from Signal Processing Unit to PC
1	A105234	USB to RS232 adapter
<b>Small Enclosure (Optional)</b>		
4	A102648	Metal enclosure sheets
N/A	N/A	Accessories for enclosure
<b>Large Enclosure (Optional)</b>		
8	A102646	Metal enclosure sheets
8	A102735	Guy wires (2 m)
N/A	N/A	Accessories for enclosure
<b>Support Stand with Enclosure (Optional)</b>		
4	-	Metal enclosure sheets side
4	-	Metal enclosure sheets corner
4	-	Guy wires (3 m)
1	-	Support stand with electronic compartment
N/A	N/A	Accessories for support stand

### 1.1.2 MFAS packing list

Quantity	Part ID	Description
<b>System Components</b>		
1	A103869 / A103887	Acoustic antenna without / with heating
1	A103883 / A103884	Sodar Power Supply (optional), EU / US
1	A103873 / A103871	Signal Processing Unit, without / with RASS interface
1	A103881 / A103882	Antenna heating power supply (optional), EU / US
<b>Connection Cables</b>		
2	A102484	Signal cables from antenna to Signal Processing Unit
1	A102577	Serial data cable from Signal Processing Unit to PC
1	A105234	USB to RS232 adapter

<b>Small Enclosure (Optional)</b>		
4	A103530	Metal enclosure sheets
N/A	N/A	Accessories for enclosure
<b>Large Enclosure (Optional)</b>		
8	A102851	Metal enclosure sheets top
8	A102852	Metal enclosure sheets bottom
8	A102764	Guy wires (3 m)
8	A102735	Guy wires (2 m)
N/A	N/A	Accessories for enclosure
<b>Support Stand with Enclosure (Optional)</b>		
4	-	Metal enclosure sheets side
4	-	Metal enclosure sheets corner
4	-	Guy wires (4 m)
1	-	Support stand with electronic compartment
N/A	N/A	Accessories for support stand

### 1.1.3 XFAS packing list

Quantity	Part ID	Description
<b>System Components</b>		
1	A103912 / A103911	Acoustic antenna without / with heating
1	A103915 / A103916	Sodar Power Supply (optional), EU / US
1	A103920 / A103918	Signal Processing Unit, without / with RASS interface
1	A103913 / A103914	Antenna heating power supply (optional), EU / US
<b>Connection Cables</b>		
2	A102484	Signal cables from antenna to Signal Processing Unit
1	A102577	Serial data cable from Signal Processing Unit to PC
1	A105234	USB to RS232 adapter
<b>Large Enclosure (Optional)</b>		
8	A103148	Metal enclosure sheets top
8	A103149	Metal enclosure sheets bottom
8	A102764	Guy wires (3 m)
8	A102735	Guy wires (2 m)
N/A	N/A	Accessories for enclosure
<b>Support Stand with Enclosure (Optional)</b>		
8	-	Metal enclosure sheets side
4	-	Metal enclosure sheets corner
4	-	Guy wires (4 m)
1	-	Support stand with electronic compartment
N/A	N/A	Accessories for support stand

### 1.1.4 Installing the Sodar components



Before installing the sodar system, read the Site Preparation manual first. Some siting aspects could affect the performance of the sodar measurements significantly.

First install the sodar antenna: It must be placed on a stable and even ground or platform.



Avoid using metal (e.g. aluminium, iron) for the platform as this could cause resonances disturbing the return signal. Any metal connected directly or close by the antenna could start "ringing" during transmission mode of the sodar.

An exact horizontal levelling is required (see Site Preparation manual) for correct measurements of the wind velocity components. If possible, the side of the antenna with the "North" label should exactly face to the geographic north direction in order to comply with the direction convention used by the software. Otherwise, you have to enter the actual direction of the antenna north side in the APRun software (see APRun Software Manual). Note that there is a difference between magnetic north and geographic north direction.

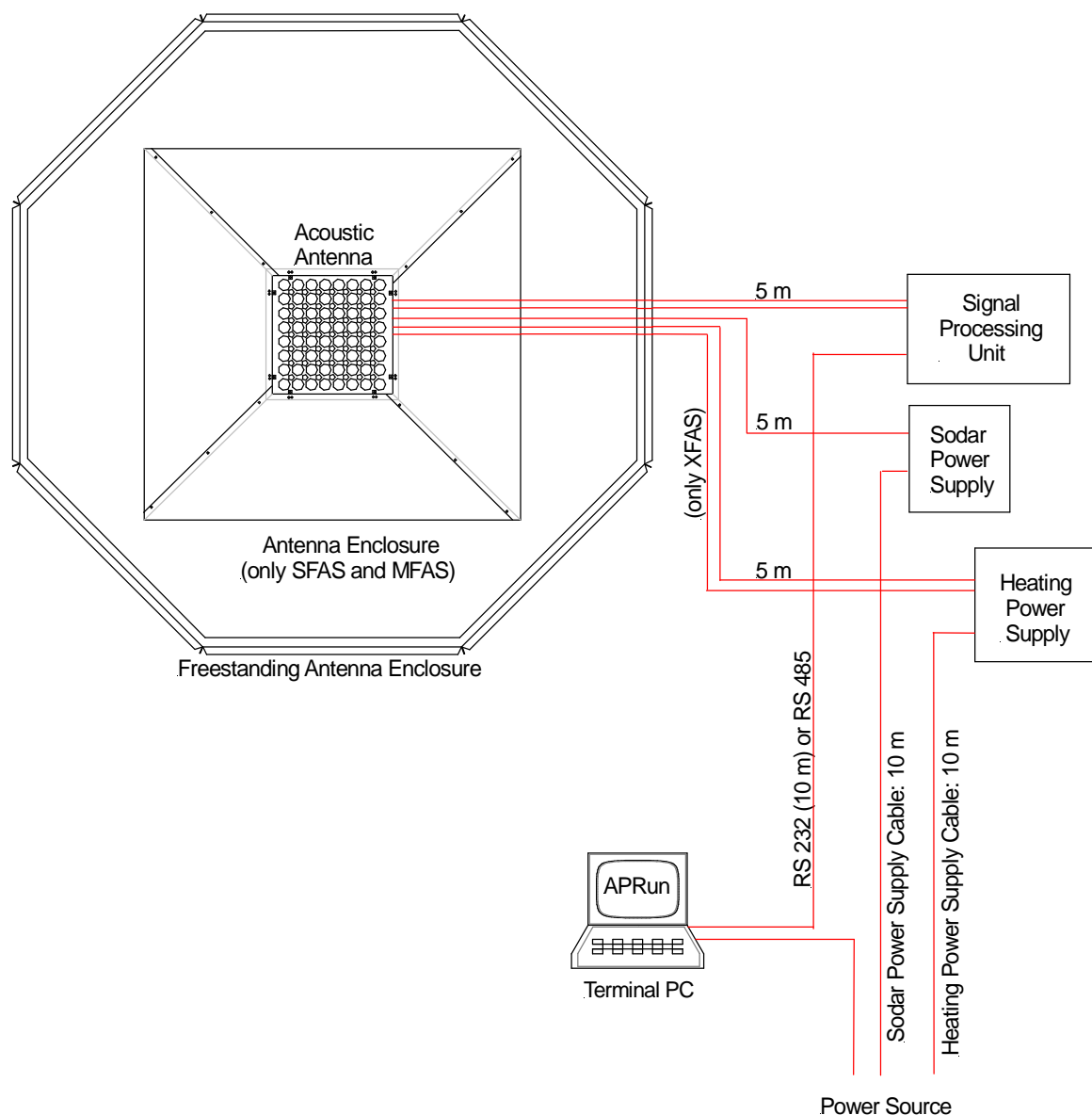
If you use a freestanding acoustic enclosure, the acoustic antenna must be carefully centered within the enclosure. Then install the Processing Unit and power supply. Connect the Processing Unit with the acoustic antenna using the supplied cables.



In hot climates it is required that the processing unit (SPU) and the power supply be shielded from direct sun radiation to avoid overheating. In humid climates, it may be necessary that both units are installed indoors or within an appropriate enclosure to avoid temperature and humidity changes causing condensation within the units.

Provide a terminal PC and connect a RS232 serial port of the PC with the respective port of the Processing Unit. If an optional RS422 or RS485 connection is used, connect the corresponding adapter to the data cable and plug the adapter to preferably the first or second serial port of the terminal PC. Then connect the corresponding power supply of the adapter.

Finally connect the power supply unit to the acoustic antenna. Alternatively, for SFAS and MFAS systems, it is possible to use an optional battery power supply cable to connect the acoustic antenna to appropriate batteries.



**Figure 1: Wiring scheme for Scintec Flat Array Sodars**

After the Processing Unit has been powered on, it will take approximately 1 minute to boot up before being ready for communication with the terminal PC. The system is installed now and ready for operation with the sodar operation software APRun.

### 1.1.5 DC power adapter for SFAS and MFAS

Both SFAS and MFAS systems can be operated using batteries as power sources. The batteries are connected to an Isolating DC Power Adapter (to be ordered separately), which generates a stable output voltage of +VDC and -12 VDC (2x 150 W). The adapter tolerates a wide input voltage between 9 V and 39 V.

### 1.1.6 Note on electrical installation of Sodar XFAS

When installing the XFAS, verify that a proper PE (Protective Earth) at the AC line adapter is provided. If this is not the case, the system may pick up electromagnetic noise, including 50/60 Hz AC line frequencies, which will deteriorate performance.



