6 Safety loops / Enabling ACU

The SCANTER 5502/5602 transceivers have built-in safety precautions to prevent the antenna from rotating and the transceivers from transmitting when personnel need to work close to the antenna. This loop is interrupted by a Man Aloft switch, which is activated when the work on the antenna starts; it isolates power from the turning unit and prohibits transmission as long as the switch is activated.

In order to protect the immediate surroundings from extended exposure to electromagnetic radiation, the safety system will prevent transmitting whenever the antenna is not rotating. This is achieved by not powering up the SSPA unless antenna encoder signals are indicating that the antenna is rotating.

Inside SCANTER antenna turning units the motor is protected by means of a bimetallic switch integrated in the motor for efficient shut down if the motor is overheated. The bimetallic switch opens at 150 ºC, shutting down the turning unit and transmission. At 120 ºC, a warning is reported by the BITE system.

Furthermore, an ACU fault will also stop antenna rotation and transmission.

6.1 Single System

6.1.1 Safety loop

For human safety, a hard-wired safety current loop prevents antenna rotation and RF transmission, if the safety loop is broken or opened. A number of serial connected switches comprise the entire safety loop.

Further, the antenna drive motor is equipped with temperature sensors, which initially give a warning when the temperature is excessive and eventually switch off both transmission and motor.

The transmission can be controlled externally via the available external hardware EMCON/Tx Inhibit logical interface, which will instantaneously force the transmitter to react accordingly.

Transceiver transmission can be started by issuing a “transmit start” command, either by clicking the Tx button in the Radar Service Tool program or by activating transmission from another client program. The radar will remember the transmission status when power is switched off, so the system will always return to the same transmission status it had previously. Transmission will only start if all of the below prerequisites are fulfilled:

	Antenna rotation (RPM) is greater than 0.
	ACU status is normal.
	Motor protection and Man Aloft Switch are not activated.

The antenna start and transmit permissions are controlled by the transceiver.

Fig. 6.1 (p. 100) shows the safety loop of a single system. The safety loop is supplied with +24 VDC; the Man Aloft switch(es) and motor protection are supplied

from the transceiver and the “ACU Fault” is supplied from the motor controller (through the ACU mains switch).

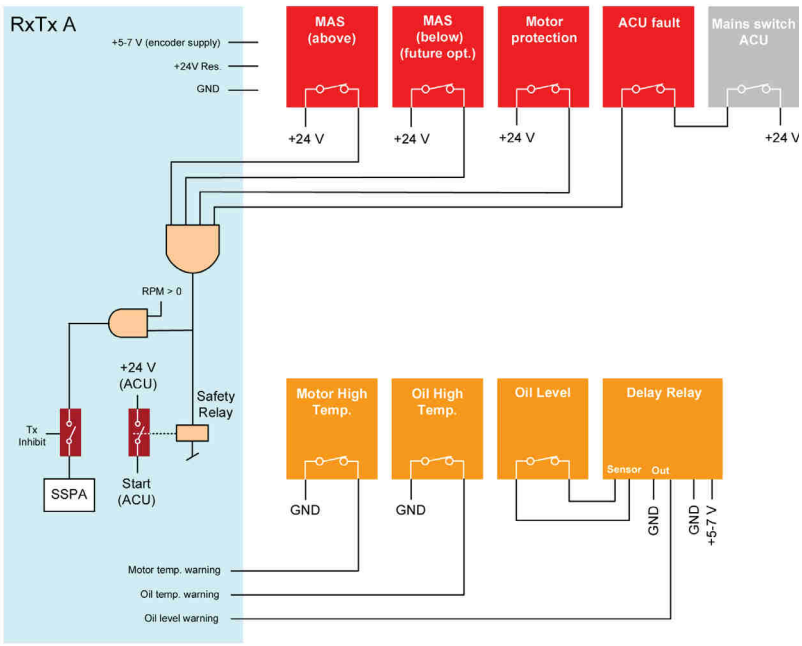


Fig. 6.1 Safety Loop and warnings, single system

The four inputs from the loop (Man Aloft Switch (above), Man Aloft Switch (below), motor protection, and ACU Fault) are AND’ed together. Provided that they all are true (i.e.no errors), the output of the AND-function is true as well and with that the safety relay is energized.

When +24 V is applied to “Start” on the ACU, the start function is enabled and with that it is possible to start the antenna rotation with a command via the serial communication.

To activate transmission from the SSPA the 4 above mentioned inputs are AND’ed with the signal “RPM > 0” which ensures that transmission is only possible when the antenna rotates.When the SSPA is enabled with antenna rotation and no errors in the safety loop, the transmission can be controlled externally using the “Tx Inhibit/EMCOM” function.

6.1.2 Warnings from antenna system

Fig. 6.1 (p. 100) also shows input signals from the antenna unit which give a warning without any impact on the safety loop. The signals are as follows:

	Motor High Temperature - motor temperature has reached 120 degrees Celsius.
	Oil High Temperature (if available).
	Oil Level (optional) - a delay is introduced to this signal to avoid short-termed variations on the oil level.

6.1.3 Enabling ACU

The safety relay, together with the “Radar Mains ON” relay, ensures that the start function of the antenna is enabled in all possible situations. The wiring is shown in Fig. 6.2 (p. 101) where the red wires show how the start input of the motor controller is supplied with +24 VDC. In a single system, two of the terminals are connected as shown close to the start input.

The relays are shown in the position where mains is on and the safety loop is not interrupted. Whenever the safety loop is interrupted by a failure or activation of the man aloft switch, the contacts of K1 change position and thereby remove the +24 VDC to the start input of the motor controller. The same happens when the mains switch turns off the transceiver and the contacts of K2 change position.

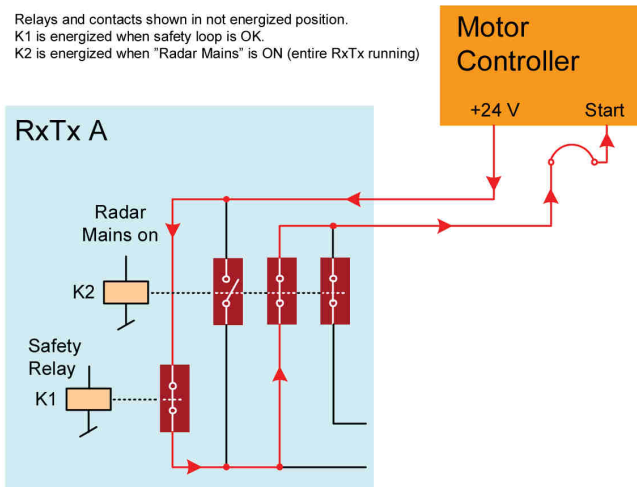


Fig. 6.2 Start enabled - single system

6.2 Redundant system

6.2.1 Safety loop

Fig. 6.3 (p. 102) shows the safety loop of a redundant system consisting of a transceiver A (RxTx A) and a transceiver B (RxTx B). The four inputs from the loop (Man Aloft Switch (above), Man Aloft Switch (below), motor protection, and ACU Fault are AND’ed together in both transceivers, i.e. the two transceivers are holding the same circuits for the safety loop. Provided that they all are true (i.e.no errors), the output of the AND-function is true as well and thereby the safety relay is energized.

When +24 V is applied to “Start” on the ACU, the start function is enabled and with that it is possible to start the antenna rotation with a command via the serial communication.

To activate transmission from the SSPA, the 4 above-mentioned inputs are AND’ed with the signal “RPM > 0” which ensures that transmission is only possible when the antenna rotates. When the SSPA is enabled with antenna rotation and no errors in the safety loop, the transmission can be controlled externally with the “Tx Inhibit/ EMCOM” function.

6.2.2 Warnings from antenna system

Fig. 6.3 (p. 102) also shows input signals from the antenna unit which give a warning without any impact on the safety loop - these are

- Motor High Temperature - motor temperature has reached 120 degr.
- Oil High Temperature (if available)
- Oil Level (optional) - a delay is introduced to this signal to avoid short-termed variations on the oil level.

All signals are applied in both transceiver A and transceiver B.

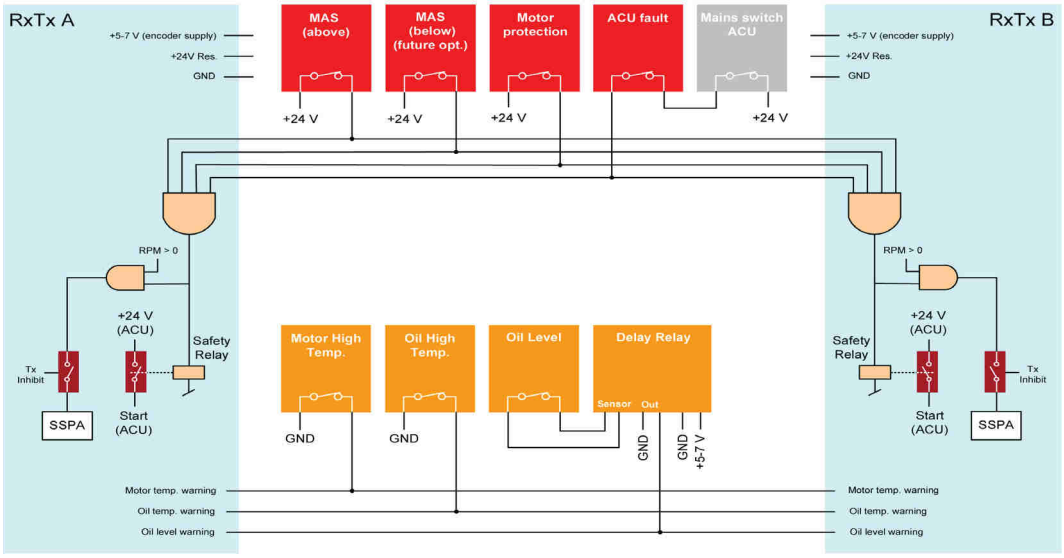


Fig. 6.3 Safety Loop, redundant system

6.2.3 Enabling ACU

The safety relay together with the “Radar Mains ON” relay ensures that the start function of the antenna is enabled in all possible situations, i.e. also when one of the transceivers is switched off. The interconnections between the two transceivers are shown in Fig. 6.4 (p. 103) and therefore enabling the motor controller start depends on two safety relays and two mains switches, one set of functions in each transceiver.

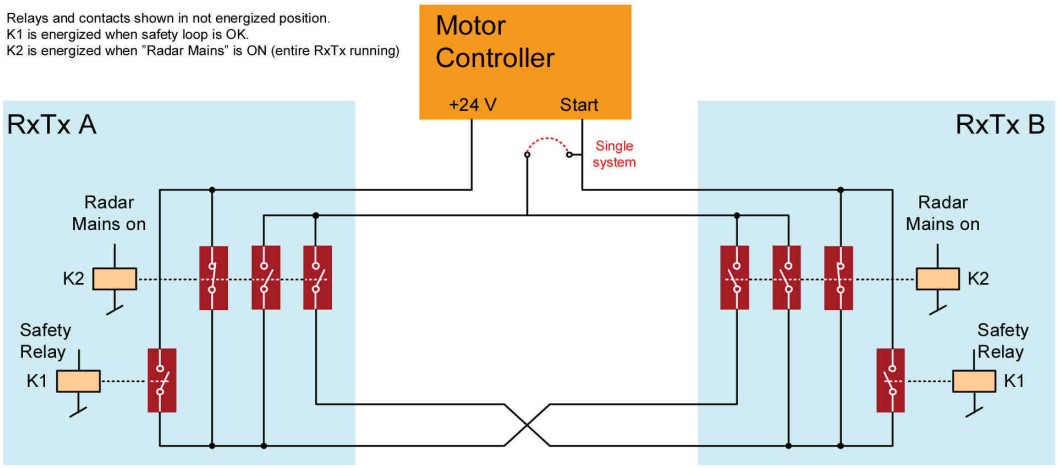


Fig. 6.4 Interconnections - redundant system

6.2.3.1 RxTx A on / RxTx B off

Fig. 6.5 (p. 103) shows the situation, where transceiver A (RxTx A) is on and transceiver B (RxTx B) is off.

The red wires show how the start input of the motor controller is applied +24 VDC.

The relays in RxTx A are shown in the position where mains is on and safety loop not interrupted and in RxTx B both relays are de-energized. The +24 VDC is applied the start input of the motor controller through the contacts of the energized relays in RxTx A and thereafter, through the contacts of the de-energized relays in RxTx B.

Whenever the safety loop is interrupted by a failure or activation of the man aloft switch, the contacts of K1 in RxTx A change position and with that remove the +24 VDC to the start input of the motor controller. The same happens when the mains switch of RxTx A is turning off the transceiver and the contacts of K2 change position.

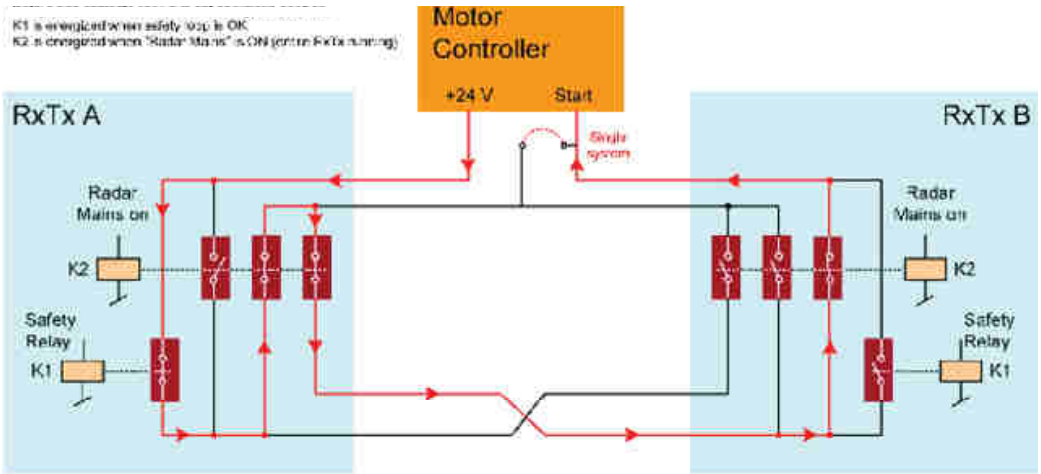


Fig. 6.5 Start enabled - RxTx A on, RxTx B off

6.2.3.2 RxTx A off / RxTx B on

Fig. 6.6 (p. 104) shows the situation where transceiver A (RxTx A) is off and transceiver B (RxTx B) is on.

The red wires show how the start input of the motor controller is applied +24 VDC.

The relays in RxTx B are shown in the position where mains is on and the safety loop is not interrupted and in RxTx A both relays are de-energized. The +24 VDC is applied the start input of the motor controller through the contacts of the energized relays in RxTx B and thereafter, through the contacts of the de-energized relays in RxTx A.

Whenever the safety loop is interrupted by a failure or activation of the man aloft switch, the contacts of K1 in RxTx B change position and with that remove the +24 VDC to the start input of the motor controller. The same happens when the mains switch of RxTx B is turning off the transceiver and the contacts of K2 change position.

