User Manual

RT-1000
Antenna Control

RHO
Elektronik GmbH
THETA

Note

The manufacturer reserves the right to make modifications at any time and without previous information of the here described product.

Content

1 Description

The antenna control unit supplies the special control signals required for cyclic electrical rotation of the four dipoles. Actually the four dipoles are switched in the right order in order to simulate one antenna which is running on circle orbit. Hence, the Doppler modulation is generated.

The RT-1000 Direction Finder system operates on the Doppler principle. To compensate the bearing deviation due to the group delays of the filter components, the antenna rotation is performed 32 times clockwise and 32 times counter clockwise. This is the so called left- and right-rotation. The rotation frequency is 3 kHz.

Further the antenna control provides reference signals, which are used by DF Channels in order to determine the correct bearing. One of these signals is a 6.144 MHz signal, which is used as reference to calculate bearing, which is exactly synchronous to the 3 kHz rotation. Another one is the R/L-Pulse (Right Left Pulse) which is used by DF Channels in order to detect the appropriate rotation direction.

Additionally, the antenna control module has a SUBD9 interface with antenna control signals, which can be used to drive the antenna model (see User Manual Antenna Model) and with this allow the bearing test of the system without the real antenna.

The R/L Off button on the front panel is made for testing issues. It stops the switching between clockwise and counter clockwise rotation. Thus, the oscillogram of the antenna control signals can easily be made and assessed without triggering on the R/L-Pulse.
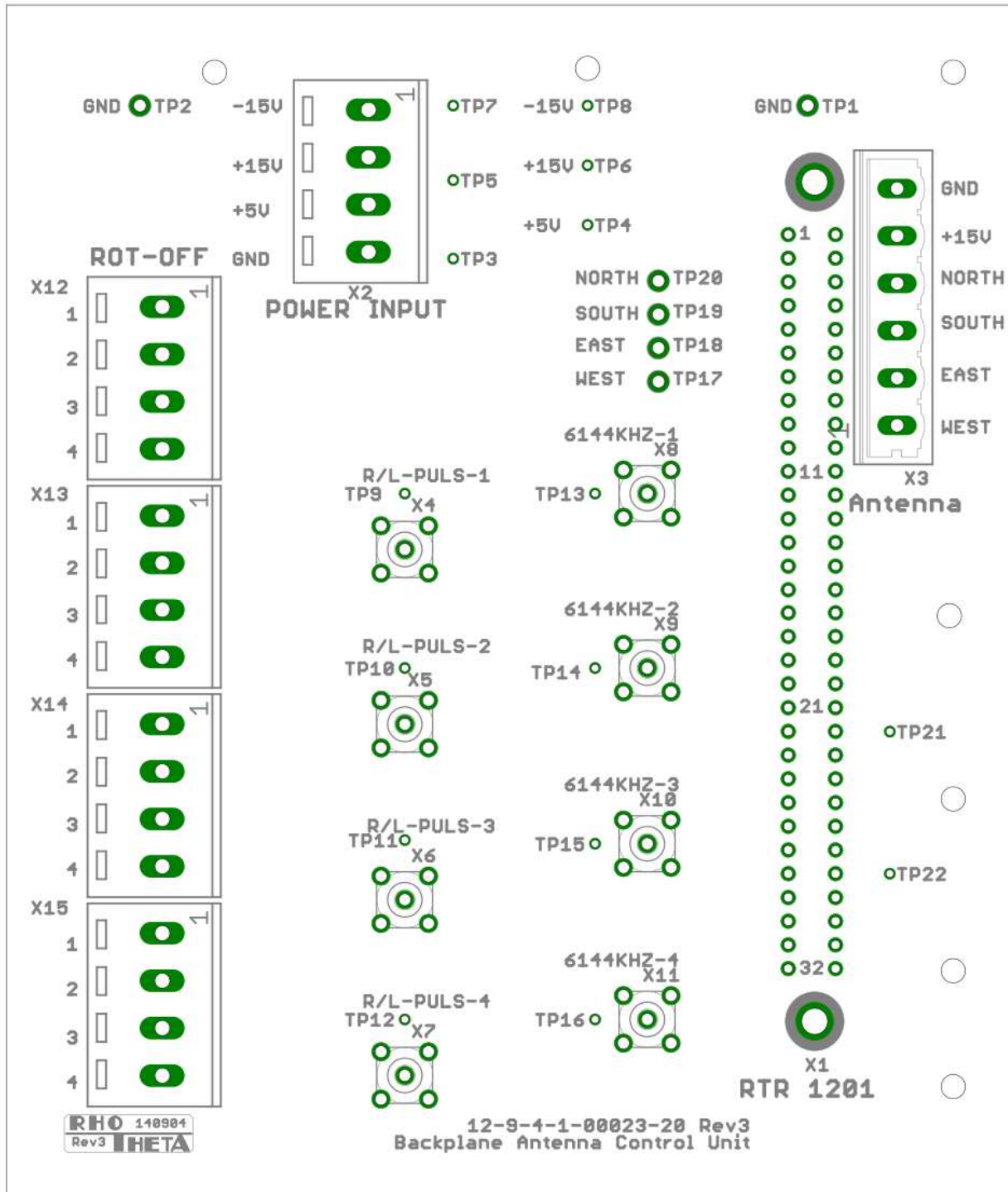
2 Front View