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## 1.2 RASS extension

### 1.2.1 Packing list

The Scintec RASS extension comprises the following items:

Quantity	Part ID	Description
<b>RASS Components</b>		
1	A104999 / A103876	RASS Transceiver, 915 / 1290 MHz
1	A103874 / A103875	RASS Transceiver Power Supply. EU / US
2	A102123	RF coaxial cable, approx. 9m
1	A102890	Cable Sodar SPU to RASS Transceiver
<b>RASS Enclosure</b>		
8	A103148	Metal enclosure sheets top
8	A103149	Metal enclosure sheets bottom
8	A102764	Guy wires (3 m)
8	A102735	Guy wires (2 m)
N/A	N/A	Accessories for enclosure
<b>RASS Antenna Support Frame</b>		
8	A102924	Aluminum Profile Type 1 (Corner) (length: 500mm, plastic covered adjustable foot, 2 drill holes at one end)
12	A102922	Aluminum Profile Type 2 (Lateral) (length: 670mm, threads on the small front and back faces of the profile)
4	A102907	Aluminum Profile Type 3 (Antenna Support) (length: 670mm, drill hole at 335mm, has 2 lateral cylindrical cavities at each end)
1	A102919	Allen Key
4	A102926	Angle Mounting Part (to fix the antenna support frame to the ground)
4	A102734	Tent pegs
<b>RASS Antenna</b>		
2	A102895 / A106912	Parabolic Antenna Dish, 915 / 1290 MHz
2	A102928 / A106915	Antenna Feed Horn, 915 / 1290 MHz (cylindrical exterior, black, N-connector)
N/A	N/A	Accessories for RASS antenna and support frame

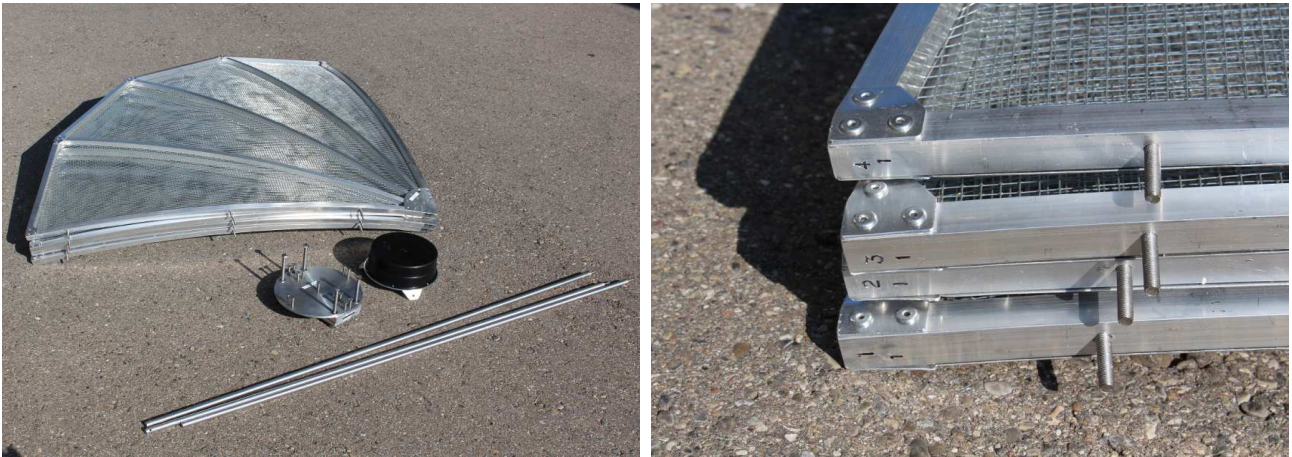
### 1.2.2 Assembly of the RASS antennas

#### A) Antenna assembly (1290 MHz System)

Each parabolic reflector comes with three tubes that end in a M6 bolt on one side and an eyelet on the other side. Connect the eyelets of these tubes to the according three eyelets at the edge of each antenna dish using the provided screws and washers. Then bolt each feed horn to the three tubes on one of the reflectors, using provided washers and M6 butterfly nuts. Please note the orientation of the feed horns and make sure that the antennas are set up such that the feed horns are oriented in parallel.

#### B) Antenna assembly (915 MHz System)

The parabolic reflector for the 915 MHz RASS system is delivered in 4 pieces. Each part is numbered with two numbers; 1 – 4 to indicate the assembly order and 1 and 2 identifying reflector 1 or 2 (see Figure 2). Do not mix up the parts of reflector 1 and 2 as all parts are matched.



**Figure 2: Reflector parts and numbering**

First assemble two pieces together, resulting in two halves of the reflector. Then connect the two halves into one piece. The two round plates are assembled in the center of the parabolic reflector, the single plate on top and the plate with the mounting bracket on the downside (Figure 3).



**Figure 3: Assembly of the mounting bracket**

To connect the feed horn, first connect the eyelets of the tubes to the according three eyelets at the edge of the antenna dish using the provided screws and washers. Then bolt the feed horn to the three tubes on the reflector, using provided washers and M6 butterfly nuts.

Repeat the above instructions for the second antenna which parts are labelled with the number 2.

Please note the orientation of the feed horns and make sure that the antennas are set up such that the feed horns are oriented in parallel.

### **C) Antenna support frame assembly**

Prepare two of the type 2 profiles by pushing two of the half-cylinder-shaped groove stones of the special purpose connector into one of the lateral grooves of each profile. The three different profile types are illustrated in Figure 4. Now fix the type 3 profile to the prepared profiles inserting the special purpose connectors into the cylindrical cavities of the type 3 profile. You should obtain a symmetric H-shaped structure. Follow the same steps to obtain a second H-shaped structure.

Similarly, connect two of the type 1 profiles with one type 2 profile using the provided Allen screws and fixing elements. For each connection between two profiles, assemble an Allen screw and a fixing element (see Figure 6). Turn the screw a few times into the provided matching threads at the end faces of the aluminum profiles. Then slide the opposite profile over the fixing element(s). For each connection, there is a drill hole in the profiles which allows you to reach the screws with the



Allen key. You may find it helpful to fasten the screws tightly only at the end of the assembly process to allow for some flexibility during setup.



**Figure 4: Antenna support frame**

Repeat to obtain two structures (H-shaped with elongated upper part) which attach to the opposite sides of the H-shaped structure obtained in the first step to form a table-like aluminum skeleton. Finally, complete a square at the top of this table using the remaining two type 2 profiles.



**Figure 5: Connecting profiles 2 and 3**



**Figure 6: Connecting profiles 1 and 2**



**Figure 5: Connecting profiles 2 and 3**



**Figure 6: Connecting profiles 1 and 2**

To attach the antennae to the supports, put the parabolic antennae onto the center parts of the upper middle type 3 profiles of each support frame, respectively. Use the U-profile mounting elements, the aluminum plates and the butterfly screws to attach the antenna firmly to the support frames (see Figure 7 for reference).



**Figure 7: Close-up of mounting support**



**Figure 8: Assembled Antenna (1290 MHz)**

### 1.2.3 Installing the RASS components

The basic components of a RASS extension are the two parabolic grid antennas with the support frames, the transceiver and the transceiver power supply unit. The two 9 m RF coaxial cables are used to connect the RASS transceiver to the feed horns of the receiving and transmitting antenna, respectively. Putting the transmitter close to the antenna minimizes losses in the connecting cables. RASS transceiver and transceiver power supply are intended to be operated close to the sodar's signal Processing Unit.

#### A) Positioning

The centers of the RASS antennas and the center of the sodar antenna must form a straight line. The RASS receiver and transmitter antennas are situated at the end of this line with the sodar exactly in the center. We recommend a distance of 8 m between the two antennas. Please determine after setup the distance between the RASS antennas. This distance is a parameter that is needed by the sodar operation software for temperature profile calculations.

#### B) RASS assembly

Align the radar antennas so that both black arrows on the feed horn point in the same direction and are parallel. Then adjust the height of the feet of the mounting support by screwing up or down to obtain horizontal leveling of both antennas. Connect the transceiver (labeled RF OUT) to the feed horn of the transmitting antenna using one of the 9 m RF coaxial cables (see Figure 9). Similarly, connect the transceiver (labeled RF IN) to the feed horn of the receiving antenna using the second 9 m RF coaxial cable. Use the 5 m LF signal cable to connect the RASS transceiver (labeled To SPU) to the SPU (labeled To RASS transceiver).

Put the enclosure around the RASS transmitter antenna so that the antenna is centered inside the enclosure. For assembly of the enclosure, please refer to the instructions applicable to the XFAS enclosure (section 1.4.3) which is mechanically identical.



Avoid over-torqueing connectors. Over-torqueing the connectors is destructive as it may damage the connector center pin. Finger tight is usually sufficient for mating the connectors. Never use pliers to tighten connectors.