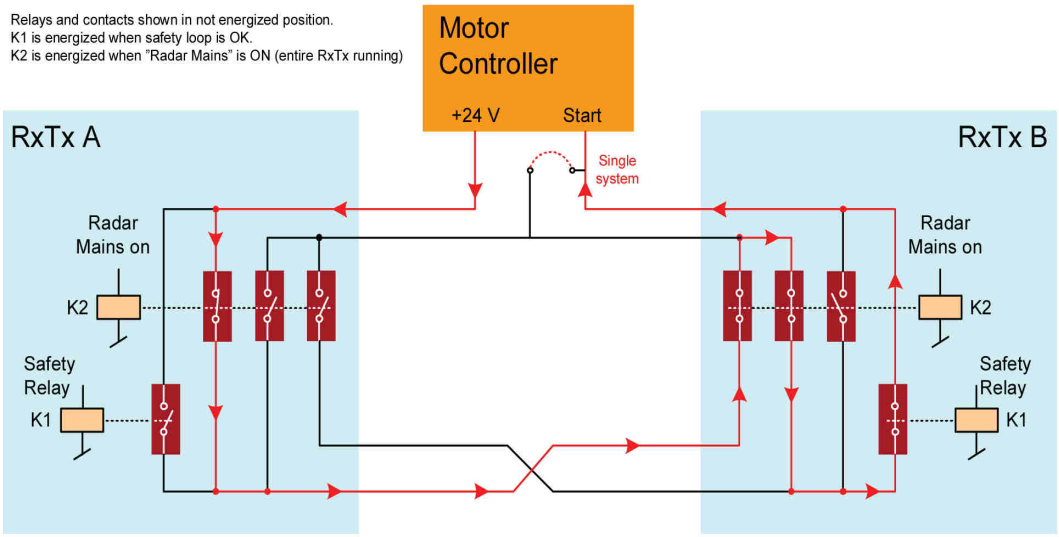


Fig. 6.6 Start enabled - RxTx A off, RxTx B on

6.2.3.3 RxTx A on / RxTx B on

Fig. 6.7 (p. 105) shows the situation where both transceiver A (RxTx A) and transceiver B (RxTx B) are on.

The red wires show how the start input of the motor controller is applied +24 VDC.

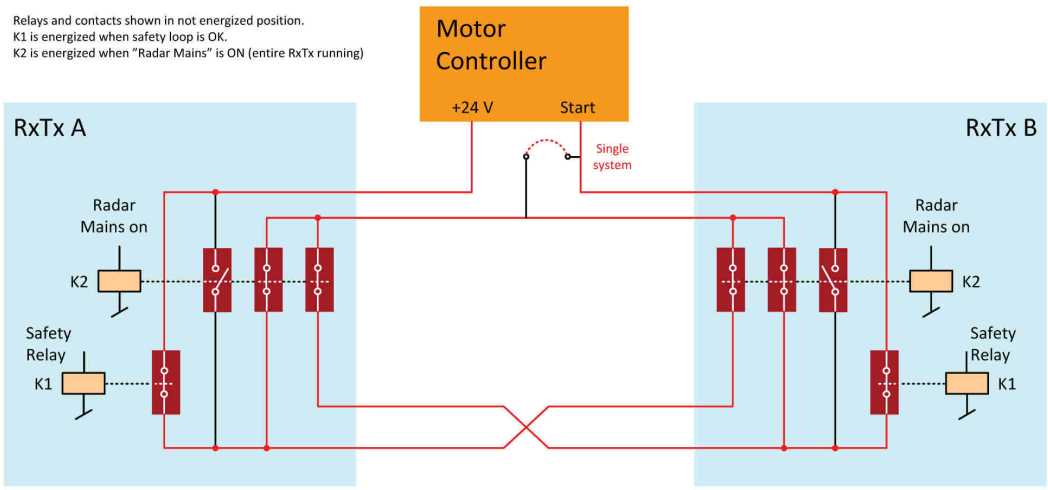


Fig. 6.7 Start enabled - RxTx A on, RxTx B on

7 Maintenance

7.1 Preventive maintenance

7.1.1 General preventive maintenance

Keep equipment dry and free from dirt.

Keep connection points for lightning protection free from paint/corrosion. Keep them well greased (Poly Buly Copysil, grade 492).

Keep protective ground wires in good condition, and check the connection if any of them has been removed.

Clean all surfaces with a soft cloth. Remove dirt using small amounts of water with a mild soap. Do never use trichlorethylene or alcoholic agents.

7.1.2 Scheduled preventive maintenance

		6 months	12 months	7 years	8 years
Entire installation	Perform visual inspection of the entire installation - repair observed damages	X			
ACU	Clean/replace air filter	X			
Waveguide	Check for leakage, deformations, corrosion etc. including grounding points		X		
	Check dehydrator/desiccator (pressure, hour counter or change in color)	X			
Transceiver	Clean/replace air filters	X			
	Replace Blower Assy				X
	Replace battery on PC Controller Board			X	

The above intervals assume that the equipment is mounted in rough conditions. On the basis of experience, the intervals may be extended on individual sites if conditions are mild. In dust filled environments, air filters may require more frequent cleaning/replacement.

7.2 Corrective maintenance

When performing corrective maintenance on the External I/O module, motherboard (part of the Crate Assy) or Interconnection Board in a ***redundant*** system, the system may experience downtime if the safety loop is interrupted (this depends on the ACU variant used). Please observe the information in the sections below.

7.2.1 ACU with type selector switch

New ACU variants have a type selector switch (see Fig. 7.17 (p. 121)).
The position on the switch must simply be changed before initiating the maintenance procedure for any of the above LRUs. See instructions in the respective maintenance tasks in section 7.4 (p. 118).

7.2.2 ACU without type selector switch

If the ACU variant does not have a type selector switch, a jumper must be inserted into a D-sub cable (W8) from the transceiver to be serviced (i.e. the passive transceiver). Follow the procedure below before proceeding with the replacement task for the LRU in question.

Be aware that system downtime (no radar video available) will occur twice. Each time, the lack of video availability will be less than one minute.

The reason for the system downtime is enabling/disabling the ACU. The ACU is part of the safety loop and needs a 24 Volt start signal. This is achieved by using a safety relay together with a “Radar Mains ON” relay. For more information on the safety relays, see section 6.2.3 (p. 102).

The relay systems are mounted on the Ext. I/O module. When dismounting the Ext. I/O module or the communication cable (W8) from the I/O module to the ACU, the safety loop is interrupted, causing a system stop.

The redundant system must be configured as a single system while carrying out the module replacement on the passive transceiver, and re-configured as a redundant system after the module replacement. This configuration is performed using a 25-pin D-SUB male connector.

A Prepare a 25-pin D-SUB male connector (see Fig. 7.1 (p. 108).

Connect a wire from pin no. 5 to pin no. 17.

Fig. 7.1 25-pin D-SUB male connector with one wire

B Alternatively, follow the jumper wiring instructions found inside the ACU cabinet (see example in Fig. 7.2 (p. 109)). These are also available in doc. no. 659002-ND.

For an overview of the system wiring, see Fig. 7.3 (p. 110).

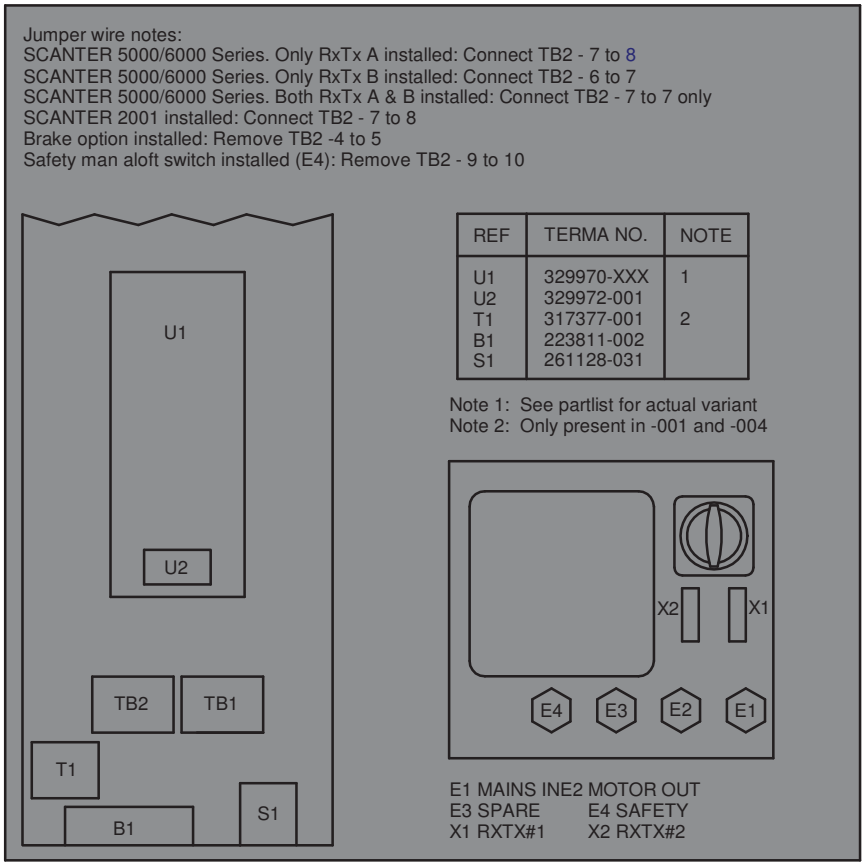


Fig. 7.2 ACU jumper wiring instructions

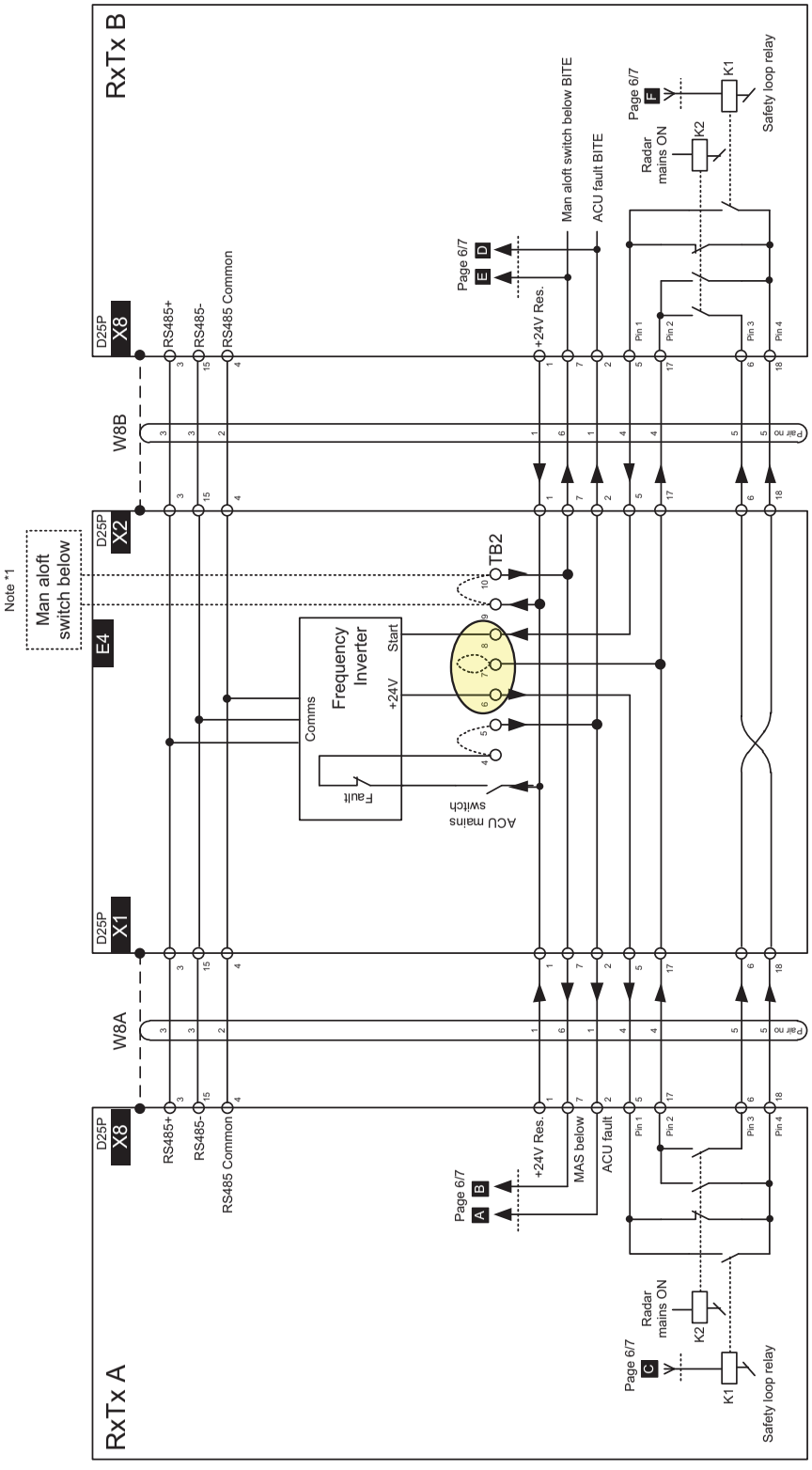
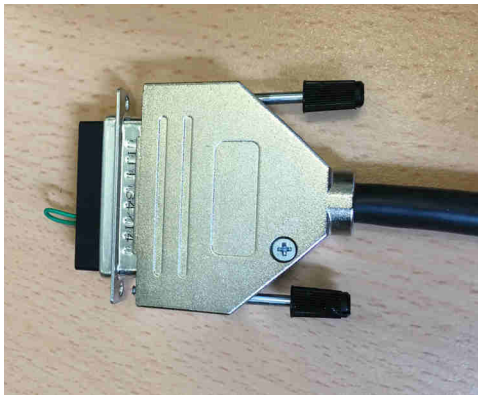
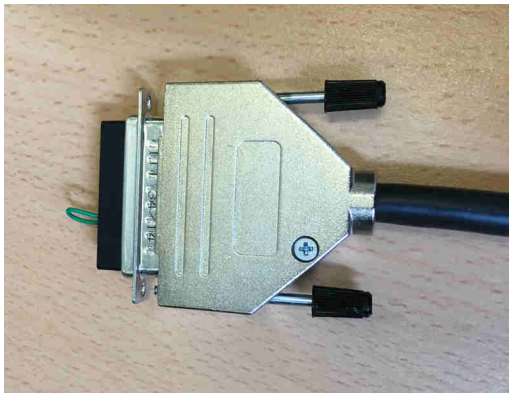


Fig. 7.3 Wiring diagram, redundant system

1	In the RST controlling the redundant transceiver (i.e. the one which should *not* be serviced), activate the transceiver by selecting “Force” in the “Redundant System Failover” parameter.
2	In the RST controlling the transceiver to be serviced, set “Mains” to “Off” in the “Radar Control” view. The transceiver now becomes passive (standby).
3	Turn off the mains switch on the passive transceiver.
4	For a **redundant** transceiver configuration, the first down time happens when removing the D-SUB cable (W8) from the connector X8 at the bottom of the Ext. I/O: On the passive transceiver, remove the W8 cable and immediately connect it to the prepared 25-pin D-SUB male connector with one wire. This will also end the down time (less than one minute). See Fig. 7.4 (p. 111) The radar system is now configured as a single transceiver system.  Fig. 7.4 W8 cable connected to 25-pin D-SUB male connector
5	Perform the relevant maintenance task on the transceiver that has been shut down for service.

6	When the maintenance procedure is completed: For a **redundant** transceiver configuration, the second down time happens when disconnecting the prepared 25-pin D-SUB male connector with one wire from the W8 cable.  Fig. 7.5 W8 connected to 25-pin D-SUB male connector Disconnect the W8 cable from the prepared 25 pin D-SUB Male connector with one wire. Immediately connect the W8 cable to the X8 connector on the Ext. I/O module at the bottom of the cabinet. This will end the down time (less than one minute). The radar system is now configured as a redundant transceiver system. Turn on the mains switch on the passive transceiver and use the RST to set “Mains”, “Antenna” and “Tx” to “On”.