R/L OFF (S2): Switch OFF the change of clockwise and counter clockwise rotation.

Antenna Control (X2): Output of the antenna control signals. Connection to the antenna model

3 Rear View

4 R/L Off Button

The R/L Off button interrupts the right/left antenna rotation. If this button is pressed and the received signal is present, the value of 000° or 180°+ north adjustment (set in the system) appears on the QDM display of the controller.
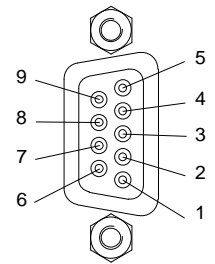
5 Interfaces

5.1 Antenna Control Jack

The antenna control D-Sub 9 jack (X2) is used to connect the RTM 1500 Antenna Model. The same signals are transmitted as at the antenna control connection (X3). Additionally, the R/L signal is available.

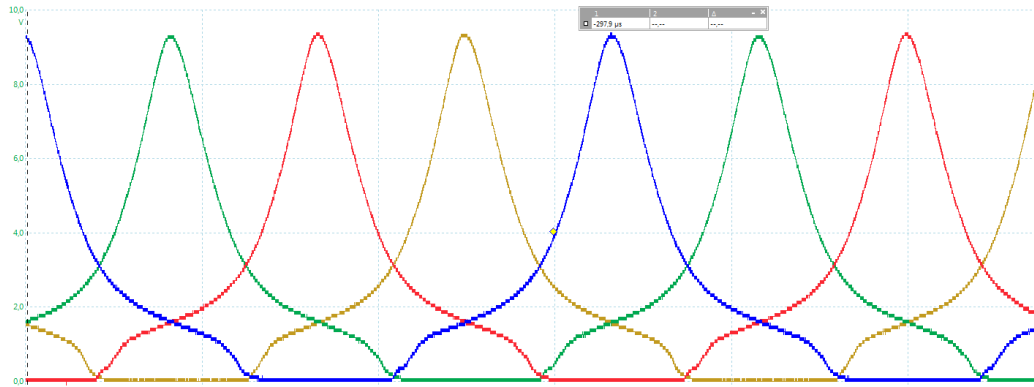| Backplane Interfaces X2			
Pin	**Signal**	**Function**	
1	OST	Antenna Control Signal, East	
2	WEST	Antenna Control Signal, West	
3	GND	Ground	
4	GND	Groung	
5	+15 V	DC Supply +15 V	
6	SUED	Antenna Control Signal, South	
7	NORD	Antenna Control Signal, North	
8	R/L	Right/Left rotation change-over signal	
9	+15V	DC Supply +15 V	