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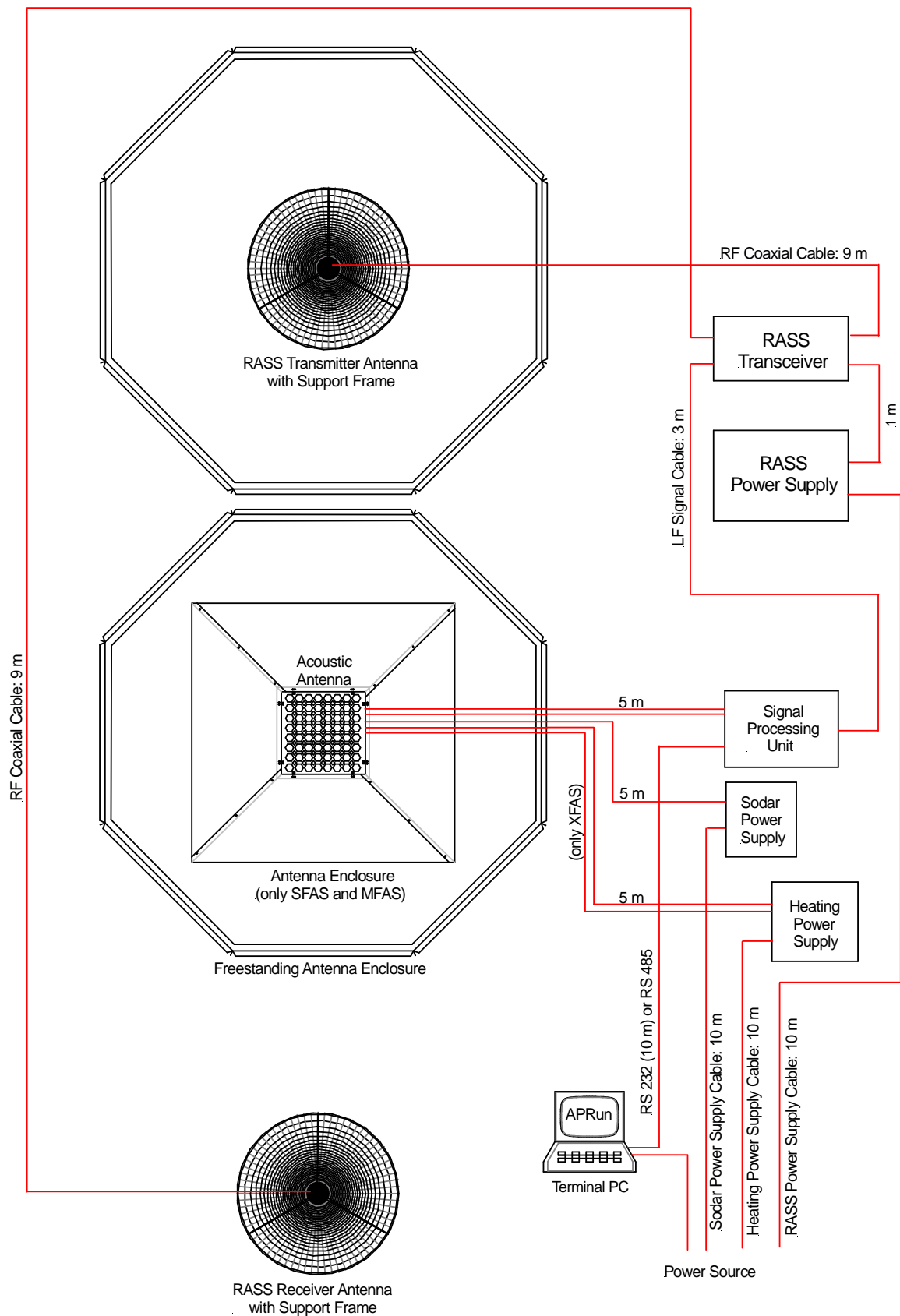
Finally, the power cable from the RASS transceiver power supply must be plugged into a main voltage socket (190~260V, or 110V). Green lights at the RASS transceiver and the transceiver power supply indicate the presence of operating voltage. The yellow LED on the transceiver indicates an ongoing RASS measurement, which is accompanied by the emission of electromagnetic radiation at the transmitter antenna.



For safety, do not stay inside the RASS transmitter enclosure during RASS operation.

#### **1.2.4 Dimensions of Sodar/RASS configurations**

The overall dimensions of the RASS extension combined with the Flat Array Sodars SFAS, MFAS and XFAS are shown in APPENDIX A. For the SFAS and MFAS models, standard and large acoustic antennas are available, respectively, whereas only a large enclosure is available for the XFAS model. The distance between the RASS receiver and transmitter antennas is 8 m, as recommended in the previous section. The center of the sodar antenna is in the middle of a straight line connecting the two RASS antennas. The circles illustrate radii (counted from the center of the corresponding enclosure) at which tent pegs have to be positioned to fix the guy lines to the ground. If permanent installation on solid ground of the Sodar/RASS system is anticipated, it is important to note that the prepared base is broader than the distance between two diametrically opposed guy lines, i.e., 9200 mm.



**Figure 9: Wiring diagram for a Scintec Flat Array Sodar with RASS extension**

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## 1.3 windRASS extension

### 1.3.1 Packing list

The Scintec windRASS extension comprises the following items:

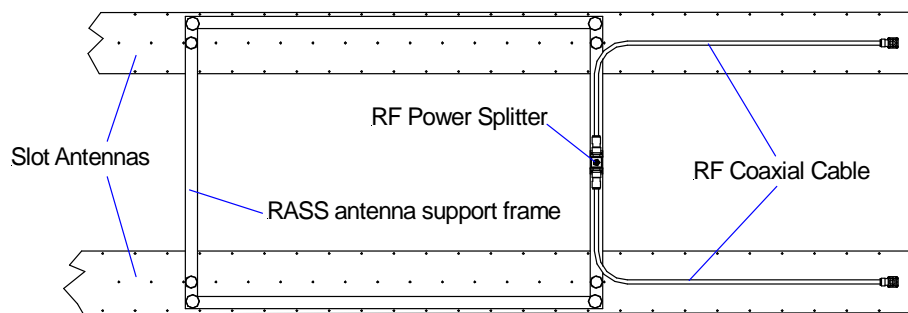
windRASS Components		
Quantity	Part ID	Description
1	A104999 / A103876	RASS Transceiver, 915 / 1290 MHz
1	A103874 / A103875	RASS Transceiver Power Supply. EU / US
1	A103910	windRASS Controller
1	A102891	Cable windRASS Controller to RASS Transceiver
2	A102889	Signal cable, approx. 1m (to connect windRASS Controller to RASS Transceiver)
1	A102890	Cable Sodar SPU to RASS Transceiver
windRASS Antenna Support Frame		
Quantity	Part ID	Description
4	A102870	windRASS Support Frame with feet
4	A102874	RF Power Splitter
8	A102877	Angle mounting part (for fixing support frames to the ground)
16	A102879	Pipe clam (to fix the mounting angles to the support frame legs)
8	A102734	Tent pegs
N/A	N/A	Accessories for support frame
windRASS Antenna		
Quantity	Part ID	Description
8	A105031 / A103885	RASS Slot Antenna, 915 / 1290 MHz
8	A105034 / A102882	HF windRASS antenna cable, 915 / 1290 MHz (to connect two slot antennas to RF Power Splitter)
4	A102123	RF coaxial cable, approx. 9m (to connect RASS antennas to windRASS Controller)

### 1.3.2 Assembly of the windRASS antennas

The windRASS Extension comes with four RASS antenna support frames. Each of these rectangular frames hosts two of the eight slot antennas. Figure 11 gives an overview over the components and several mounting holes of a support frame. For assembling such a frame, proceed as follows:

- Turn the frame upside down and attach the support frame legs to the frame. Each leg is already equipped with a corresponding thread bolt and a foot.
- Attach the RF Power Splitter to the frame (Figure 11). To do so, guide the two shorter ends of the RF Power Splitter through the two mounting brackets (close-up in the lower panel of Figure 11), insert the corresponding screws and screw the RF Power Splitter onto the frame.
- To attach the two antennas to the support frame, put the antennas onto the frame such that the two threads, which are already attached to the antennas, slide into the antenna mounting holes (Figure 11). Ensure that the RF connectors of both antennas point towards the RF Power Splitter. Now, fix the antennas to the frame by using the knurled head screws.

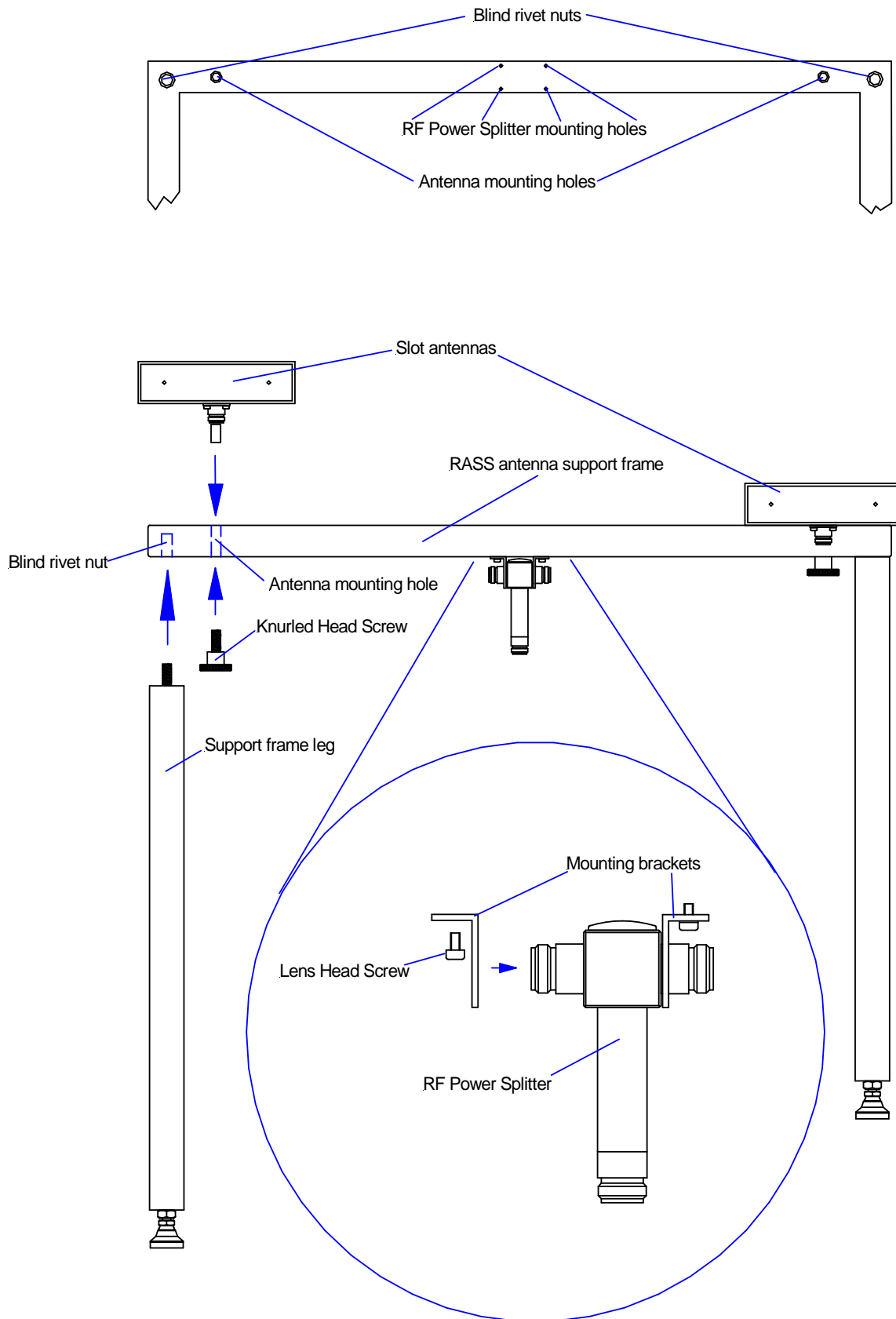
- Connect two RF coaxial cables (length approx. 1m) to the short ends of the RF Power Splitter. The open ends of the RF coaxial cables have to be connected to the RF plugs located on the bottom side of the slot antennas (see illustration below).