7.3 Consumables, spare parts and tools

7.3.1 Consumables

Consumables	Part number
Terma on-site consumables (air filters and fuses), see Fig. 7.6 (p. 113)	696294-001
Air filter, transceiver	524884-001
Air filter, ACU	262394-001
Cable strap, Ø44 x 4 mm, black	201197-010
Cable strap, Ø20 x 2.5, natural	201197-049

7.3.1.1 Terma on-site consumables

Fig. 7.6 Terma on-site consumables

7.3.2 Spare Parts

Module	Part number
Waveguide Assembly	386240-00x
SSPA, short range	386255-002
SSPA, long range	386250-002
RxTx	386232-00x
RxTx Controller	386222-00x
Crate Assy incl. Motherboard	386265-00x
PC Controller Board	386285-00x
Battery, lithium, for PC Controller Board	519886-001
Common Platform 4 (CP4) Board	386260-00x
External I/O Board	386270-00x
Power Supply Unit	386290-00x
Blower Assy	386298-00x
Waveguide, SSPA	524894-00x
Interconnection Board	386275-00x
Fuse, mains, 15 A, Fast, Cartridge	307609-018
Fuse, mains, 6.3 x 32 Slow, 16 A	610376-019

7.3.3 Tools

Tools	Part number
Standard tools	N. A.

Tools	Part number
Terma Tool Kit	696293-001
Vacuum cleaner	N. A.
Brush	N. A.

7.3.3.1 Standard Tools

A collection of standard tools which is expected to be in a technician's tool box such as screwdrivers (for Philips, Pozi drive, and slotted screws), side cutters, spanners, Allen keys, tweezers etc.

7.3.3.2 Terma Tool Kit

The Terma Tool Kit includes tools necessary to perform maintenance on the SCANTER 5502/5602.

Below a description of the tools and where they are used.

Fig. 7.7 Terma Tool Kit

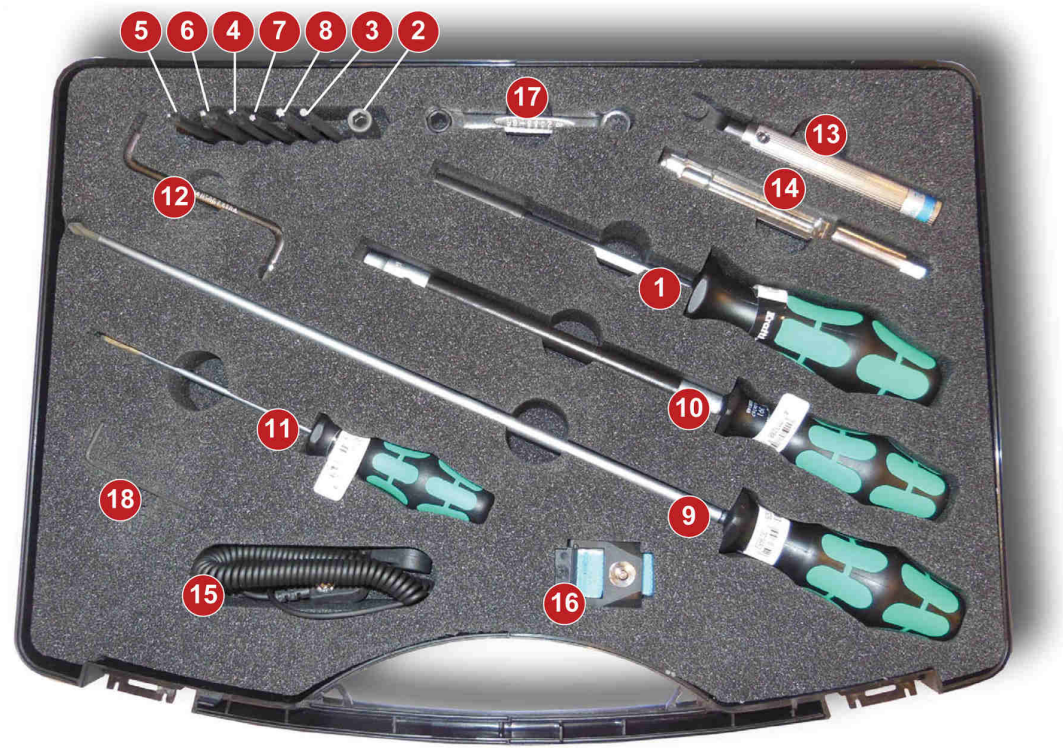


Fig. 7.8 Contents, Terma Tool Kit

		Use:
1	Bit screwdriver	Handle for bits
2	Bit, socket SW 5.5 mm	Interconnection PCB
3	Bit, UNB, 3 x 89 mm	Cable support (Frame Assy)
4	Bit, PH2 x 89 mm	Filter, CP4, PC Board
5	Bit, PZ1 x 89 mm	Cover plate
6	Bit, PZ2 x 89 mm	Blower
7	Bit, Torx T10 x 89 mm	Interconnection PCB
8	Bit, Torx T20 x 89 mm	External I/O, Frame Assy
9	Screwdriver PH2 x 300 mm	PSU, RxTx, RxTx Control
10	Screwdriver, flexible, 6 x 167 mm	WG Assy SSPA
11	Screwdriver, 3.5 x 100 mm	D-Sub Connectors
12	Screwdriver, angled, 3.5 x 90 mm	D-Sub Connectors
13	Torque wrench, 1 Nm	SMA Connectors
14	Extender for torque wrench	SMA Connectors
15	ESD Cable	ESD protection
16	ESD Bracelet	ESD protection
17	Ratchet for bits	Blower (crate) if present
18	Allen key, 2 mm	Blower

7.3.4 Cable Marking

In general, when a module is removed from the transceiver it is always a good idea to note the positions where the cables are connected - specially if there is no marking on the cables.

All cables within the transceiver are marked. This means that it should be possible to find the position for each connector.

The way of marking the cables in the transceiver is shown below.

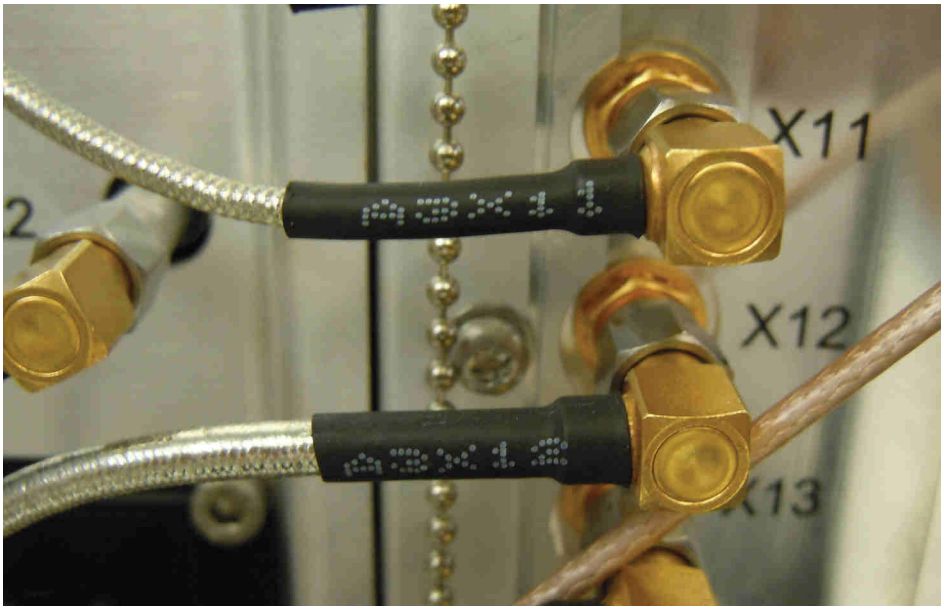


Fig. 7.9 Marking SMA (A3X11 and A3X12)

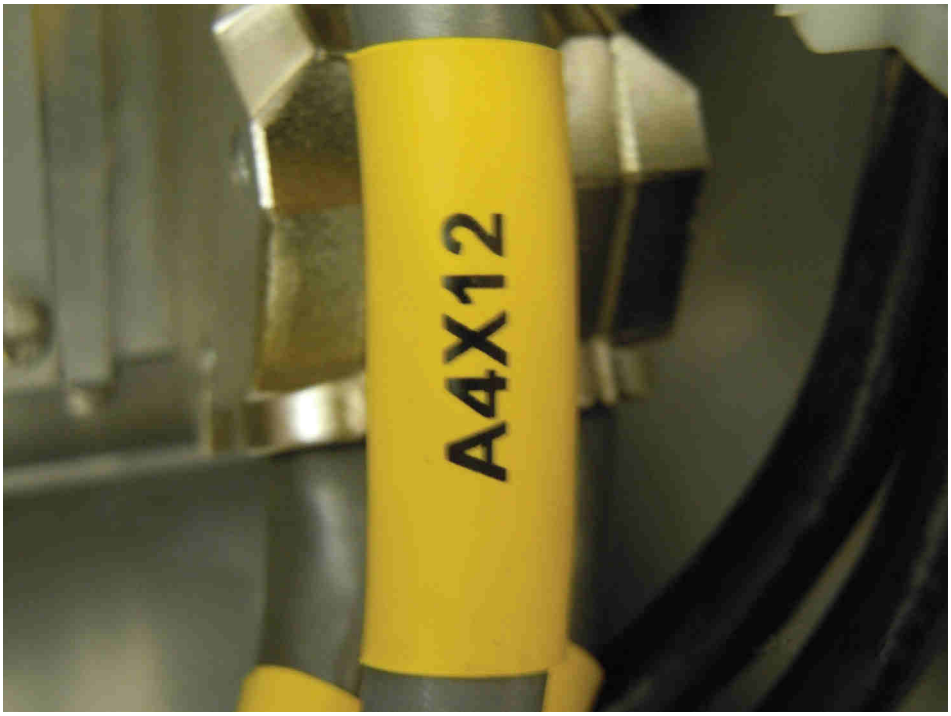


Fig. 7.10 Marking, other cables

The marking shows the module number, in this case A3 for the SMA connectors and A4 for the cable below. The following X-number tells to which connector the cable shall be connected (X11 and X12 in the first picture and X12 in the second picture.

Information as shown below about the module numbers is located on the inside of the front door.

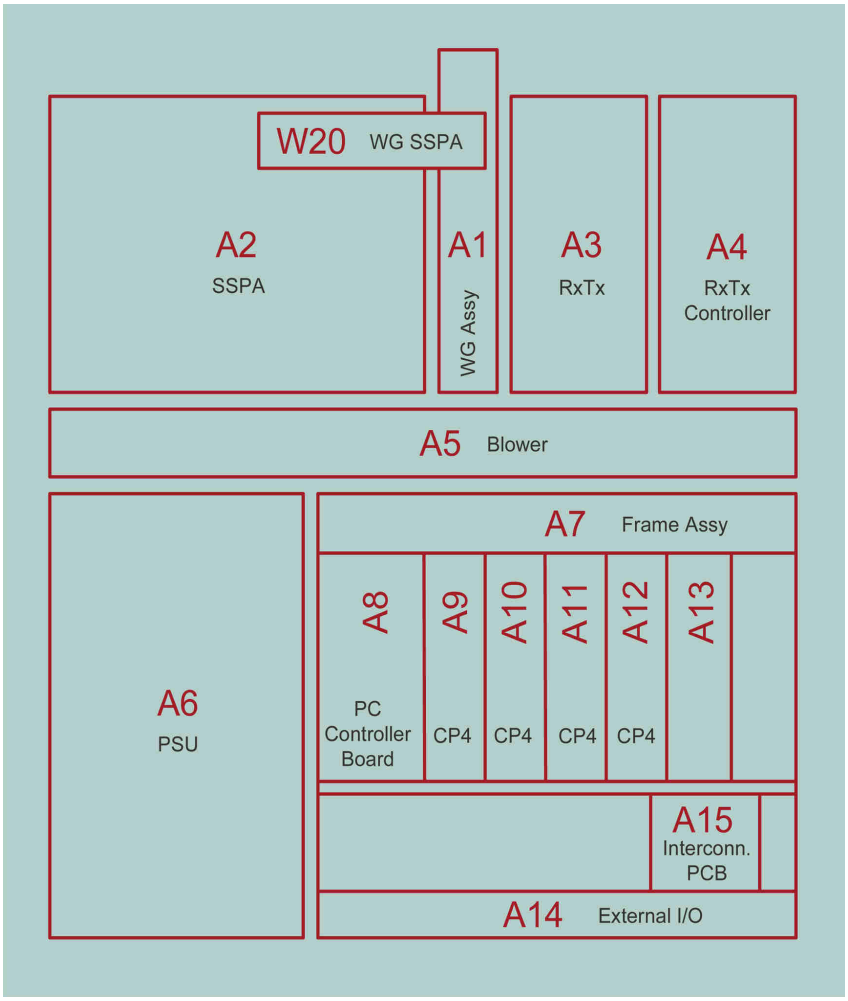


Fig. 7.11 Module numbers

7.4 Corrective maintenance tasks

Below is an overview of corrective maintenance tasks for the SCANTER 5502/5602 transceiver.

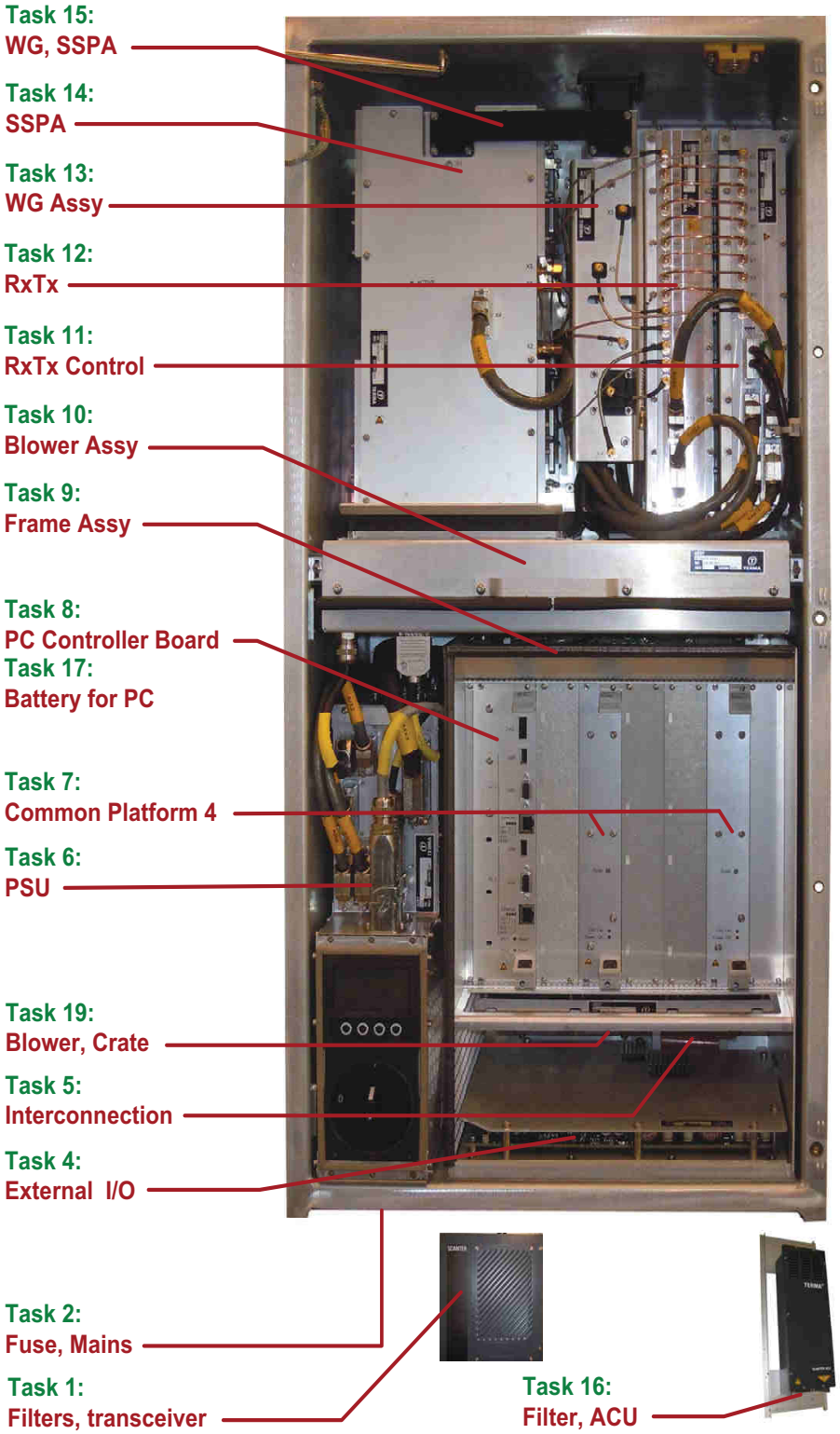


Fig. 7.12 Task overview, preventive and corrective maintenance

7.4.1 Task 1: Replace Filters, Transceiver

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Screwdriver PH1 (tools 1/4 or 9) Vacuum cleaner / Brush
Spare parts / consumables:	2 pcs. Terma no. 524884-001 (Filter)

This task can be performed without shutting down the transceiver as all the work is done from outside.