5.2 Backplane Interfaces

Backplane Interfaces			
Connector	**Pin**	**Signal**	**Function**
X1	--	--	Internal connection
X2	1	-15 V	DC Supply Input -15 V_{DC}
	2	+15 V	DC Supply Input +15 V_{DC}
	3	+5 V	DC Supply Input +5 V_{DC}
	4	GND	DC Supply Input Ground
X3	1	WEST	Antenna Control Signal, West
	2	EAST	Antenna Control Signal, East
	3	SOUTH	Antenna Control Signal, South
	4	NORTH	Antenna Control Signal, North
	5	+15 V	Antenna Control Signal, +15 V_{DC}
	6	GND	Antenna Control Signal, Ground
X4	--	R/L-PULS-1	Reference Signal R/L Pulse
X5	--	R/L-PULS-2	Reference Signal R/L Pulse
X6	--	R/L-PULS-3	Reference Signal R/L Pulse
X7	--	R/L-PULS-4	Reference Signal R/L Pulse
X8	--	6144KHZ-1	Reference Signal 6,144 MHz
X9	--	6144KHZ-2	Reference Signal 6,144 MHz
X10	--	6144KHZ-3	Reference Signal 6,144 MHz
X11	--	6144KHZ-4	Reference Signal 6,144 MHz
X12	1	ROT-OFF-1	ON/OFF Antenna Control Signals, Channel 1
	2	GND	ON/OFF Antenna Control Signals, Channel 1 Ground
	3	ROT-OFF-2	ON/OFF Antenna Control Signals, Channel 2
	4	GND	ON/OFF Antenna Control Signals, Channel 2 Ground
X13	1	ROT-OFF-3	ON/OFF Antenna Control Signals, Channel 3
	2	GND	ON/OFF Antenna Control Signals, Channel 3 Ground
	3	ROT-OFF-4	ON/OFF Antenna Control Signals, Channel 4
	4	GND	ON/OFF Antenna Control Signals, Channel 4 Ground
X14	1	ROT-OFF-5	ON/OFF Antenna Control Signals, Channel 5
	2	GND	ON/OFF Antenna Control Signals, Channel 5 Ground
	3	ROT-OFF-6	ON/OFF Antenna Control Signals, Channel 6
	4	GND	ON/OFF Antenna Control Signals, Channel 6 Ground
X15	1	ROT-OFF-7	ON/OFF Antenna Control Signals, Channel 7
	2	GND	ON/OFF Antenna Control Signals, Channel 7 Ground
	3	ROT-OFF-8	ON/OFF Antenna Control Signals, Channel 8
	4	GND	ON/OFF Antenna Control Signals, Channel 8 Ground

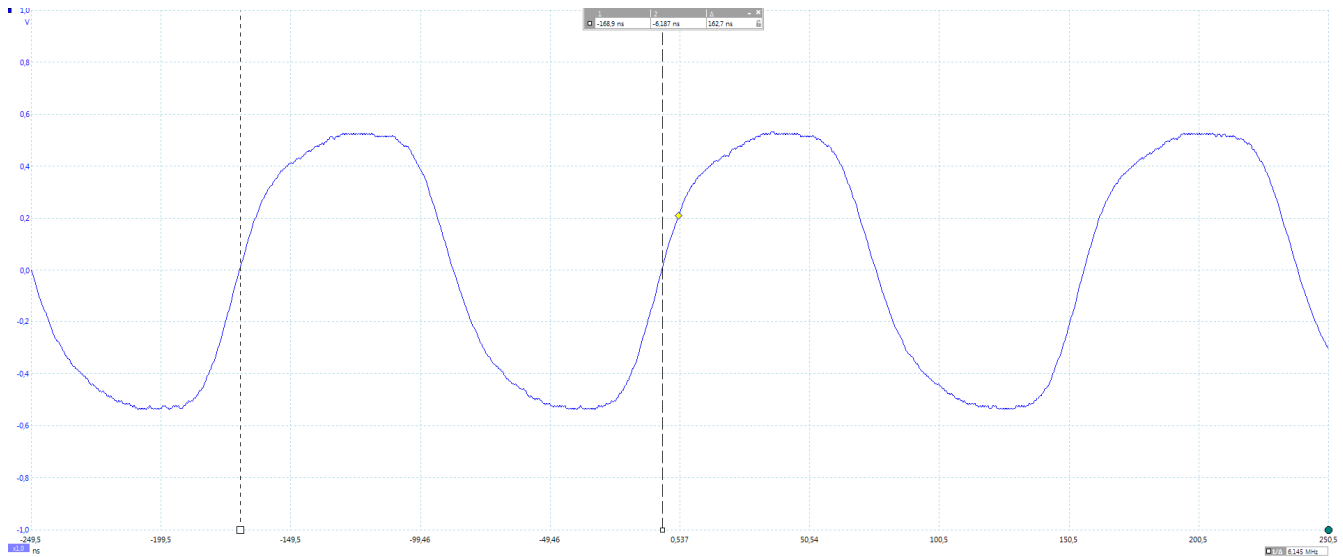## 5.3 Signal Sequences

5.3.1 Antenna Control Signal

Set the trigger top channel 1
Channel 1 – **West**   Channel 2 - **East**   Channel 3 – **South**   Channel 4 - **North**

Limits:

U_{high} ≥ + 8,5 V

5.3.2 6,144 MHz Reference Signal
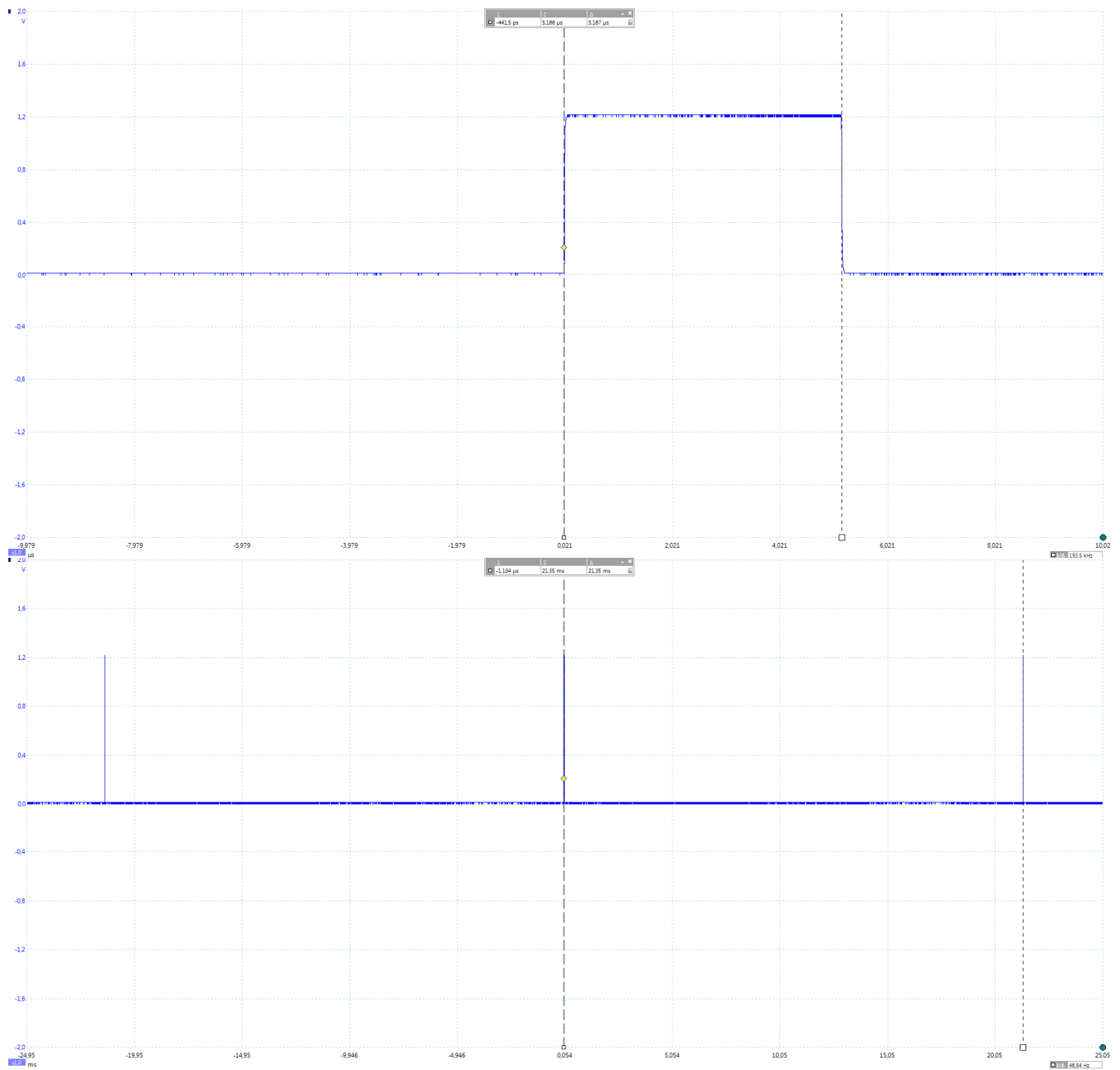

Limits:

U_{high} ≥ + 0,5 V
U_{low} ≤ - 0,5 V
f   = 6,144 MHz ± 3 kHz

5.3.3 R/L Pulse

Limits:

t_{high} = 5,1 µs ± 0,2 µs
t_{low} = 21,3 ms ±0,5 ms
U_{high} ≥ + 1,0 V
U_{low} ≤ + 0,2 V

6 Notes