**Figure 10: Slot antenna, bottom view**

- Repeat the steps given above to assemble all four RASS antenna support frames.
- The support frames are fixed to the ground with the mounting angles. Slide two of the pipe clamps over one of the legs of the support frame. The mounting angle is attached to both pipe clamps with the corresponding screws (part of the delivery). Now the mounting angle can be fixed to the surface with a suitable type of screw or pin (depending on the surface). Do this for two legs (diagonal) for each support stand.





**Figure 11: Assembling a windRASS antenna with support frame**

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### 1.3.3 Installing the windRASS components

After having assembled the 4 windRASS antennas, the entire system has to be set up. In order to do so, follow the notes given below. An overall configuration and wiring scheme is given in Figure 12.

#### A) Positioning

For both the North-South and the East-West directions, the centers of the two corresponding windRASS antennas and the center of the sodar antenna must form a straight line. This is indicated by the two blue lines as shown in Figure 12. They represent the East-West and the North-South Axis of the complete system, respectively. The windRASS receiver and transmitter antennas for one direction are situated at the end of this line with the sodar exactly in the center of the line. We recommend a distance of 8m between the centers of the two windRASS antennas for one direction. Note that this distance has to be identical for both the North-South as well as the East-West direction. Please determine after setup the distance between the windRASS antennas for each direction. This distance is one of the parameters that determine the lowest measurement height. Together with the geographical offset from North direction of the entire system, i.e., the sodar antenna as well as the 4 windRASS antennas, it must be known to use all capabilities of the sodar operation software to determine precise temperature profiles.

#### B) windRASS antenna alignment

Align the windRASS antennas such that the two windRASS antennas for one direction are as parallel as possible to each other. Then adjust the height of the feet of the windRASS antenna support frame by screwing up or down to obtain the best horizontal levelling of the windRASS antennas.

#### C) Wiring of windRASS extension

The windRASS Extension comes with a set of RF coaxial cables and several LF signal cables for establishing connectivity between individual components and to the components of the sodar system. We recommend the following steps for carrying out the wiring:

- **Establish connectivity between windRASS antennas and windRASS controller**

Connect the four RF coaxial cables with length 9m to the open ends of the RF Power Splitters of the four windRASS antennas. The laying of the cables should be conducted in such a manner that the open ends of the RF coaxial cables cross at one point, where the windRASS controller has to be placed. Now connect the open ends of the RF coaxial cables to the four RF connectors being located in the panel labeled “To Antennas” of the windRASS Controller. The left column of the connector array represents the windRASS antennas used for the RF transmission and reception in North-South direction (labeled “North/South”). The right column represents the two RASS antennas aligned along the East/West axis. As indicated by the LEDs given on the right-hand side of the array, the two upper connectors have to be connected to the RF receiving windRASS antennas, whereas the two lower connectors are used for the RF transmitting windRASS antennas. Make sure that the windRASS antennas aligned along one of the two axes are connected column-wise to the corresponding connectors of the array.

- **Establish connectivity between windRASS controller and RASS transceiver**

Connect the windRASS Controller and the RASS Transceiver by using the two remaining RF coaxial cables with length 1m. Two RF connectors are located in the panel labeled “To RASS Transceiver” of the windRASS Controller: RF Receive and RF Transmit. Matching connectors can be found on the front-side of the RASS Transceiver. Furthermore, use the 1m LF signal cable and plug it in the RASS Transceiver connector labeled “To windRASS Controller”

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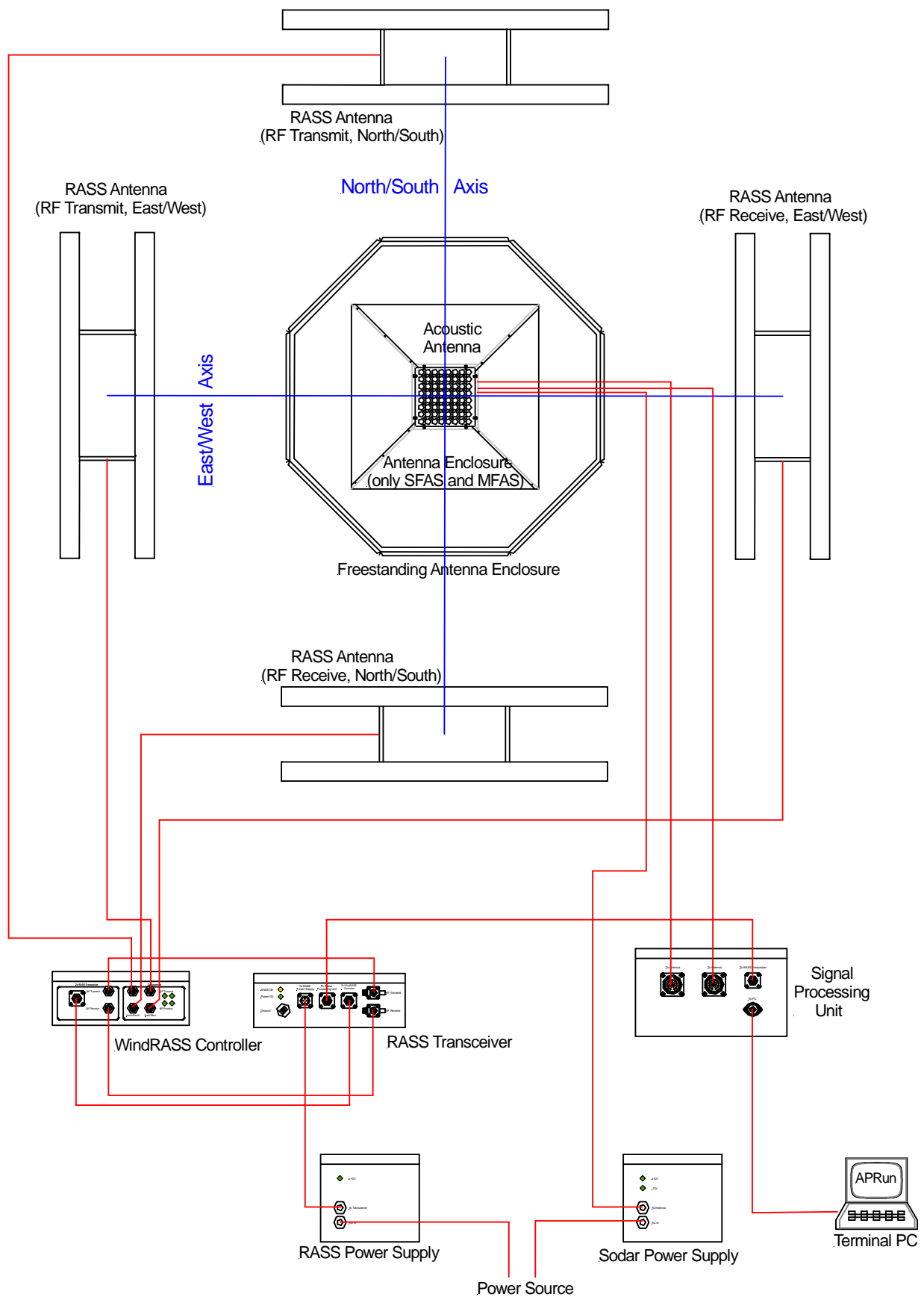
- **Establish connectivity between RASS transceiver and signal processing unit**

Use the 1m LF signal cable to connect the RASS Transceiver (labeled “To Signal Processing Unit”) to the SPU (labeled “To RASS Transceiver”).



Avoid over-torqueing connectors. Over-torqueing the connectors is destructive as it may damage the connector center pin. Finger tight is usually sufficient for mating the connectors. Never use pliers to tighten connectors.