The task is the same for both filters (air inlet and air outlet) - therefore only one of the filters are shown below.

1 Using tools 1/4 or tool 9 and/or fingers, unscrew the two screws holding the filter cover - see location of the screws on Fig. 7.13 (p. 119).

2 Remove the cover.

3 The filter appears as shown in Fig. 7.14 (p. 119). Check if it is clean. If positive remount the cover and check the other filter.

4 If the filter is dusty, use a vacuum cleaner to remove the dust. Use the vacuum cleaner on the filter from the same side as the dust entered the filter.

5 Check for dust behind the filter (Fig. 7.15 (p. 119). If any, clean with the vacuum cleaner and a brush.

6 Mount the cover.

Fig. 7.13 Filter cover

Fig. 7.14 Filter

Fig. 7.15 Behind filter

7.4.2 Task 2: Replace Fuse, Mains

Refer to Fig. 7.12 (p. 118)

Tool requirements:	None
Spare parts / consumables:	Terma no. 307609-018 (Fuse 15 A, Fast, Cartridge) / Terma no. 610376-019 (Fuse 16 A, Slow, 6.3 x 32 mm)

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Turn the cap of the fuse holder counterclockwise and take out the fuse. See location of the fuse holder in Fig. 7.16 (p. 120).

4 Replace the blown fuse in the fuse holder with a new.

5 Insert fuse in the fuse holder, press the cap against the fuse holder and turn clockwise until it is tightened.

6 Turn on power to the transceiver using the power switch on the Power Supply Unit.

7 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

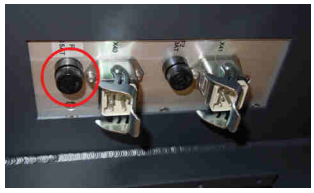


Fig. 7.16 Fuse, Mains

7.4.3 Task 4: Replace External I/O (A14)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	ESD protection (tools 15/16) Torx screwdriver T10 and T20 (tools 1/7 and 1/8) Socket wrench (tools 1/2)
Spare parts / consumables:	Terma no. 386270-004 (External I/O, A14)

For a system with **single transceiver**, start from step 1 in the procedure below.

For a system with **redundant transceivers**, do either of the following (A or B):

A If the ACU variant used has a type selector switch (fig. 7.17), switch position as follows:

- If service is to be carried out on transceiver A, switch to position 2.
- If service is to be carried out on transceiver B, switch to position 1.

  Note: Switch and wire instructions can be found on a label inside the ACU cabinet.

- When done, proceed with step 1 in the procedure below.

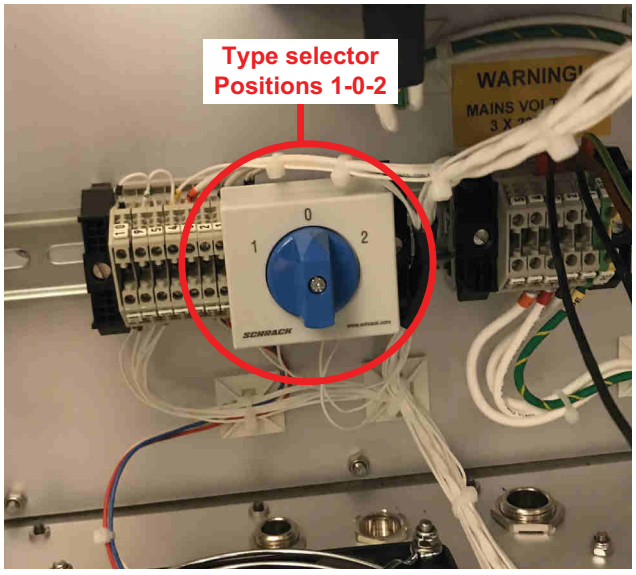


Fig. 7.17 ACU type selector switch

B If the ACU variant used does **not** have a type selector switch, be aware of two (less than a minute) down times during this maintenance task. Read the information and follow the procedure in section 7.2.2 (p. 108) and then proceed with step 3 in the procedure below.

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Remove the Blower Assy CP4 as described in “Task 19: Replace Blower Assy, CP4” on page 151 (steps 3-4).

4 Remove all cables and connections from the External I/O at the bottom of the cabinet.

Mark all connector positions to ensure that they are correctly connected after replacement.

5 Remove the two screws holding the connector for the interconnection Board to the motherboard - use Torx T10 (tools 1/7). Shown in Fig. 7.18 (p. 122).

Pull out the connector.

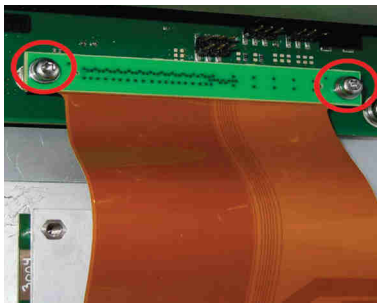


Fig. 7.18 Connector

6 From the bottom of the cabinet, remove 12 Torx T20 screws holding the External I/O board (tools 1/8). The position of the screws is shown in Fig. 7.19 (p. 122).

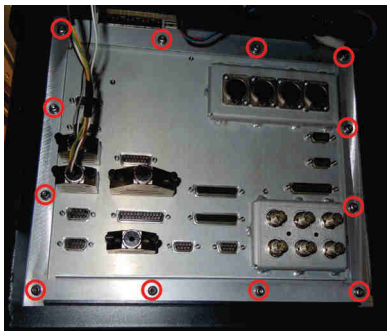


Fig. 7.19 12 screws

7 Lift the board, take it out and take it to an ESD-approved workstation.

8 Remove two screws and two nuts holding the connector and the support angle, respectively. See Fig. 7.20 (p. 122) - red circles indicate two screws on connector (tools 1/7), yellow circles indicate the two nuts holding the support angle (tools 1/2).

Move the Interconnection Board to the new External I/O and fasten the angle and the connector (tools 1/7 and 1/2).

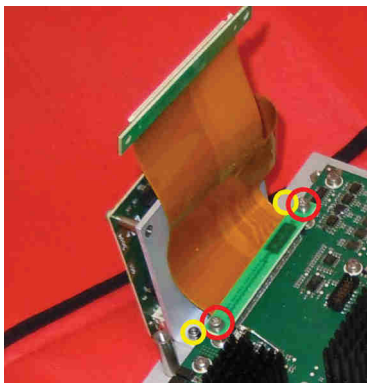


Fig. 7.20 Removal of Board

9 Put the old External I/O in an antistatic bag.

10 Place the new External I/O board with the existing interconnection Board and mount/tighten 12 screws at the bottom (tools 1/8).

11 Mount the connector of the interconnection board connector on the motherboard and fasten it with 2 Torx T10 screws (tools 1/7).

12 Re-establish all connections to the bottom of the External I/O board.

13 Mount the Blower Assy CP4 as described in “Task 19: Replace Blower Assy, CP4” on page 151 (steps 5-6).

14 **For redundant systems only:**

Follow step A or B.

A ACU variant with type selector switch:

Switch the selector back to position 0.

B ACU variant without type selector switch:

Disconnect W8 from the prepared 25 pin DSUB Male connector with two wires. Connect W8 immediately to X8 connector on the Ext. I/O module at the bottom of the cabinet.

15 Turn on power to the transceiver using the power switch on the Power Supply Unit.

16 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

17 To enter HW module information (Assy number, serial number etc.), follow the steps listed in 8.5 (p. 159).

7.4.4 Task 5: Replace Interconnection Board (A15)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	ESD protection (tools 15/16) Torx screwdriver T10 and T20 (tools 1/7 and 1/8) Socket wrench (tools 1/2)
Spare parts / consumables:	Terma no. 386275-001 (Interconnection Board, A15)

For a system with **single transceiver**, start from step 1 in the procedure below.

For a system with **redundant transceivers**, do either of the following (A or B):

A If the ACU variant used has a type selector switch (fig. 7.17), switch position as follows:

- If service is to be carried out on transceiver A, switch to position 2.
- If service is to be carried out on transceiver B, switch to position 1.

  Note: Switch and wire instructions can be found on a label inside the ACU cabinet.

- When done, proceed with step 1 in the procedure below.

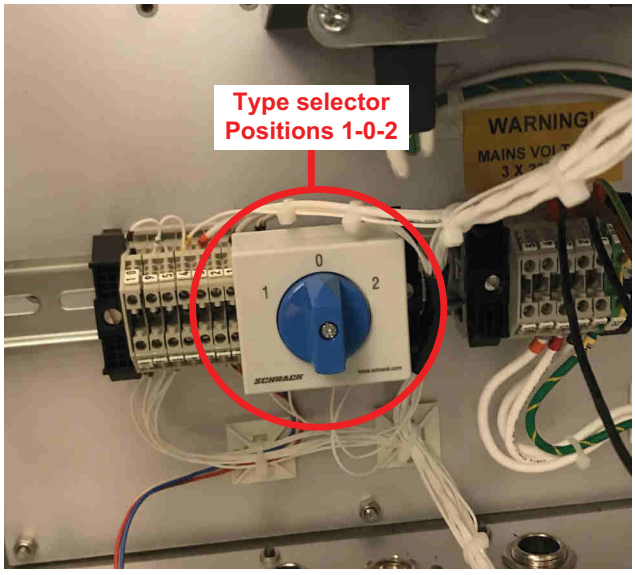


Fig. 7.21 ACU type selector switch

B If the ACU variant used does **not** have a type selector switch, be aware of two (less than a minute) down times during this maintenance task. Read the information and follow the procedure in section 7.2.2 (p. 108) and then proceed with step 3 in the procedure below.

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Remove the Blower Assy CP4 as described in “Task 19: Replace Blower Assy, CP4” on page 151 (steps 3-4).

4 Remove all cables and connections from the External I/O at the bottom of the cabinet. Mark all connector positions to ensure that they are correctly connected after replacement.

5 Remove the two screws holding the connector for the interconnection Board to the motherboard - use Torx T10 (tools 1/7).
Shown in Fig. 7.22 (p. 125).
Pull out the connector.

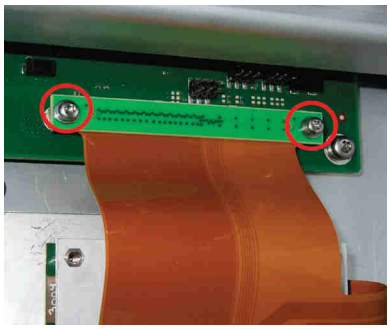


Fig. 7.22 Connector

6 From the bottom of the cabinet, remove 12 Torx T20 screws holding the External I/O board (tools 1/8). The position of the screws is shown in Fig. 7.23 (p. 125).

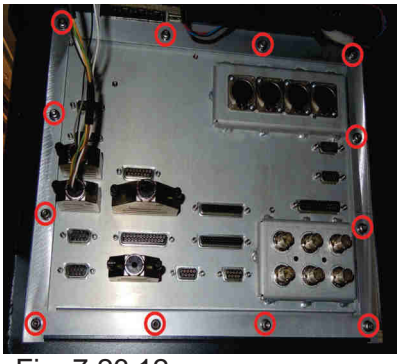


Fig. 7.23 12 screws

7 Lift the board, take it out and take it to an ESD-approved workstation.

8 Remove two screws and two nuts holding the connector and the support angle, respectively. See Fig. 7.24 (p. 125) - red circles indicate two screws on connector (tools 1/7), yellow circles indicate the two nuts holding the support angle (tools 1/2).

Mount the new interconnection Board on the External I/O and fasten the angle and the connector (tools 1/7 and 1/2).

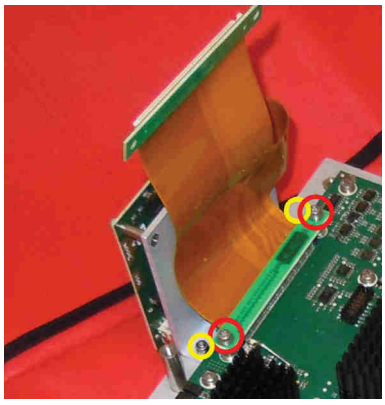


Fig. 7.24 Removal of Board

9 Put the old Interconnection Board module in an antistatic bag.

10 Place the External I/O board with the new interconnection Board and mount/tighten 12 screws at the bottom (tools 1/8).

11 Mount the connector of the interconnection Board connector on the motherboard and fasten it with 2 Torx T10 screws (tools 1/7).

12 Re-establish all connections to the bottom of the External I/O board.

13 Mount the Blower Assy CP4 as described in “Task 19: Replace Blower Assy, CP4” on page 151 (steps 5-6).

14 **For redundant systems only:**

Follow step A or B.

A ACU variant with type selector switch:

Switch the selector back to position 0.

B ACU variant without type selector switch:

Disconnect W8 from the prepared 25 pin DSUB Male connector with two wires. Connect W8 immediately to X8 connector on the Ext. I/O module at the bottom of the cabinet.

15 Turn on power to the transceiver using the power switch on the Power Supply Unit.

16 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

7.4.5 Task 6: Replace PSU (A6)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Screwdriver PH1 x 300 (tool 9) Screwdriver 3.5 x 100 (tool 11)
Spare parts / consumables:	Terma no. 386290-003 (Power Supply Unit, A6)

1 Using the Radar Service Tool, create a transceiver backup file. Use the Backup/Restore view.

Stop antenna rotation (if active) and switch “Mains Off”.

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Remove all connections from the power supply unit (tool 11) - those indicated in Fig. 7.25 (p. 127) and the connector (if optional heater is present there might be two connectors) at the bottom as well. Check marking on cables.

Fig. 7.25 Connectors

4 Using tool 9, remove the screw fixing the PSU at the bottom (front). Indicated with a red arrow in Fig. 7.26 (p. 128).

5 Using tool 9, unscrew four captive screws - two are placed at the top of the unit, two are placed at the bottom with access through two holes at the bottom of the front plate. See Fig. 7.26 (p. 128).

6 Remove the Power Supply Unit - lift it before pulling out as the connectors and fuse holders should be free of the cut-out in the cabinet.

7 Place the new PSU.

8 Fasten all five screws.

9 Mount all connectors removed earlier.

10 Turn on power to the transceiver using the power switch on the Power Supply Unit.

11 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

12 To enter HW module information (Assy number, serial number etc.), follow the steps listed in 8.5 (p. 159).

Fig. 7.26 Screws

7.4.6 Task 7: Replace Common Platform 4 (A9-A12)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	ESD protection (tools 15/16) Screwdriver PH1 (tools 1/4 or 9)
Spare parts / consumables:	Terma no. 386260-004 (Common Platform 4, A9-A13)

1 Using the Radar Service Tool, create a transceiver backup file. Use the Backup/Restore view.

Stop antenna rotation (if active) and switch “Mains Off”.

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Using tools 1/4 or tool 9, loosen the screws in the upper and lower handle, marked with 1 in Fig. 7.27 (p. 129) - these two screws are fixing the module to the frame.

Release the two handles (upper handle and lower handle) by pushing the black button into the handle - marked as “2” in Fig. 7.27 (p. 129). While doing this simultaneously on the two handles, move the upper handle upwards and the lower handle downwards (“3”). This will pull the module out of the connector.