Finally, the 1m cable of the RASS Power Supply has to be connected to the RASS Transceiver and the 10m power cable must be plugged into a main voltage socket (220~240V, or 110V optionally). Green lights at the RASS Power Supply and the RASS Transceiver indicate the presence of operating voltage. The yellow LED on the front-side of the RASS Transceiver indicates an ongoing RASS measurement, which is accompanied by the emission of electromagnetic radiation at the transmitter antennas.



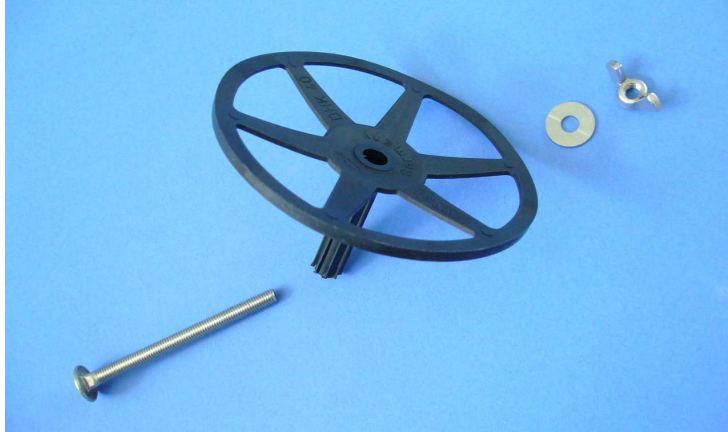
**Figure 12: Wiring diagram for a Scintec Flat Array Sodar with windRASS extension**

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## 1.4 Assembly of enclosures

### 1.4.1 Fix the sound absorbing foam for small and large enclosure

Before assembling the enclosure it is recommended to attach the foam sheet holders. Each ordered small and large enclosure comes with an additional set of holders for the sound absorbing foam sheets. One holder unit consists of a screw, a black circular holder arm, a flat washer and a wing nut (Figure 13).



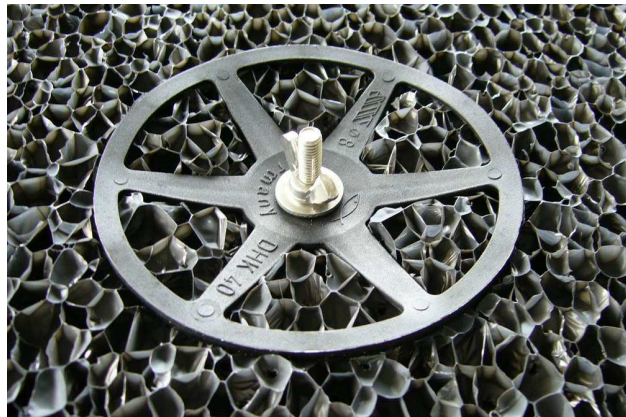
**Figure 13: Components of additional holder unit**

In order to attach a holder to an antenna or a freestanding enclosure, proceed as follows:

1. Insert the screw into the prepared hole in the enclosure metal sheet (Figure 14)
2. Put the black holder arm over the screw. The foam sheets are already equipped with corresponding holes.
3. Finally, use the washer and tighten the wing nut (Figure 15)



**Figure 14: Foam screw**



**Figure 15: Attached foam sheet holder**

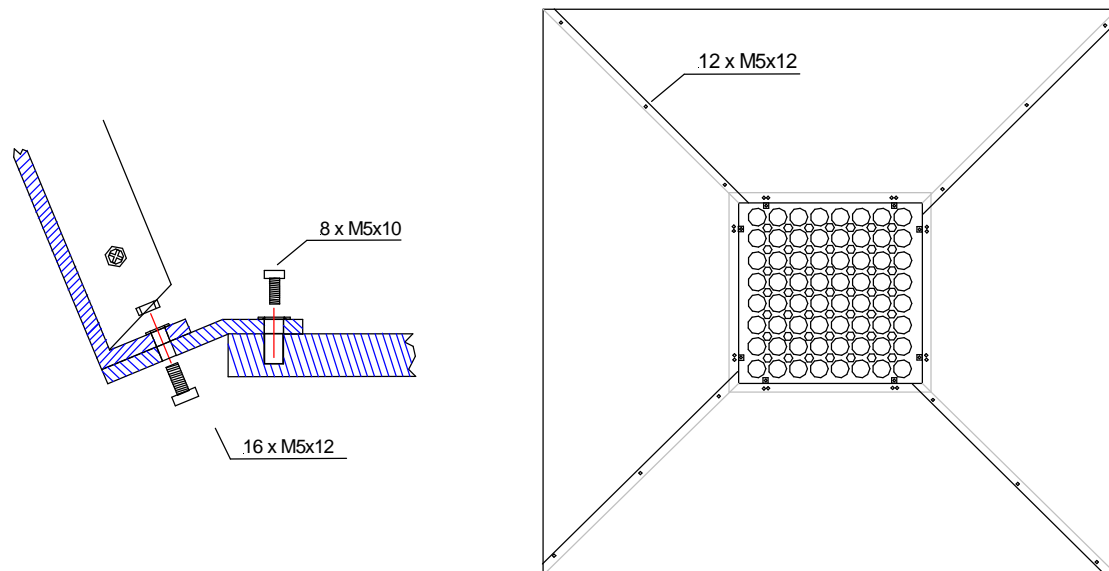


The foam is temporary glued to the enclosure sheets as an assembling aid. After some time the glue will loosen and the foam will be hold by the foam holders only. This could cause the edges of the foam to bend, which does not affect the measurement quality.

### 1.4.2 Small antenna enclosures

The small enclosures are delivered as four metal sheets. They are coated with sound absorbing foam on one side. First connect the non-parallel sides of two sheets in a way that the short parallel

sides meet in a right angle and on both sheets the foam is on the inside of this angle. The connection is fixed by four (SFAS) or three (MFAS) bolts and nuts. Then add the third and fourth sheet in the same manner and screw together the remaining edges. Put the antenna with the enclosure onto the 12 brackets mounted at the sides of the acoustic antenna and fix it with the screws provided with the enclosure. After assembling an MFAS enclosure, you mount the eight brackets at the sides of the acoustic antenna, then place the antenna on the brackets, adjust its position and attach it to the brackets. The assembly of the MFAS enclosure is illustrated in Figure 16.



**Figure 16: Mounting an antenna small enclosure (Example: MFAS)**

### 1.4.3 Large freestanding enclosures

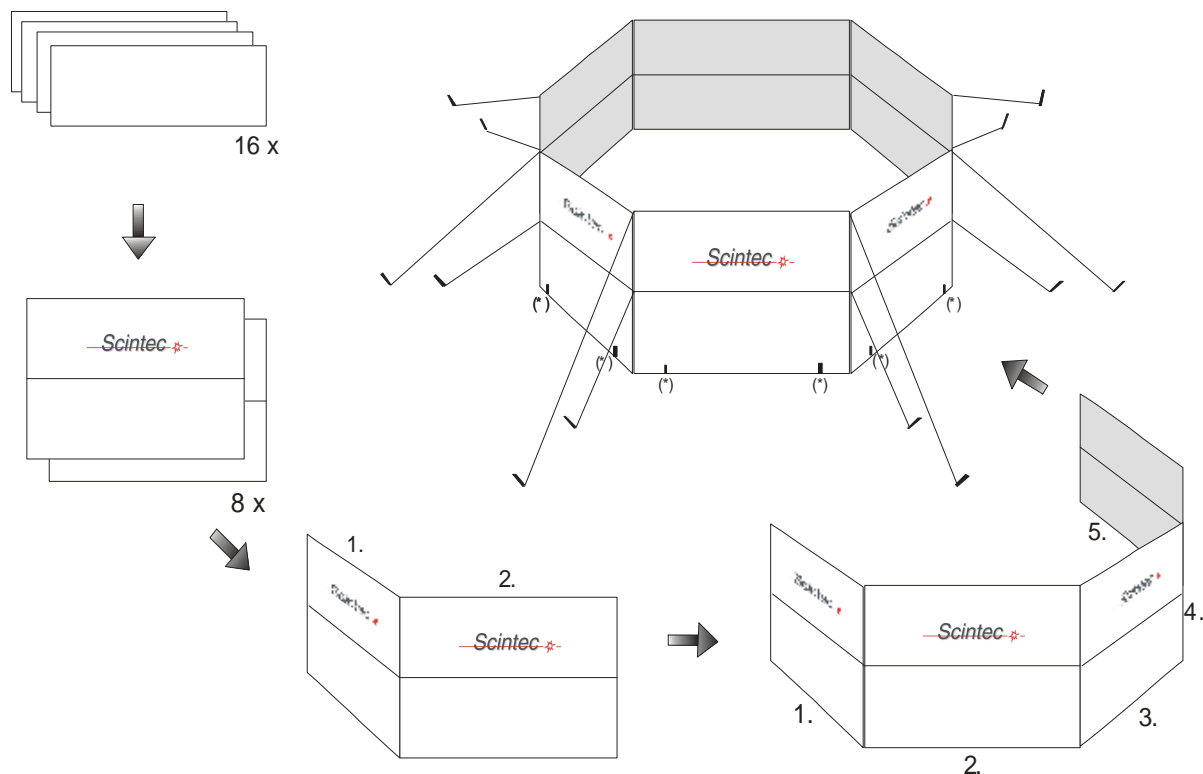
The freestanding enclosures are shipped as 16 (XFAS and MFAS enclosure) or eight (SFAS enclosure) metal panels that are coated by sound absorbing foam on one side. It is recommended to assemble the enclosure with at least three people.

If the enclosure consists of 16 pieces, first connect each of two of the panels by attaching the **longer** edges. Eight of the 16 panels are labeled "Scintec" and these form the upper half of the enclosure. Always connect one labeled panel to one blank panel. The foam-coated sides of both panels point to the interior of the enclosure to be assembled. The connection is accomplished with three (wing) nuts, washers and bolts. This procedure yields eight wall sections as tall as the full height of the enclosure.

With the eight wall sections properly secured proceed as follows: Place two wall sections parallel on the ground with the foam facing downward. The long sides of both wall sections should touch and the "Scintec" labels must be next to each other. Then lift both edges that are in contact together, so that the two wall sections form an angle of 45°. Otherwise the bearings at the sides of the wall sections would be bent when tightening the bolts. Then connect the two wall sections with the bolts. Next erect this first corner. Note that the labels "Scintec" should come on top. Please support the erected parts of the enclosure sufficiently as the unfinished enclosure is rather unstable.

Now add the other wall sections: erect the next wall section at an angle of 45° from the neighboring wall section and secure it with six bolts. Note that the label "Scintec" always has to be on top. Repeat, until the octagon is closed. Note that the acoustic antenna must be exactly centered inside the enclosure. Scintec also recommends that four of the wall sections be parallel to the sides of the acoustic antenna.

Finally, secure the eight corners of the enclosure twice using the tent pegs and guy lines that are shipped with the enclosure. The outcome should look as shown in Figure 17.



**Figure 17: Mounting a freestanding enclosure**



For permanent installation or strong winds, it is necessary to solidly fix all eight lower sheets directly to the ground (see (\*) in Figure 17).



The tent pegs shipped with the enclosure are only for low wind speeds and temporary installation and will not provide sufficient stability in every kind of surface. For example, they cannot be used in sand or mud.

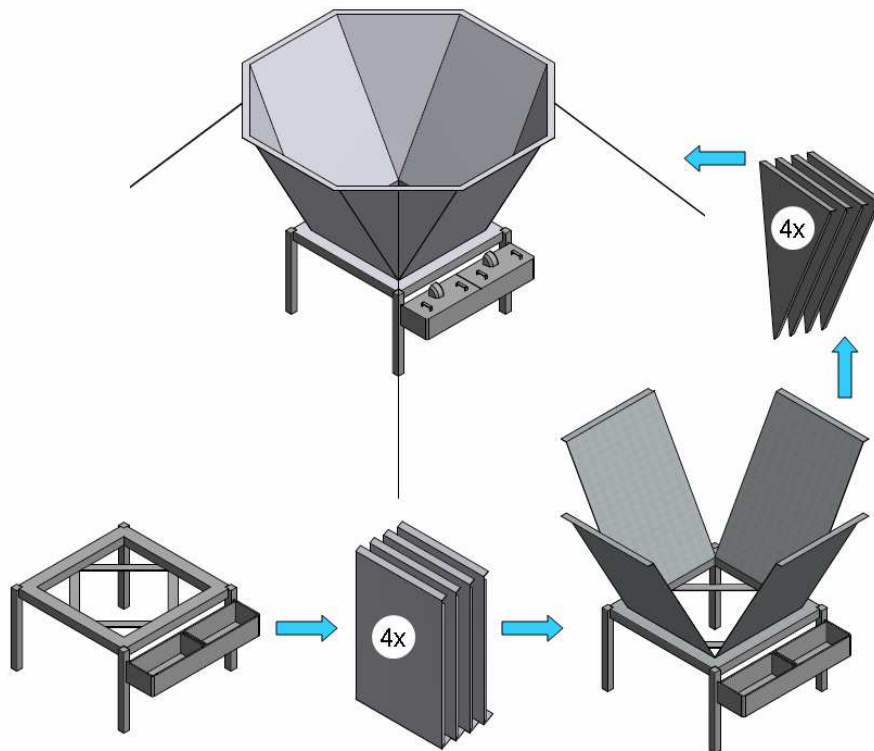
#### **1.4.4 Enclosure with support stand**

First assemble the support stand with the electronic compartment. Level the support stand by adjusting the length of the four legs. The enclosure will be mounted on top of the support stand (Figure 18).

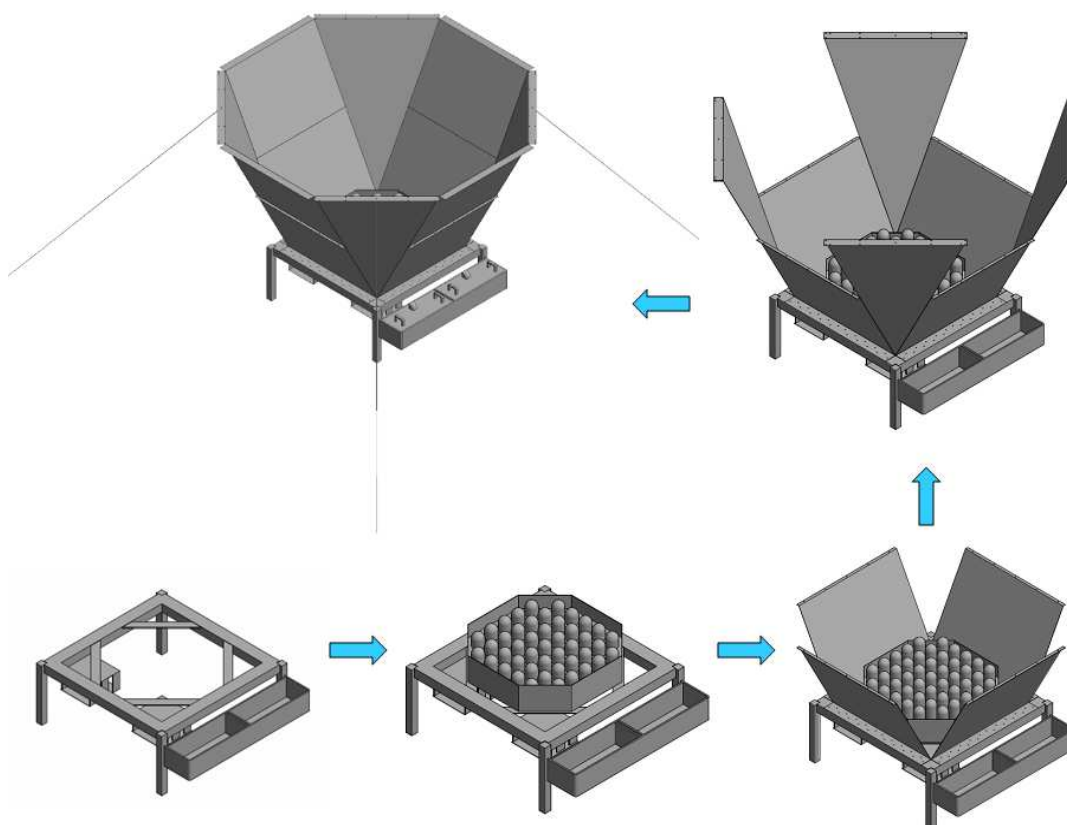
The enclosures are shipped as 4 triangular shaped and 8 (XFAS) or 4 (SFAS and MFAS) rectangular shaped metal panels that are coated by sound absorbing foam on the inside. It is recommended to assemble the enclosure with at least two people.

Attach first the large rectangular shaped enclosure panels to the support stand. The labels with 'Scintec' should be readable. After that, mount the four corner pieces in between these rectangular panels. Use the delivered screws and washers to connect all enclosure panels to each other. The long aluminium bars will be attached on top of the enclosure panels to gain more stability.

After assembling the enclosure, secure the four corners of the enclosure using the guy lines and that are shipped with the enclosure. Anchors that suit the surface type of the installation site should be used to fix the guy wires to the ground (see also Site Preparation Manual). The outcome should look as shown in Figure 18 or Figure 19.



**Figure 18: Assembly of the enclosure on top of the support stand (SFAS and MFAS)**



**Figure 19: Assembly of the enclosure on top of the support stand (XFAS)**



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## 2 OPERATION

### 2.1 Quick reference guide

Scintec Flat Array Sodars can be set up and prepared for operation quickly and easily. This section summarizes the steps required prior to performing a measurement:

1. Install the acoustic antenna. Connect the acoustic antenna with the Signal Processing Unit, connect the acoustic antenna with the power supply unit, and connect the terminal PC with the Signal Processing Unit.
2. Install the sodar Operation Software on your terminal PC (see Software Manual). You first have to create a Workspace (see Software Manual) specifying some basic parameters, such as your sodar device type, its serial number and the serial port of the terminal PC to which the Signal Processing Unit is connected to.
3. Before starting a measurement, you may perform a system self-test (see Software Manual).
4. Create the measurement settings using the submenu "Primary Settings >> Primary Settings Creator" (see Software Manual). For getting started, you may use default values, which are already displayed once the "Primary Settings Creator" window is opened. You may also define your configuration manually by changing the default values and pressing the "create" button.
5. Start the Device Server by choosing the option "Start Device Server" in the "Device" menu (see Software Manual).
6. Start the measurement by choosing the option "Start Measurement" in the "Device" menu (see Software Manual).
7. While measuring, select data view options in real time (see Software Manual).