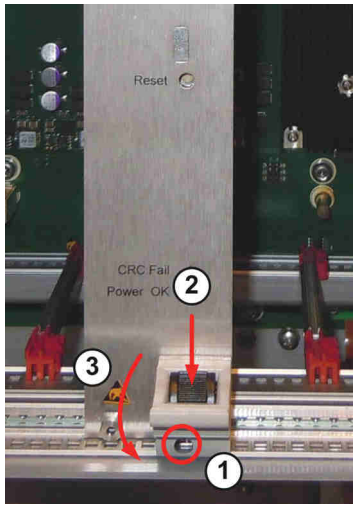


Fig. 7.27 Handle

Now the module can be removed.

4 Place the Common Platform 4 board in an antistatic bag.

5 Mount the new module in the slot - be sure to hit the upper and lower guide for proper mounting.

6 Keep the handles in the unlocked position until these reach the crate - press the two handles towards each other to move the module fully into the crate (until the connection is made on the motherboard).

7 Tighten the two screws fixing the module to the frame using tool 1/4 or tool 9.

8 Turn on power to the transceiver using the power switch on the Power Supply Unit.

The transceiver starts and automatically detects that the module needs SW. Uploading of SW to the module starts automatically and lasts several minutes. The upload of the module SW is completed when the transceiver front panel turns green.

To check the SW status of the module, open a browser window and enter the transceiver address followed by port number 8081:

http://__.__.__.__:8081/

User “admin” and password “admin”

The firmware status is found in “Operation/BITE/Status/FPGA Firmware Status” and the status is expected to show “OK”

If the firmware status of the module is not “OK”, then execute a manual module update (flash):

Open the ”Debug” view using the RST and choose the ”Force Platform Flash Update” menu.

Select “Update to Production Firmware” and click “OK”

Flashing of the system starts. When completed a message appears in the same window. Restart the transceiver.

Check the SW status of the module in “Operation/BITE/Status/FPGA Firmware Status”.

9 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

7.4.7 Task 8: Replace PC Controller Board (A8)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	ESD protection (tools 15/16) Screwdriver PH1 (tools 1/4 or 9)
Spare parts / consumables:	Terma no. 386285-003 (PC Controller Board, A8)

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Using tools 1/4 or tool 9. loosen the screws in the upper and lower handle, marked with 1 in Fig. 7.28 (p. 131) - these two screws are fixing the module to the frame.

Release the two handles (upper handle and lower handle) by pushing the black button into the handle - marked as “2” in Fig. 7.28 (p. 131). While doing this simultaneously on the two handles, move the upper handle upwards and the lower handle downwards (“3”). This will pull the module out of the connector.

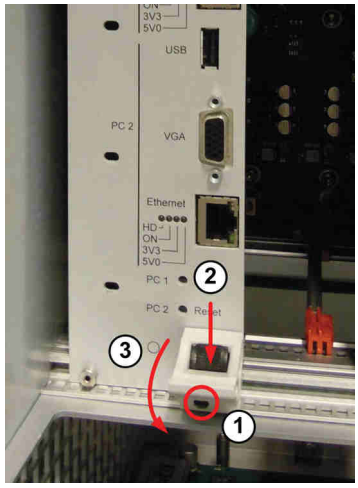


Fig. 7.28 Handle

Now the module can be removed.

4 Place the PC Controller Board in an antistatic bag.

5 Mount the new module in the slot - be sure to hit the upper and lower guide for proper mounting.

6 Keep the handles in the unlocked position until they reach the crate - press the two handles towards each other to move the module fully into the crate (until the connection is made on the motherboard).

7 Tighten the two screws fixing the module to the frame using tools 1/4 or tool 9.

8 Turn on power to the transceiver using the power switch on the Power Supply Unit. Wait for the booting of the PC to end.

9 Using the default IP address for the transceiver (this is determined by the controller board), switch “Mains On” by means of the Radar Service Tool.

10 Using Radar Service Tool, restore back-up. Settings and IP addresses are now changed to usual values.

11 If needed, select antenna rotation, Tx and profile etc.

12 To enter HW module information (Assy number, serial number etc.), follow the steps listed in 8.5 (p. 159)

7.4.8 Task 9: Replace Crate Assy (A7)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Torx T10 and T20 screwdriver (tools 1/8 and 1/7) Screwdriver PZ2 (tools 1/6) Screwdriver PZ2 (tools 1/5) Screwdriver PH1 (tools 1/4 or tool 9) Screwdriver Allen 3 mm (tools 1/3) Screwdriver, angled (tool 12) Screwdriver, 3.5 x 100 mm (tool 11)
Spare parts / consumables:	Terma no. 386265-001 (Crate Assy, A7)

The Crate Assy is carrying Motherboard, External I/O, Interconnection Board and three cables connecting to the PSU. The motherboard is part of the Crate Assy while the External I/O and the Interconnection Board are both separate LRU's. Therefore, the External I/O, the Interconnection Board (mounted on the External I/O) and the three cables have to be dismounted from the Crate Assy.

For a system with **single transceiver**, start from step 1 in the procedure below.

For a system with **redundant transceivers**, do either of the following (A or B):

A If the ACU variant used has a type selector switch (fig. 7.17), switch position as follows:

- If service is to be carried out on transceiver A, switch to position 2.
- If service is to be carried out on transceiver B, switch to position 1.

  Note: Switch and wire instructions can be found on a label inside the ACU cabinet.

- When done, proceed with step 1 in the procedure below.

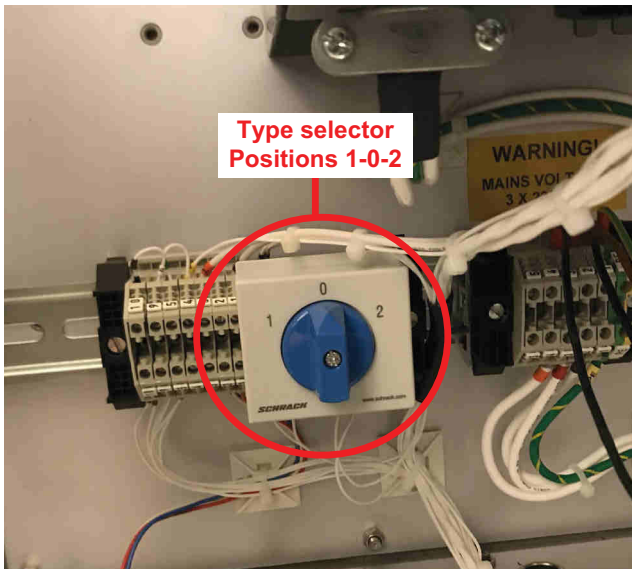


Fig. 7.29 ACU type selector switch

B If the ACU variant used does **not** have a type selector switch, be aware of two (less than a minute) down times during this maintenance task. Read the information and follow the procedure in section 7.2.2 (p. 108) and then proceed with step 3 in the procedure below.

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Remove the External I/O according to the description in Task 4 but let the Interconnection Board remain on the External I/O as both have to be mounted in the new Crate Assy.

4 Remove the Blower Assy according to the description in Task 10.

5 Remove PC Controller Board and Common Platform Boards as necessary to get access to the screws behind these modules according to respective tasks, 8 and 7. Antistatic bags !!

6 Using screwdriver (tools 1/5), loosen 10 captive screws/washers fixing the Crate Assy to the back plate.
The location of these is shown with red circles in Fig. 7.30 (p. 135). The two upper screws (dotted red circles) are accessible above the Crate Assy (marked with red circles in Fig. 7.31 (p. 135)).

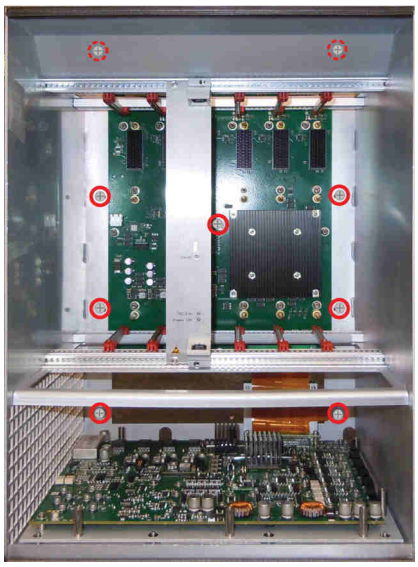


Fig. 7.30 Screws

7 Unplug X2, X3 and X4 on the PSU. These three cables are connecting to the Crate Assy. If the screws are tightened too hard, use tool 11.

8 Using Allen 3 mm screwdriver (tools 1/3), remove 5 screws and washers holding two cable supports - shown with yellow circles in Fig. 7.31 (p. 135). Remove the two cable supports.

The Crate Assy can now be moved a little outwards (only kept in place now by two cables).

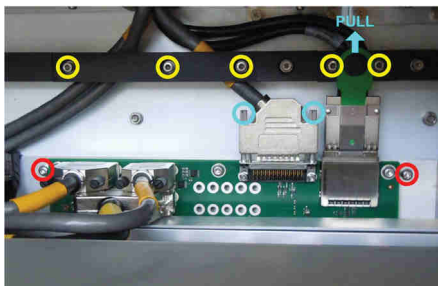


Fig. 7.31 Support and cables

9 Referring to Fig. 7.31 (p. 135), pull the green ring upwards on the rightmost connector to release it from the Motherboard (light blue arrow).

On the leftmost connector loosen the two screws (shown with light blue circles) to release it from the Motherboard. If too tight to loosen them with the fingers, use the angled screwdriver (tool 12).

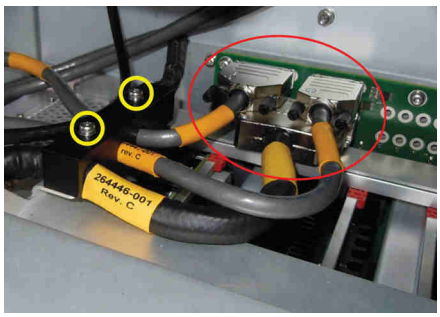


Fig. 7.32 Support, connectors

10 Take out the Crate Assy. Remove the cable support using Torx T20 screwdriver (tools 1/8) to remove two screws as indicated with yellow circles in Fig. 7.32 (p. 135). Disconnect the three connectors within the red ellipse in Fig. 7.32 (p. 135) and remove the three cables.

Re-establish the cable support without cables going through it.

11 Connect the three cables on the new Crate Assy and fix them with the cable support (Fig. 7.32 (p. 135)). Place the new Crate Assy in RxTx.

12 Mount the connectors removed in step 9 and mount the cable supports removed in step 8 (Fig. 7.31 (p. 135)).

13 Connect X2, X3 and X4 on the PSU.

14 Fix the Crate Assy with the ten screws (step 6).

15 Replace the PC Controller Board and the CP4 Boards.

16 Mount the Blower Assy and connect to PSU.

17 Mount the external I/O and Interconnection Board and re-establish all connections to the bottom of cabinet.

18 For **redundant** system only:

Disconnect W8 from the prepared 25 pin DSUB Male connector with two wires. Connect W8 immediately to X8 connector on the Ext. I/O module at the bottom of the cabinet.

19 Turn on power to the transceiver using the power switch on the Power Supply Unit.

20 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

7.4.9 Task 10: Replace Blower Assy (A5)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Screwdriver, PH1 (tools 1/4 or 9) Screwdriver, 3.5 x 100 (tool 11) Allen Key, 2 mm (tool 18)
Spare parts / consumables:	Terma no. 386298-001 (Blower Assy, A5)

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”.

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 On the power supply unit, remove the connection to the blower assy - the location of the connector is shown in Fig. 7.33 (p. 137). Use tool 11 if the screw is tightened too hard.

Fig. 7.33 Connector

4 On the left and right sides of the Blower Assy, two pointed screws are fastening the Blower Assy in place. See Fig. 7.34 (p. 137).

Remove the two screws using tool 18 out the Blower Assy together with its cable.

Fig. 7.34 Screws

5 Slide in the new unit - a horizontal slot on the left and right sides will guide the assy. Make sure that the cable follows the unit in.

6 Secure its position by mounting angles and screws in each side.

7 Mount the connector on the power supply unit.

8 Turn on power to the transceiver using the power switch on the Power Supply Unit.

9 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile)

10 To enter HW module information (Assy number, serial number etc.), follow the steps listed in 8.5 (p. 159).

7.4.10 Task 11: Replace RxTx Control (A4)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	ESD protection (tools 15/16) Moment spanner, 1 Nm (tool 13) Extension, moment spanner (tool 14) Screwdriver PH1 x 300 (tool 9) Screwdriver 3.5 x 100 (tool 11)
Spare parts / consumables:	Terma no. 386222-003 (RxTx Control, A4)

1 Using the Radar Service Tool, create a transceiver backup file. Use the Backup/Restore view.

Stop antenna rotation (if active) and switch “Mains Off”.

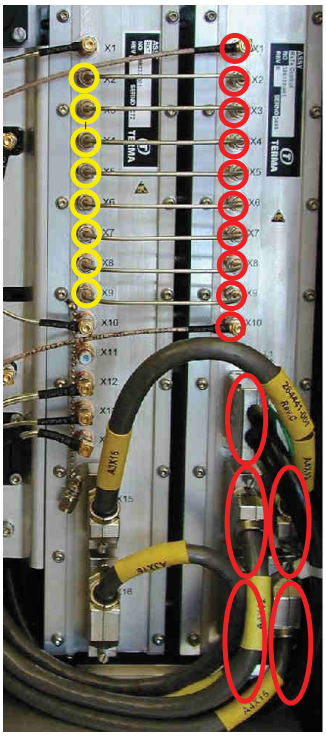


Fig. 7.35 Connectors

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 On RxTx Control, loosen all SMA connectors (X1 - X10) using tools 13/14, four D-Sub connectors (X12, X13, X14, X15) using tool 11 and one PCIe connector (X11) as indicated on the RxTx Control module with red circles and ellipses - see Fig. 7.35 (p. 138).

The PCIe connector is unplugged by pulling outwards in the green plastic ring on the side of the connector.

Avoid bending the semi-rigid cables!!

4 On the RxTx to the left of the RxTx Control, loosen SMA connectors X2 - X9 to remove or turn the semi-rigid cables so the RxTx Control can be pulled out without any obstructions - use tools 13/14. Indicated with yellow circles in Fig. 7.35 (p. 138).

5 Loosen the 4 captive screws holding the RxTx Control to the back of the cabinet (tool 9).
2 screws are located at the top and 2 screws are located at the bottom as indicated in Fig. 7.36 (p. 139).

6 Take out the RxTx Control module and put it in an antistatic bag.

7 Mount the new RxTx Control module and fasten it with the 4 captive screws loosened in step 5 using tool 9.

8 Mount and tighten all SMA connectors (X1 - X10) using tools 13/14.
Mount four D-Sub connectors (X12, X13, X14, X15) using tool 11 and mount one PCIe connector (X11) by simply pushing it into the connector.

9 On the RxTx, tighten SMA connectors X2 - X9 using tools 13/14.

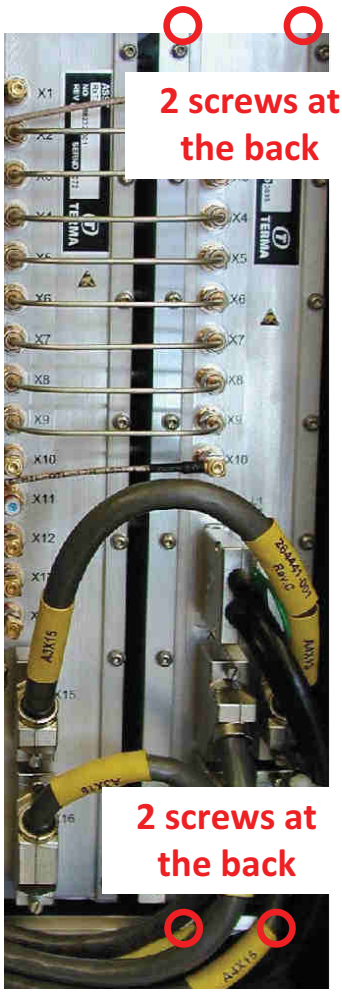


Fig. 7.36 Screws

10 Turn on power to the transceiver using the power switch on the Power Supply Unit.

The transceiver starts and automatically detects that the module needs SW. Uploading of SW to the module starts automatically and lasts several minutes. The upload of the module SW is completed when the transceiver front panel turns green.