## APPENDIX A SODAR/RASS OVERALL DIMENSIONS

### A.1 SFAS with RASS

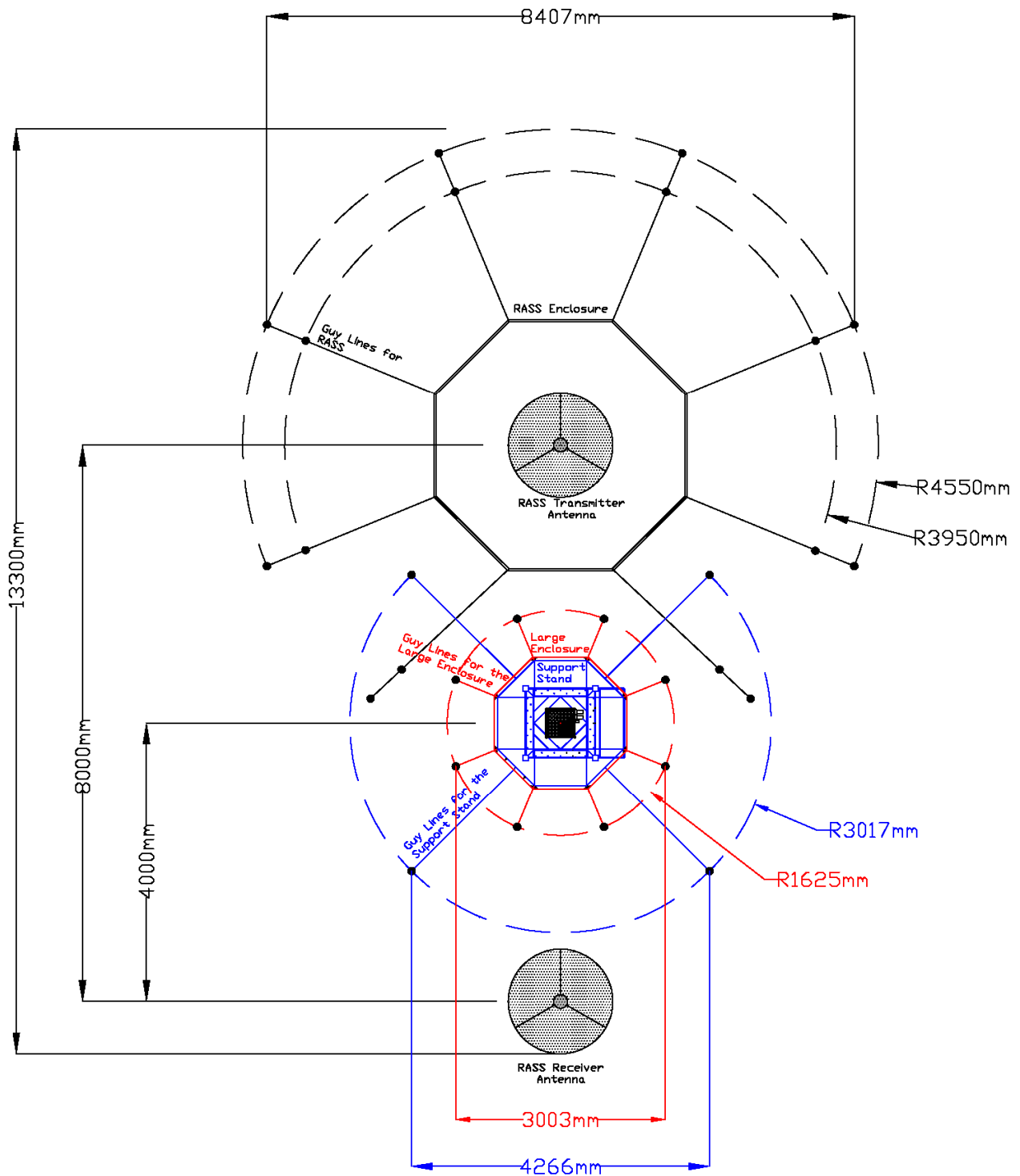


Figure 20: Overall dimension of SFAS/RASS system with large enclosure (red) or support stand (blue)

## A.2 SFAS with windRASS

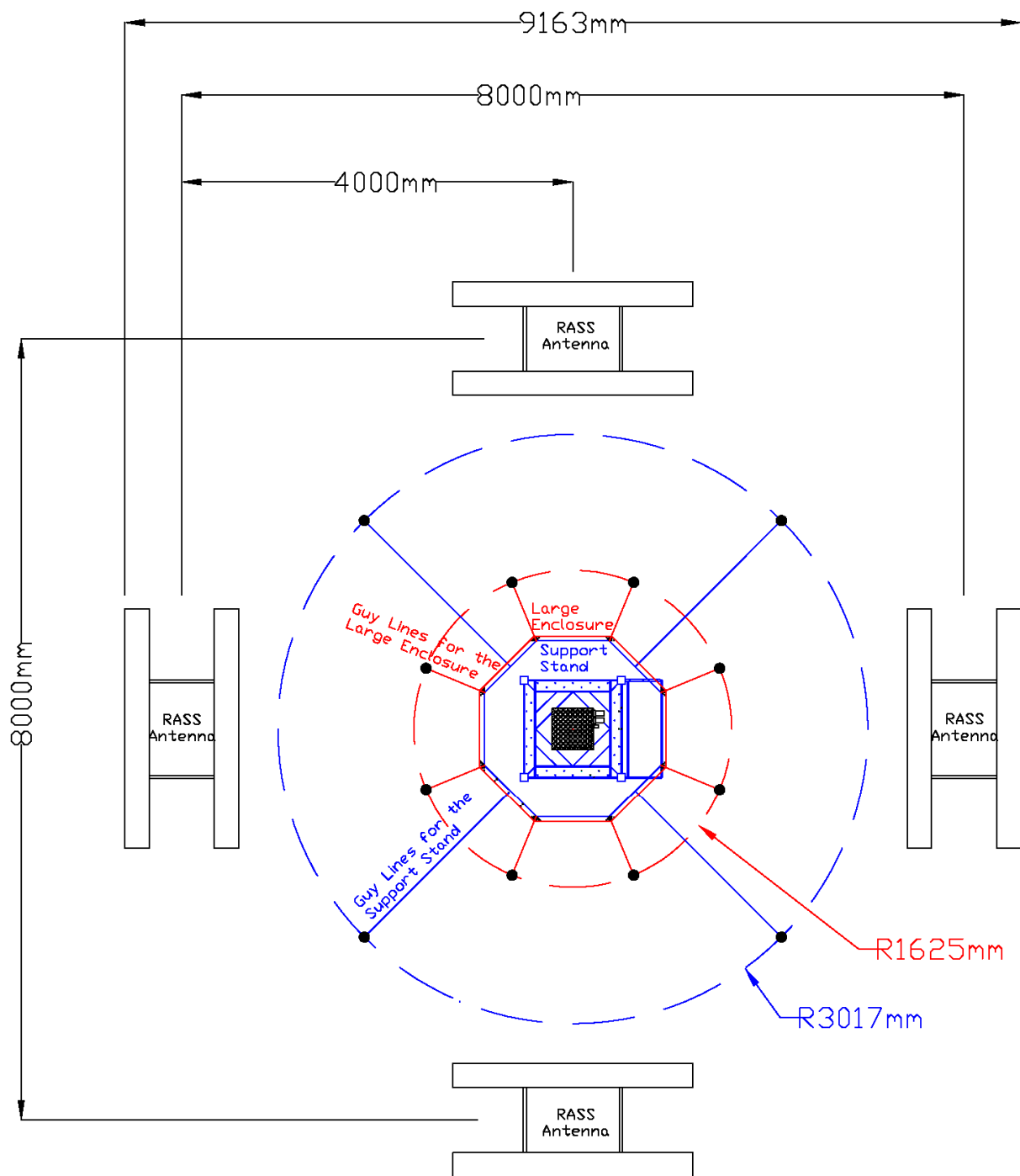


Figure 21: Overall dimension of SFAS/windRASS system with large enclosure (red) or support stand (blue)