To check the SW status of the module, open a browser window and enter the transceiver address followed by port number 8081:

http://__.__.__.__:8081/

User “admin” and password “admin”.

The firmware status is found in “Operation/ BITE/Status/FPGA Firmware Status” and the status is expected to show “OK”

If the firmware status of the module is not “OK”, then execute a manual module update (flash):

Open the ”Debug” view using the RST and choose the ”Force Platform Flash Update” menu.

Select “Update to Production Firmware” and click “OK”

Flashing of the system starts. When completed, a message appears in the same window. Restart the transceiver.

Check the SW status of the module in “Operation/BITE/Status/FPGA Firmware Status”.

11 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

12 Make a PSAT calibration of the SSPA. (For details on the procedure, see 8.9 (p. 164).

13 To enter HW module information (Assy number, serial number etc.), follow the steps listed in 8.5 (p. 159).

7.4.11 Task 12: Replace RxTx (A3)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	ESD protection (tools 15/16) Moment spanner, 1 Nm (tool 13) Extension, moment spanner (tool 14) Screwdriver PH1 x 300 (tool 9) Screwdriver 3.5 x 100 (tool 11)
Spare parts / consumables:	Terma no. 386232-001 (RxTx, A3)

1 Using the Radar Service Tool, create a transceiver backup file. Use the Backup/Restore view.

Stop antenna rotation (if active) and switch “Mains Off”.

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Loosen X6 on the Waveguide Assy and X14 on RxTx using tools 13/14 and remove the small cable.
Mount the termination on X14 (this is attached the RxTx with a chain).

To avoid damage of the RxTx, it is important to mount the termination, as the X14 input has a very high impedance. See Fig. 7.38 (p. 141).

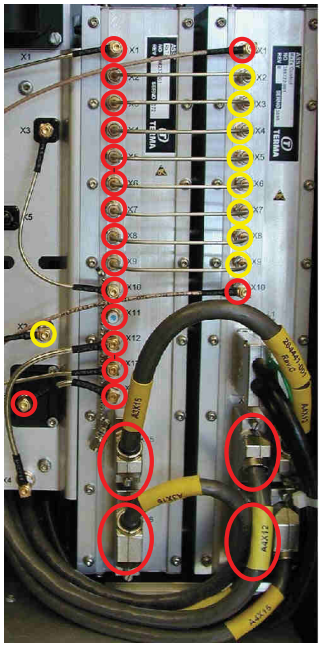


Fig. 7.37 Connectors

4 On RxTx, loosen all SMA connectors (X1 - X14) using tools 13/14 and two D-Sub connectors (X15 - X16) using tool 11 as indicated on the RxTx module with red circles and ellipses - see Fig. 7.37 (p. 141).

Avoid bending the semi-rigid cables!!

5 On the RxTx Controller, loosen and remove SMA connectors X1 and X10 and D-Sub connectors X12 and X14 as these might obstruct free passage for the RxTx when pulled out.

Fig. 7.38 Termination

6 On the RxTx Controller, loosen SMA connectors X2 - X9 to remove or turn the semi-rigid cables allowing the RxTx to be pulled out (yellow circles in Fig. 7.37 (p. 141)).

7 On the Waveguide Assy, loosen X2 (only loosen slightly), so the cable can be turned away from RxTx.

8 Loosen the 4 captive screws holding the RxTx to the back of the cabinet.

2 screws at the top and 2 screws at the bottom as indicated in Fig. 7.39 (p. 142). Use tool 9.

9 Take out the RxTx module.

10 Mount the new RxTx module and fasten it with the 4 captive screws loosened in step 8 - use tool 9.

11 On the RxTx Controller, mount and tighten SMA connectors X1, X10 and D-Sub connectors X12 and X14. Use tools 13/14 and tool 11, respectively.

12 On the Waveguide Assy, tighten X2 using tools 13/14.

13 Dismount the termination from X14 on the RxTx module and mount the small cable from Waveguide Assy X6 to RxTx X14. Use tools 13/14 to tighten.

14 On RxTx, mount and tighten all remaining SMA connectors (X1 - X13) and two D-Sub connectors (X15 - X16).

Use tools 13/14 and 11, respectively.

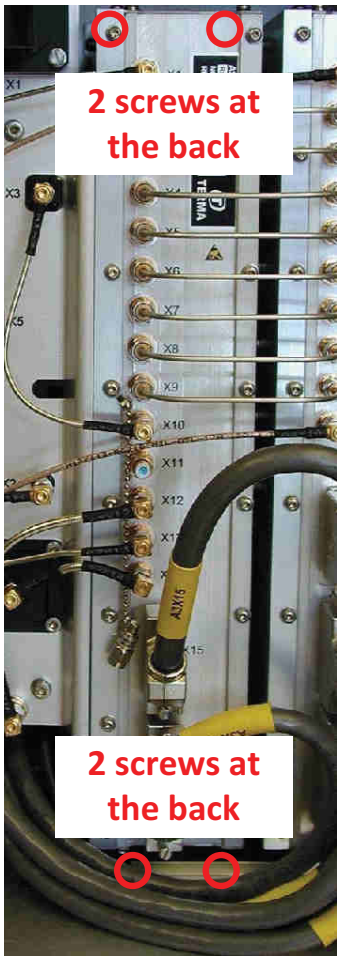


Fig. 7.39 Screws

15 On the RxTx Controller, tighten SMA connectors X2 - X9 using tool 13/14.

16 Turn on power to the transceiver using the power switch on the Power Supply Unit.

The transceiver starts and automatically detects that the module needs SW. Uploading of SW to the module starts automatically and lasts several minutes. The upload of the module SW is completed when the transceiver front panel turns green.

To check the SW status of the module, open a browser window and enter the transceiver address followed by port number 8081:

http://__.__.__.__:8081/

User “admin” and password “admin”

The firmware status is found in “Operation/BITE/Status/FPGA Firmware Status” and the status is expected to show “OK”

If the firmware status of the module is not “OK”, then execute a manual module update (flash):

Open the ”Debug” view using the RST and choose the ”Force Platform Flash Update” menu.

Select “Update to Production Firmware” and click “OK”

Flashing of the system starts. When completed, a message appears in the same window. Restart the transceiver.

Check the SW status of the module in “Operation/BITE/Status/FPGA Firmware Status”.

17 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

18 Make a PSAT calibration of the SSPA. (For details on the procedure, see 8.9 (p. 164).

19 To enter HW module information (Assy number, serial number etc.), follow the steps listed in 8.5 (p. 159)

7.4.12 Task 13: Replace Waveguide Assy (A1)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Screwdriver, PH1 (tool 9) Screwdriver PZ2 (tools 1/6) Moment spanner, 1 Nm (tool 13) Extension, moment spanner (tool 14) Flexible screwdriver, 6 mm (tool 10)
Spare parts / consumables:	Terma no. 386240-002 (Waveguide Assy, A1) 1 pc. Cable strap, Terma no. 201197-010

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”.

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Remove Waveguide SSPA according to Task 15. Use tool 10.

It might not be necessary to remove more units, but to have more space, the Blower Assy and the SSPA can be removed. In this case, execute steps 4 and 5, or continue with step 6.

(4) Remove Blower Assy according to Task 10.

(5) Remove SSPA according to Task 14.

6 Using tool 13/14, loosen and remove all SMA connectors from the waveguide assy (X3, X2, X6 and X4) together with X14 on RxTx (and remove the small cable).
All these connections to be removed are shown with red circles on Fig. 7.40 (p. 144).

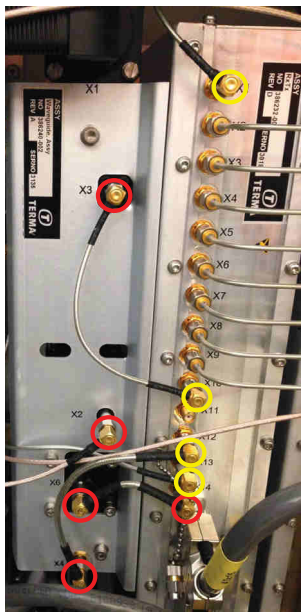


Fig. 7.40 Connectors

7 Mount the termination on X14 on RxTx. The termination is attached to RxTx with a chain. See Fig. 7.41 (p. 144).

8 Loosen SMA connectors on RxTx marked with a yellow circle (X1, X10, X12, and X13) - see Fig. 7.40 (p. 144) and turn the cables upwards or downwards so the waveguide assy has free passage when it is taken out. For doing this, the connectors should be loosened just a little bit. Use tools 13/14.

Fig. 7.41 Termination

9 In the cable tray at the bottom of the Waveguide Assy, cut the cable strap holding the cables to the assy. See Fig. 7.42 (p. 145).

10 Remove the waveguide connector coming from the installation to get acces to the top flange of the Waveguide Assy. Using tools 1/6, loosen and remove the four screws holding the top flange. See Fig. 7.43 (p. 145).

11 Loosen the four screws fixing the Waveguide Assy to the back - see Fig. 7.44 (p. 145). The two lower screws are accessible through the cable tray at the bottom - the two upper screws are accessible through the two slots on the front plate indicated in Fig. 7.45 (p. 145). All four screws are captive. Use tool 9.

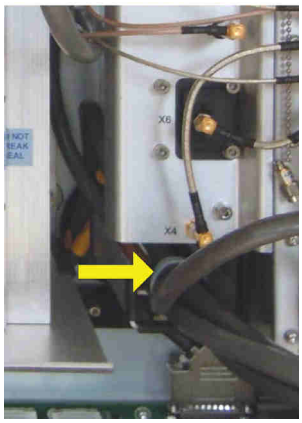


Fig. 7.42 Cable strap

12 Pull old unit downwards and out and place the new - ensure that the top flange is guided properly through the circular cut-out in the top of the cabinet.

13 Mount and tighten the four screws holding the top flange to the cabinet (tools 1/6) and mount the waveguide connector. Check that the O-ring is placed correctly.

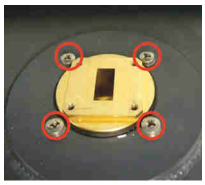


Fig. 7.43 Top flange

14 Tighten the four screws holding the unit to the back (tool 9).

15 Mount a new cable strap to fix the cables to the cable tray at the bottom of the assy.

16 Mount and tighten the connectors X3, X5, X2 and X4 (tools 13/14).
Remove the termination on RxTx X14 and mount the small cable between X6 (Waveguide Assy) and X14 (RxTx) and tighten (tools 13/14).
Tighten connectors X1, X10, X12 and X13 on the RxTx (tools 13/14).

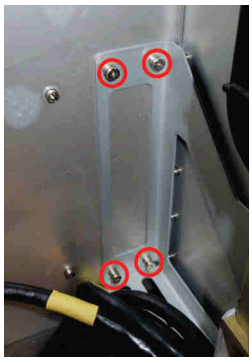


Fig. 7.44 4 screws

17 Mount SSPA and Blower Assy according to Task 14 and 10, respectively, if these have been removed

18 Mount Waveguide SSPA according to Task 15.

19 Turn on power on the mains switch on the PSU.

20 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

21 To enter HW module information (Assy number, serial number etc.), follow the steps listed in 8.5 (p. 159).

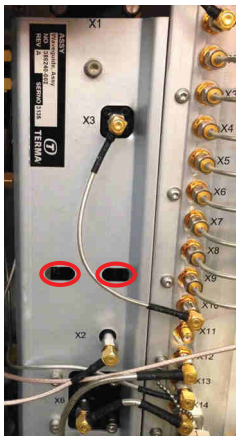


Fig. 7.45 Two slots

7.4.13 Task 14: Replace SSPA (A2)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Screwdriver, PH2 (tool 9) Moment spanner, 1 Nm (tool 13) Screwdriver, 3.5 x 100 (tool 11)
Spare parts / consumables:	Terma no. 386255-002 (SSPA, short range, A2) **or** Terma no. 386250-002 (SSPA, long range, A2)

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Remove Waveguide SSPA according to Task 15.

4 Remove Blower Assy according to Task 10.

5 Unscrew and unplug D-Sub connector X4 using tool 11.
Unscrew and unplug the three SMA connectors X2, X3 and X5 using tool 13.
See Fig. 7.46 (p. 146).

X2 connects to RxTx, X1
X3 connects to RxTx, X13
X5 connects to RxTx Control, X10

Fig. 7.46 Connectors

6 On the PSU, unplug the Harting connector supplying the SSPA. See Fig. 7.47 (p. 146).

7 The SSPA module is fixed to the cabinet with eight screws, four to the left and four to the right. The left side screws of the SSPA is shown in Fig. 7.48 (p. 147) and the right side is equal to the left side - the screws in red circles must be loosened totally while the screw in yellow circle should be left untouched. The SSPA module can “hang” in the “yellow” screws.

Using tool 9, loosen the screws according to the above mentioned and let the SSPA hang in the “yellow” screws.

Lift the SSPA module and take it out.

Fig. 7.47 SSPA supply

8 Mount the new unit - fasten it to the back with all eight screws.

9 Mount the Harting connector in the PSU.

10 Mount the D-Sub connector (X4) and three SMA connectors (X2, X3 and X5).

11 Mount the Blower Assy according to Task 10.

12 Mount the Waveguide SSPA according to Task 15.

13 Turn on power on the mains switch on the PSU.

14 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

15 Make a PSAT calibration of the SSPA. (For details on the procedure, see 8.9 (p. 164).

Fig. 7.48 6 screws

7.4.14 Task 15: Replace Waveguide, SSPA

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Flexible screwdriver, 6 mm (tool 10)
Spare parts / consumables:	Terma no. 524894-001 (Waveguide, SSPA)

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Remove eight screws holding the waveguide assembly and remove it. Use tool 10.
See Fig. 7.49 (p. 148)

4 Mount the new waveguide assembly, mount and tighten the eight screws using tool 10.

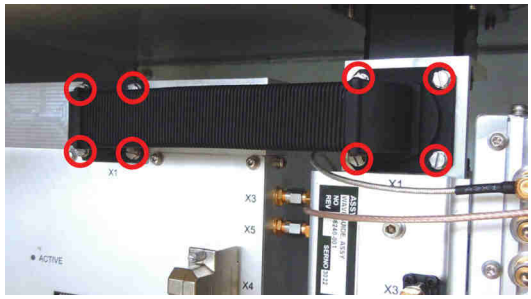


Fig. 7.49 WG SSPA, screws

5 Turn on power to the transceiver using the power switch on the Power Supply Unit.

6 Switch “Mains On” by means of the Radar Service Tool (if needed, select antenna rotation, Tx and profile).

7.4.15 Task 16: Replace Filter, ACU

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Screwdriver PH1 (tool 9) Vacuum cleaner Brush
Spare parts / consumables:	1 pc. Terma no. 262394-001 (Filter)

This task can be performed without shutting down the ACU, as all the work is done from outside.

1 Use a screwdriver (tool 9) and/or fingers to unscrew the four screws holding the filter cover - see location of the screws on Fig. 7.50 (p. 149).

2 Remove the cover.

3 The filter appears. Check if it is clean. If positive remount the cover.

4 If the filter is dusty, use a vacuum cleaner to remove the dust. Use the vacuum cleaner on the filter on the same side as the dust came in.

If necessary, replace the filter.

5 Check for dust behind the filter. If any, clean with the vacuum cleaner and a brush.

6 Mount the cover.

Fig. 7.50 4 screws

7.4.16 Task 17: Replace Battery, PC Controller Board (A8)

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	ESD protection (tools 15/16) Screwdriver PH1 (tool 9)
Spare parts / consumables:	Terma no. 519886-001 (battery, lithium) Terma no. 201197-049 (cable strap, Ø20 x 2.5)

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Take out the PC Controller Board according to Task no. 8 and place it on an ESD-approved workstation.

4 Locate the green, cylindrical battery fastened to the PC Board with a cable strap. See Fig. 7.52 (p. 150).

5 Cut the strap fixing the battery to the PC Board, disconnect the red/black wire from the connector and remove the battery.

6 Place the new battery in same position as the old battery and fix it with a cable strap - cut the strap where necessary.

Fig. 7.51 PC Board

7 Connect the red/black wire to the connector.

8 Mount the PC Controller Board in the crate according to Task 8.

9 Turn on power to the transceiver using the power switch on the Power Supply Unit.

10 Switch “Mains On” by means of the Radar Service Tool.

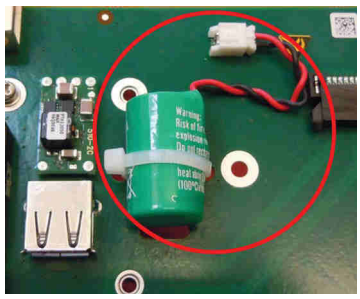


Fig. 7.52 Battery

11 Set up date and time in the operational system.

12 If needed, select antenna rotation, Tx and profile.

7.4.17 Task 19: Replace Blower Assy, CP4

Refer to Fig. 7.8 (p. 115) and Fig. 7.12 (p. 118)

Tool requirements:	Ratchet and bit Torx T10 (tools 17/7)
Spare parts / consumables:	Terma no. 386268-001 (Blower Assy, CP4)

1 Using the Radar Service Tool, stop antenna rotation (if active) and switch “Mains Off”

2 Turn off power to the transceiver using the power switch on the Power Supply Unit.

3 Disconnect the connection to the blower assy. The connector is to the left of the blower assy. See Fig. 7.53 (p. 151)

Fig. 7.53 Connector

4 Using tool 17, rachet and tool 7, Torx T10, remove the four screws holding the blower assy (the four screws which are holding the assy to four spacers). See the location of the four screws on Fig. 7.54 (p. 151).

5 Mount the new Blower Assy with the four screws.

Fig. 7.54 Screws, 4 pcs.

6 Re-establish the connection to the blower.

7 Turn on power to the transceiver using the power switch on the Power Supply Unit.

8 Switch “Mains On” by means of the Radar Service Tool.

9 If needed, select antenna rotation, Tx and profile.

(Intentionally left blank)

8 Transceiver setup and adjustments

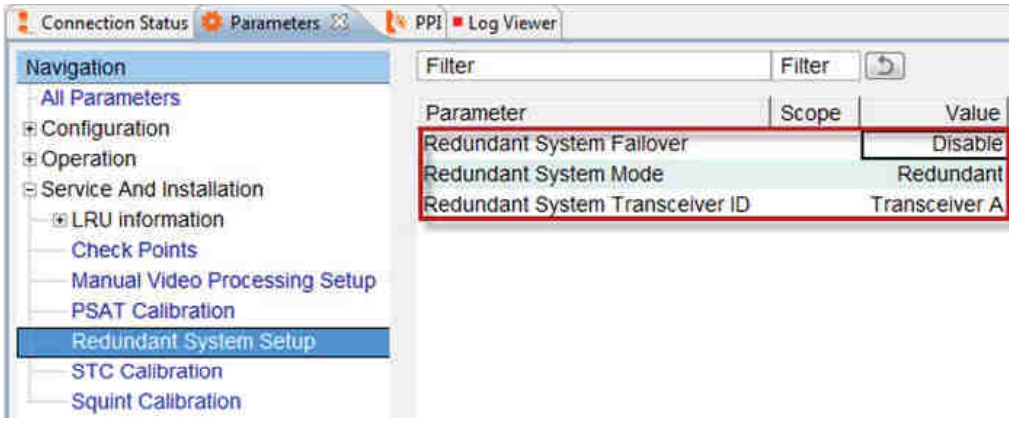
8.1 Setting up transceiver redundancy (redundant systems only)

If the transceiver is part of a redundant system setup, observe the following points:

- A direct network connection should be established between network interface X14 on the two transceivers.
- The configuration parameter “Redundant System Mode” must be set to "Redundant".

Menu: Window / Show View / Parameters

Navigation window: Service And Installation / Redundant System Setup



1	On transceiver A, set "Redundant System Mode" to "Redundant".
2	Set "Redundant System Failover" to "Disable". This will be enabled later during the procedure.
3	Set "Redundant System Transceiver ID" to "Transceiver A".
4	On transceiver B, set “Redundant System Mode" to "Redundant".
5	Set "Redundant System Failover" to "Disable". This will be enabled later during the procedure.
6	Set "Redundant System Transceiver ID" to "Transceiver B".

To enable automatic failover, the following conditions must be fulfilled:

- No critical errors must be present in **EITHER** transceiver.
- Mains must be set to “On” in **BOTH** transceivers.
- “Redundant System Failover” must be set to “Enable” in **BOTH** transceivers.

When failover has been successfully enabled, “Redundant System Status" (in the Status and Measurement view) changes to "Operational" and "Redundant System Failover Disabled Warning" is no longer reported.

8.2 Transceiver redundancy test (redundant systems only)

1	Make sure that the direct network LAN connection between the transceivers is established and that the ACU is connected to both transceivers.
2	Check that "Redundant System Mode" is set to "Redundant" on both transceivers.
3	With mains on, set "Redundant System Failover" on both transceivers to "Enable".
4	With transceiver A as active, start the antenna and transmission.
5	Inspect that radar video is present on transceiver A.
6	From transceiver A check that the RPM value can be changed and inspect correct antenna tell-back value. Set RPM value to normal operation again.
7	Force a critical BITE error on transceiver A by setting "Forward Power Offset" to -100 W, thus forcing a "Forward Power Too Low" BITE error on transceiver A.

When the BITE error appears, verify that:

8	“Redundant System Role" of the two transceivers now has interchanged.
9	The waveguide switch has changed position to transceiver B.
	Transceiver B is transmitting and distributing video.
10	"Redundant System Status" is "Degraded" in transceiver A.
11	"Redundant System Failover" in both transceivers is "Disabled"

12	From transceiver B, stop antenna and transmission.
13	Repeat the above procedure for transceiver B.

8.3 Radar control

When the Mains switch on the transceiver is turned to the off position, the transceiver is in the “Off” state where it cannot function or be reached from remote.

The transceiver can enter any of the four states shown in the below table:

		Radar control view in the Radar Service Tool		
Transceiver states	Mains switch	Mains	Antenna	Transmission
Off	Off	-	-	-
Minimum functioning	On	Off	Off	Off
Mains on	On	On	Off	Off
Fully functioning	On	On	On	On

The “Minimum functioning” state is entered when the transceiver Mains switch is set to “On”. The transceiver starts a booting procedure that may last for 3-5 minutes. The transceiver is checking the presence and condition of all hardware modules. In this state, the LAN ports on the External I/O module are up and running. An RST client can then connect to the transceiver through the LAN network.

The "Radar Control" view is used for switching on and off the system, switching on/off the antenna motor, the transmitter, and sector transmission.

To change transceiver configuration, the "Profile" drop-down menu gives the possibility to select one of sixteen predefined profiles (see Fig. 8.1 (p. 155)).

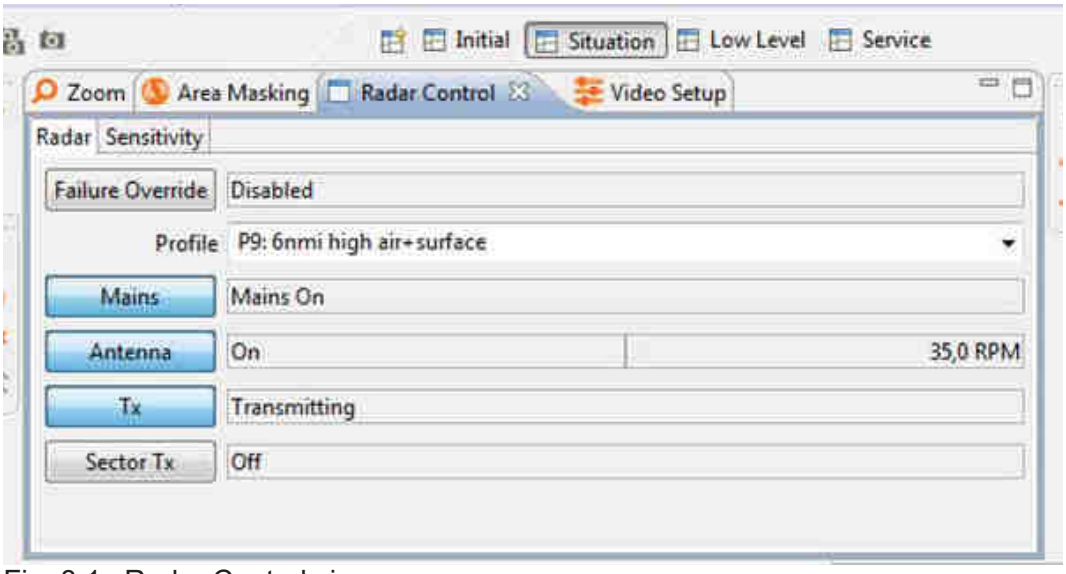


Fig. 8.1 Radar Control view

"Mains" gives the possibility to switch the system on and off. The read-only box to the right provides information about the system status (mains off/on, initializing).

With "Antenna" it is possible to switch on and off the antenna motor - to the right is shown the actual antenna rotation speed in RPM.

With "Tx" it is possible to switch on and off the transmitter and to the right is shown the status of the transmitter (transmitting, stand by etc.).

"Sector Tx" switches on and off the sector transmission and will affect all sectors enabled.

To adjust attenuation and gain for surface video, use the Radar Control view - Sensitivity. Note: Manual adjustment of STC and Gain is not supported for the SCANTER 5502/5602. See Fig. 8.2 (p. 156).

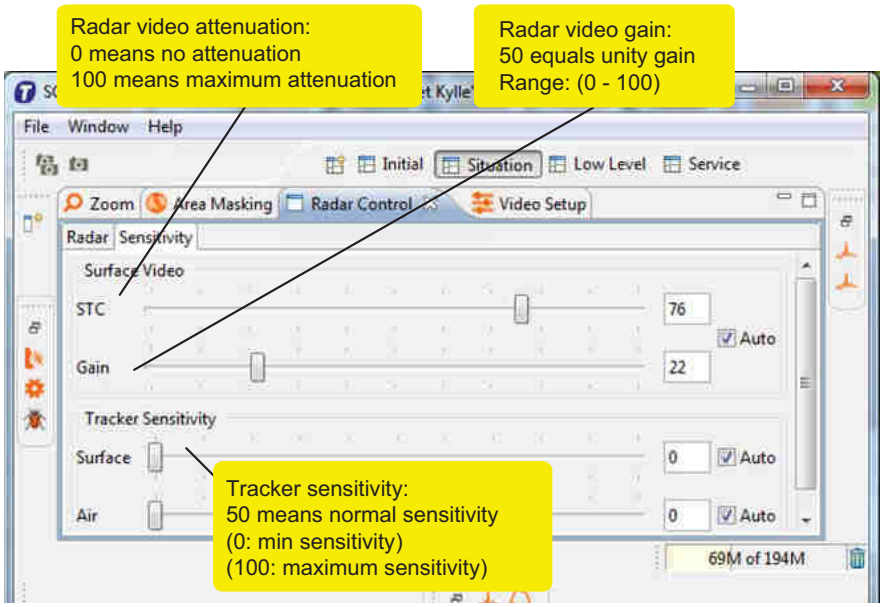


Fig. 8.2 “Radar Control” - sensitivity

Manual adjustment of tracker sensitivity for surface and air channels or select auto for auto adjustments (recommended).

8.3.1 Start transceiver - single

1	Turn on power to the transceiver using the power switch on the Power Supply Unit. Turn on power to the ACU using the power switch placed at the bottom of the ACU cabinet.
2	Use the RST “Connection Manager” view to establish a connection from RST to the transceiver.
3	Switch “Mains” on by means of the RST ”Radar Control” view, select “antenna”, “Tx” and an appropriate profile. See Fig. 8.1 (p. 155) Enable sector transmission if created and needed.

8.3.2 Stop transceiver - single

1	Use the RST “Connection Manager” view to establish a connection from the RST to the transceiver.
2	Switch off “Tx”, “Antenna” and “Mains”
3	Turn off power to the transceiver using the power switch on the Power Supply Unit. Turn off power to the ACU using the power switch placed at the bottom of the ACU cabinet.

8.3.3 Start transceivers - redundant

1	Turn on power to the transceiver A and transceiver B, using the power switch on the Power Supply Unit. Turn on power to the ACU using the power switch placed at the bottom of the ACU cabinet.
2	Use the RST “Connection Manager” view to establish a connection from RST to transceiver A.
3	Switch “Mains” on by means of the RST-”Radar Control” view, select “antenna”, “Tx” and an appropriate profile. See Fig. 8.1 (p. 155) Enable sector transmission if created and needed.
4	Enable automatic switch-over function. Note: There should be no critical errors on transceiver A or B. In the “Redundant System Failover” parameter, select “Enable”. *Menu: Window / Show View / Parameters* *Navigation window: Service And Installation / Redundant System Setup.*
5	Use the RST “Connection Manager” view to establish a connection from RST to transceiver B.
6	Switch “Mains” on by means of the RST-”Radar Control” view, select “antenna”, “Tx” and an appropriate profile. See Fig. 8.1 (p. 155) Enable sector transmission if created and needed.
7	Enable automatic switch-over function. Note: There should be no critical errors on transceiver A or B. In the “Redundant System Failover” parameter, select “Enable”. *Menu: Window / Show View / Parameters* *Navigation window: Service And Installation / Redundant System Setup.*

8	Activate transceiver A or B. See section 8.3.4 (p. 158)

8.3.4 How to activate a transceiver (redundant systems only)

1	To make a transceiver active, connect the RST to the transceiver in question (transceiver A or transceiver B). Note: There should be no critical errors on transceiver A or B.
2	In the “Redundant System Failover” parameter, select “Force”. *Menu: Window / Show View / Parameters* *Navigation window: Service And Installation / Redundant System Setup*

8.4 Create sectors

In the “Parameters” view - Sectors, it is possible to set up sixteen independent sectors, selected as transmission sectors, prohibit sectors or reduced power transmitting sectors. All available as stabilized or not stabilized sectors.

A stabilized sector is always kept relative to north. Unstabilized sectors will follow the moving platform when it is turning, i.e. they are not kept relative to north.

When setting up a sector it is necessary to know or to calculate the bearing of the sector, i.e. the middle. In the same way it is necessary to know or to calculate the width (extent) of the sector (in degrees). See Fig. 8.3 (p. 158).

A prohibit sector is a non-transmission sector.

By selecting reduced power sector, it is possible to transmit with reduced power. Power attenuation is selectable in the interval 0..15.5 dB.

Note! Prohibit sectors have priority over transmission sectors, which should be considered when all types of sectors are mixed on a moving platform.