### A.3 MFAS with RASS

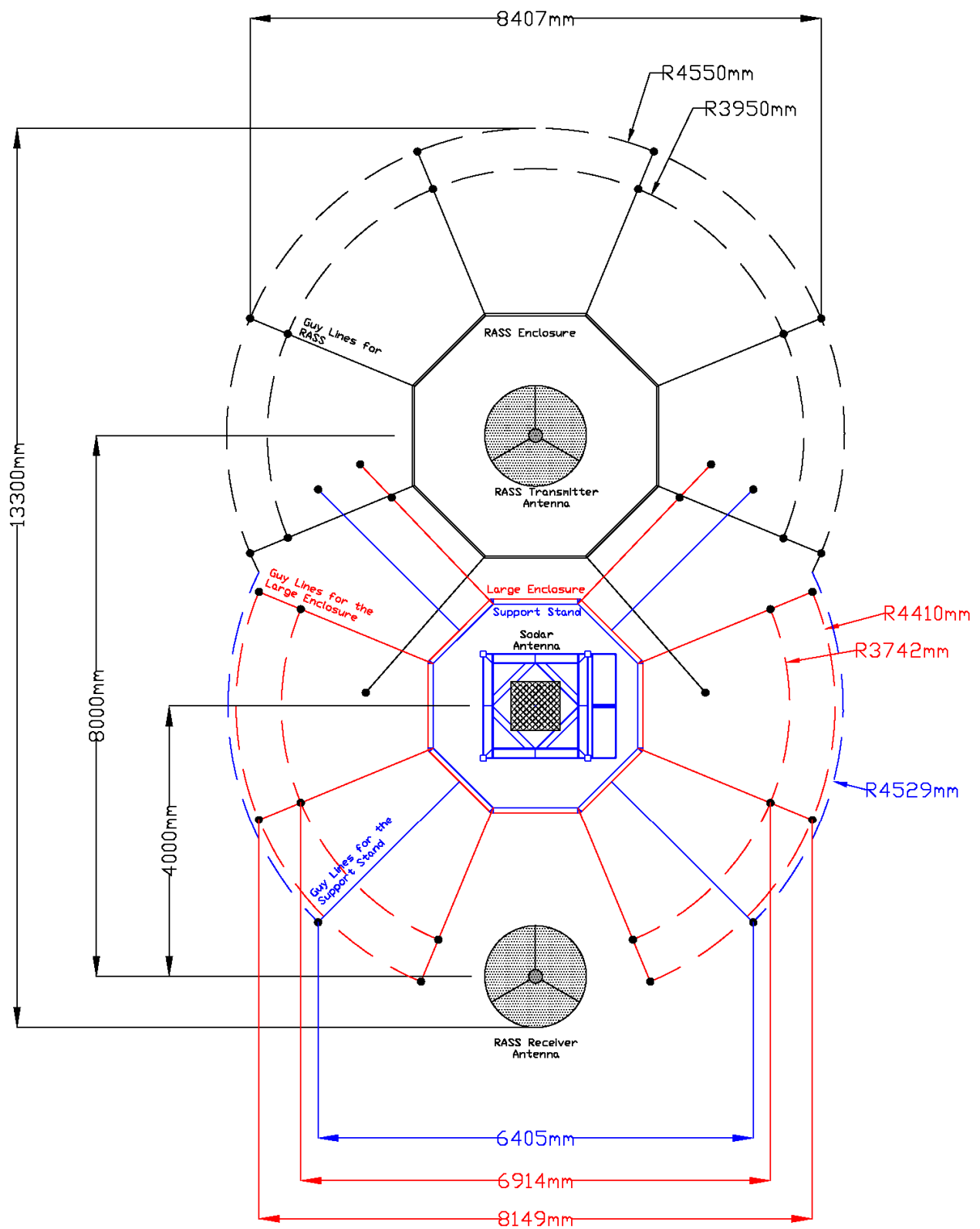


Figure 22: Overall dimension of MFAS/RASS system with large enclosure (red) or support stand (blue)

## A.4 MFAS with windRASS

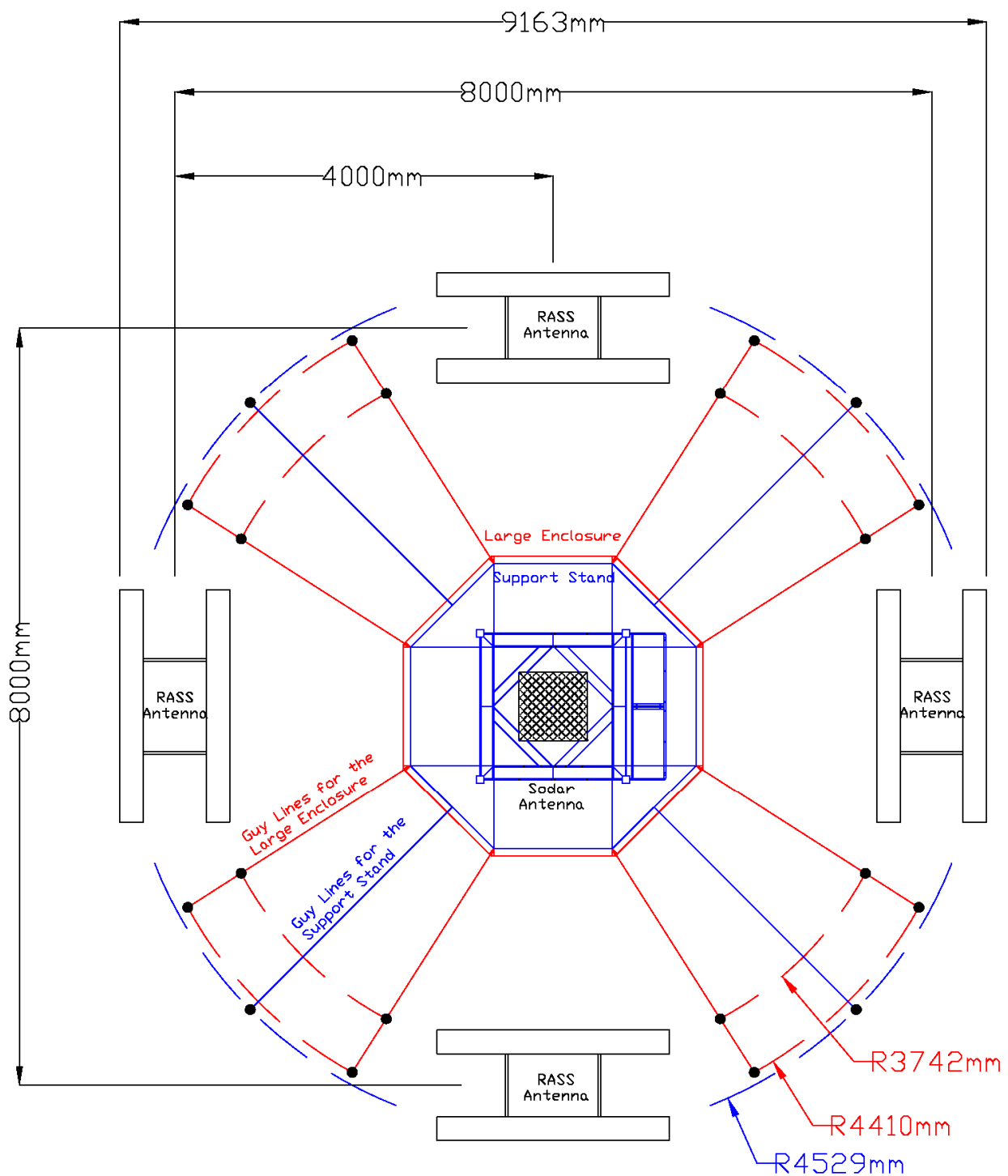


Figure 23: Overall dimension of MFAS/windRASS system with large enclosure (red) or support stand (blue)

## A.5 XFAS with RASS

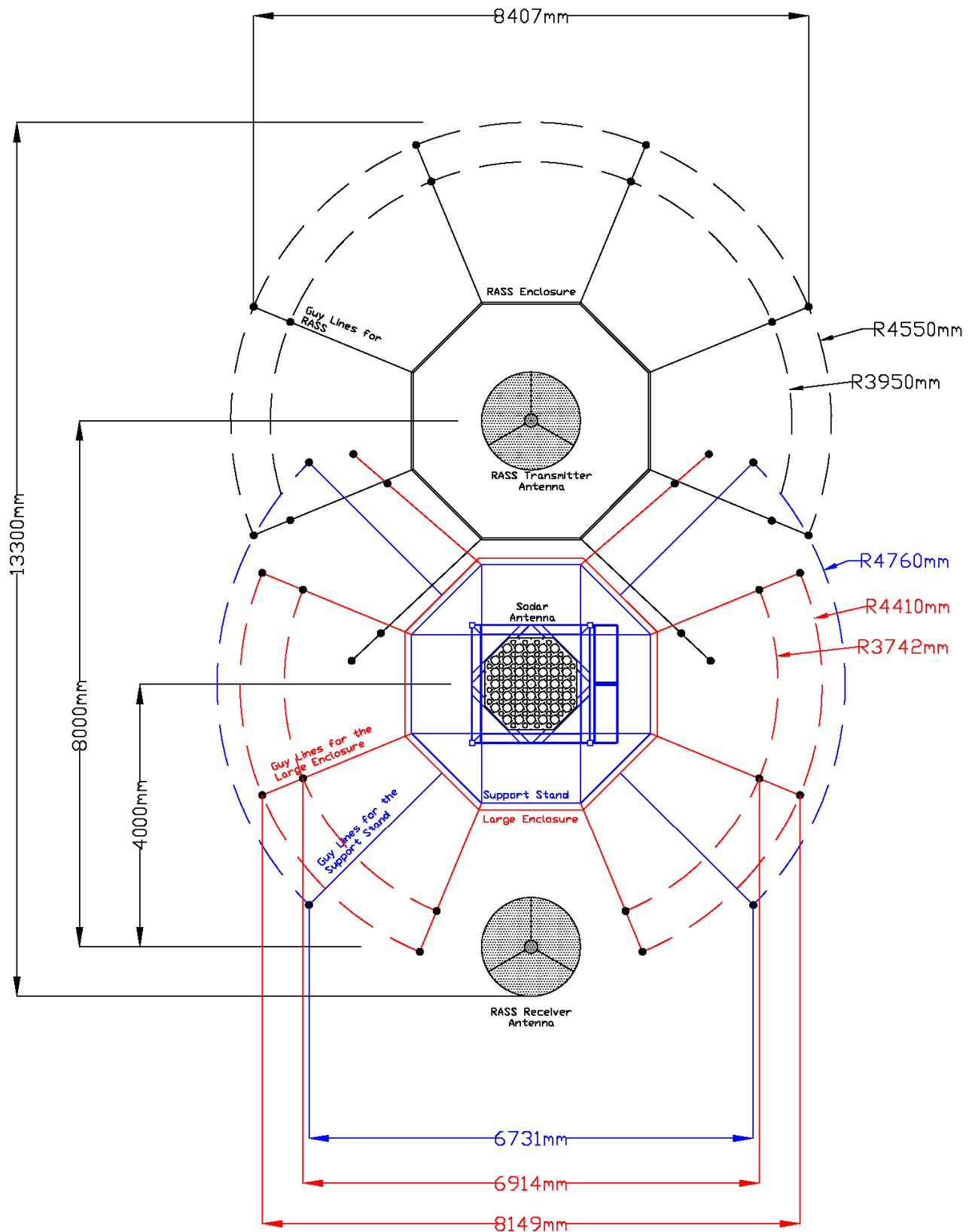


Figure 24: Overall dimension of XFAS/RASS system with large enclosure (red) or support stand (blue)