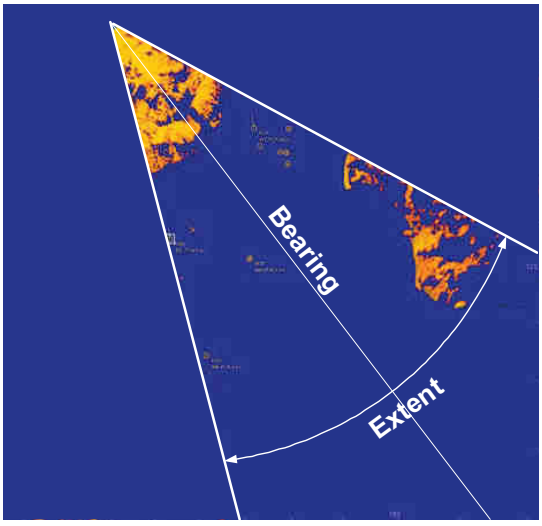


Fig. 8.3 Sector Bearing and Width

Sector bearing:	0..359 degrees
Sector width:	10.. 350 degrees
Sector mode:	Disabled, prohibited, reduced power sector, transmitting sector
Azimuth mode	Stabilized or unstabilized
Sector attenuation	0..31 dB

8.5 Entering HW module information

For some LRU's, it might be necessary to enter LRU information after replacement of the LRU manually. The affected modules are the Ext. IO, the PC Controller Board, the PSU, the RxTx, the RxTx Controller, the Waveguide Assy and the Blower Assy.

1	To enter LRU information, open the "Debug" view using the RST and choose " #LRU Information and Calibration"
2	Select the relevant module and enter all the modules information.
3	To store the module information, click on "Save".

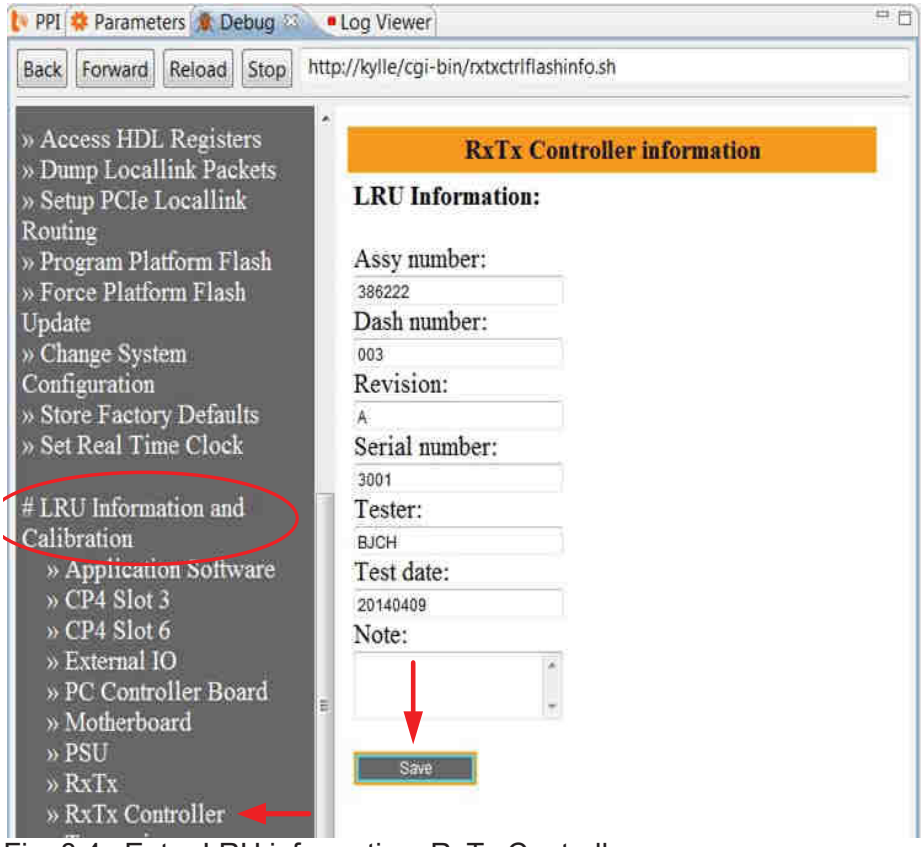


Fig. 8.4 Enter LRU information, RxTx Controller

8.6 Backup/Restore

The backup and restore functions in the RST provide backup and restore facilities for the SCANTER 5502/5602 radar system.

The transceiver contains the application SW, factory default data, transceiver configuration data and site default data. Furthermore, some space is allocated for log files (i.e. performance and measurement data) and temporary files. See Fig. 8.5 (p. 160).

The data set currently being used by the transceiver is stored in the “transceiver configuration” memory area.

The “Site Default” data area is used to store a copy of the “transceiver configuration”. It is recommended to copy the “transceiver configuration” to the “Site Default” area after Setting-To-Work (STW) and later on after major changes of the settings.

Furthermore, it is also recommended to back up the “Transceiver configuration”, log files, area masking and maps on the RST computer. When activating the backup from the RST, the FTP server will create and store a temporary backup file, which is then transmitted to the RST.

The “Temporary files” directory has a limited size, hence it is possible to delete some of these files by means of the RST.

The “Factory Default” data area contains basic settings for the transceiver, created and used at transceiver production. These data are not intended to be used on site.

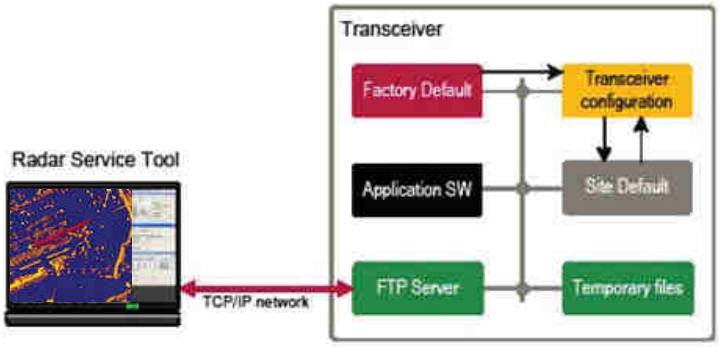


Fig. 8.5 Transceiver - SW and configuration data

8.6.1 Create/Restore backup of configuration data

Note: Antenna rotation must be stopped before initiating the backup.

To create a backup of the “transceiver configuration”, use the RST “Backup/Restore” view. See Fig. 8.6 (p. 161).

The RST saves the backup file in a directory selected by the user.

For each zipped backup file, the date is used as the file name (i.e. BackupDate.tar). The backup file contains all parameters for the transceiver and the radar system (i.e. including ACU parameters etc), logs, area masking and maps.

The restore function copies the transceiver backup file from the RST to the “transceiver configuration” area. The transceiver will restart to activate and use the restored backup file.

An option of the restore function is to restore transceiver independent parameters only. This function is useful when having several sites in which the transceiver configuration is identical. Be careful using this function as it does not fully restore the transceiver.

“Delete Temp” removes temporary files stored in the transceiver (FTP Server).

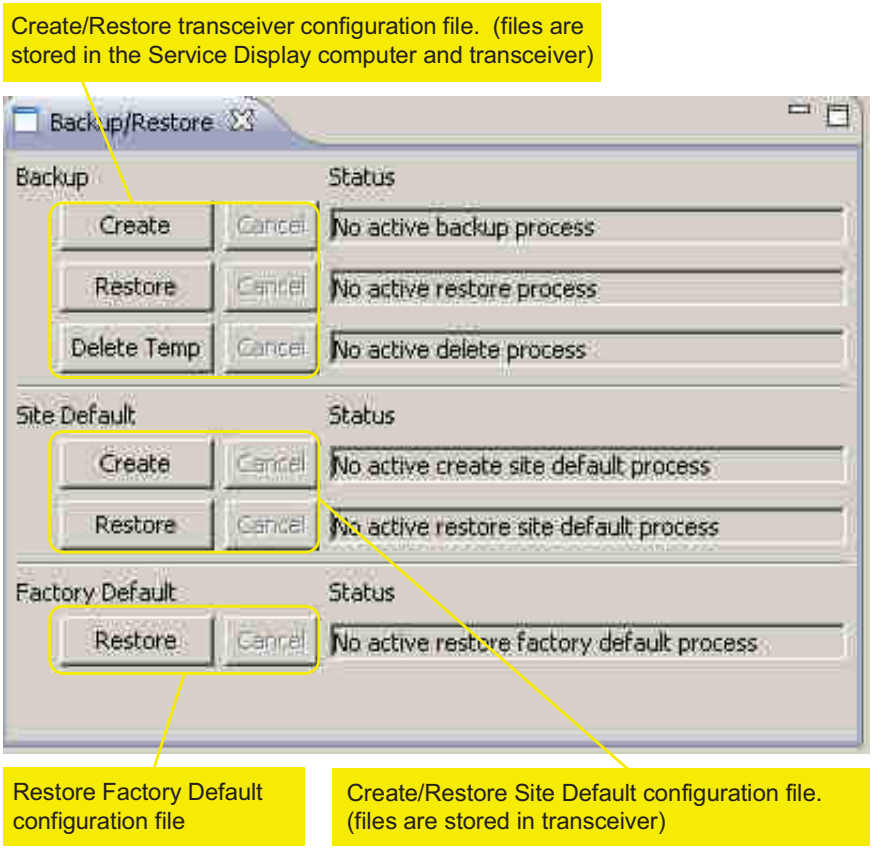


Fig. 8.6 Menu: Window / Show View / Backup/Restore

The “Site Default” create option copies the” transceiver configuration” to the “Site Default” area. Restore copies the “Site Default” to the “transceiver configuration” area. The transceiver will restart to activate and use the new data.

The “Factory Default” data contains basic parameter values for the transceiver. These are created at transceiver production and should not be used after the radar has been set up.

Recommendation: When restoring the transceiver backup, always use full restore.

Warning!

Restoring the “Factory Default” data will delete the “transceiver configuration” area. The transceiver is then out of service, unless there has been created a backup on the RST that can be restored.

8.7 Antenna correction and range adjustment

1	In the “Video Setup” view, set the RST measurement units to correspond to the available target data.
2	Set the “Antenna Correction” parameter to zero. (Configuration/Interfaces/Antenna)
3	Set “Range Adjust” parameter to zero. (Configuration/Interfaces/Antenna)
4	Locate a uniform, non-moving, small and stable target at a long range with a known range/bearing or GPS. Use the EBL/VRM tool to show the target on the VRM scope and measure the exact bearing. See Fig. 8.7 (p. 162) GPS positions can be converted to range and bearing from e.g. http://www.gpsvisualizer.com/calculators
5	Calculate and set the “Antenna Correction” parameter (bearing correction). Antenna correction = 360° – Measured bearing + Actual bearing
6	Watch the PPI and inspect correct bearing to target, fine adjust if required.
7	Measure the exact distance to the target. Calculate and set the “Range Adjust” parameter. Range adjust = Antenna range – Actual range
8	Watch the PPI and inspect correct range to target, fine adjust as required.

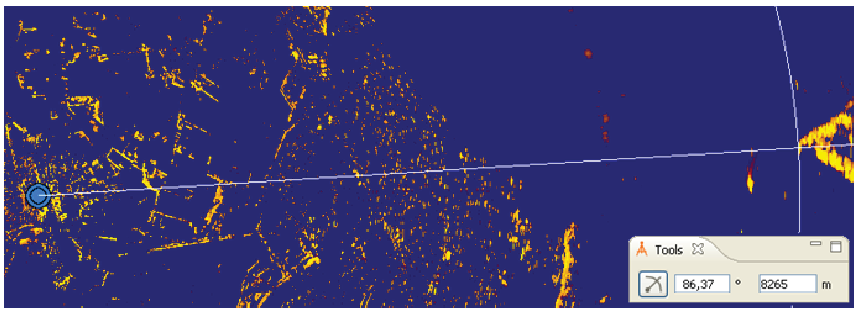


Fig. 8.7 Range and antenna correction

8.8 Antenna squint calibration

1	In the “Parameters” view, set the parameter “Burst TMFD Sequence Length” to 6. (Configuration/RxTx/Timing Calculation/Input)
2	Set the “Squint Calibration” parameter to “On”. (Service and Installation/Squint Calibration)
3	Set the ”Frequency Selection” parameter to “f0” (The first of 6 frequencies). (Service and Installation/Squint Calibration)
4	Locate a uniform, non-moving, small and stable target at a long range and use the EBL/VRM tool to show the target on the “VRM-scope” view. Zoom the scope in to cover 3-4 deg. in azimuth.
5	Place the EBL exactly on the centre of the target and then press the “Hold” icon (H) to be found inside the view, topmost right corner.
6	Set the “Squint Calibration Options” parameter to “Store data set”. (Service and Installation/Squint Calibration)
7	Set the ”Frequency Selection” parameter to the next frequency (f1 - f5). (Service and Installation/Squint Calibration)
8	Adjust the “Antenna Correction” parameter until the target max. amplitude is directly on the previously max. amplitude from step 5. Higher correction value moves target to the right in the EBL scope. See Fig. 8.8 (p. 164). (Configuration/Interfaces/Antenna/)
9	Set the “Squint Calibration Options” parameter to “Store data set”. (Service and Installation/Squint Calibration)
10	Repeat from step 7 until data sets from all 6 frequencies (f0 – f5) have been stored.
11	Set “Squint Calibration Options” parameter to “Calculate Coefficients” (if available). (Service and Installation/Squint Calibration)
12	Set “Squint Calibration” to “Off”. (Service and Installation/Squint Calibration)
13	Watch the PPI and inspect all frequencies correctly aligned.
14	Reset the “Burst TMFD Sequence Length” to previous value (default 4).

15	For redundant systems: Copy squint calibration from transceiver A to B: On transceiver B, set “Squint Calibration” to “On” Insert the “Antenna Correction Data Sets” from transceiver A
16	Set “Squint Calibration” to “Off”.

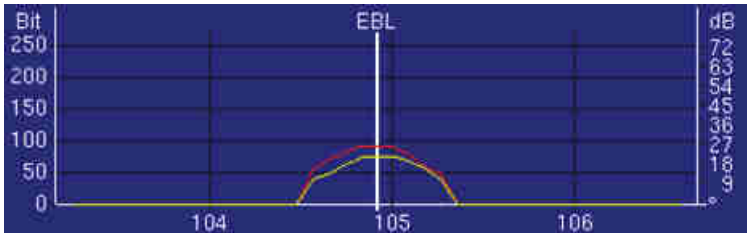


Fig. 8.8 Aligned antenna correction seen in the EBL scope of the first and second frequency, during squint calibration

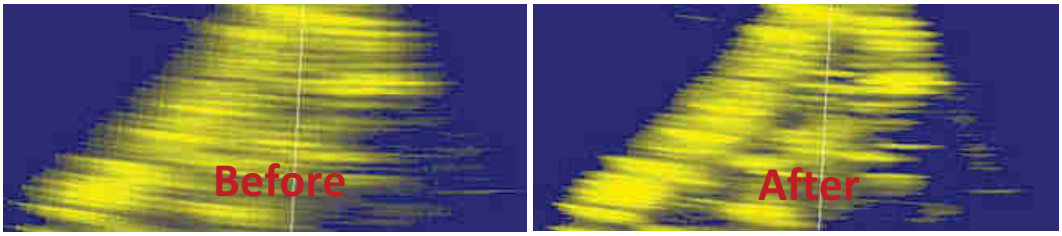


Fig. 8.9 Example of two frequencies before and after squint calibration

8.9 PSAT calibration

This procedure assumes that all profiles use the same frequency bands. If this is not the case, then each profile should be PSAT calibrated separately.

The purpose of this calibration is to avoid amplifier saturation while achieving highest output power possible.

This procedure must be carried out after replacing the SSPA, the RxTx Controller or the RxTx. A “PSAT not calibrated” message is displayed in the RST “Errors/Warnings” view.

Once the PSAT calibration is started, all Carrier Frequency Scale Factors are set to 0%. The transceiver will then adjust all carriers automatically one by one. This might take a few minutes. When calibration is completed, the error message “PSAT not calibrated” disappears from the RST “Errors/Warnings” view.

The scale factors are normally used for all 16 transceiver profiles. However, the transceiver SW is flexible and allows for different settings in the profiles.

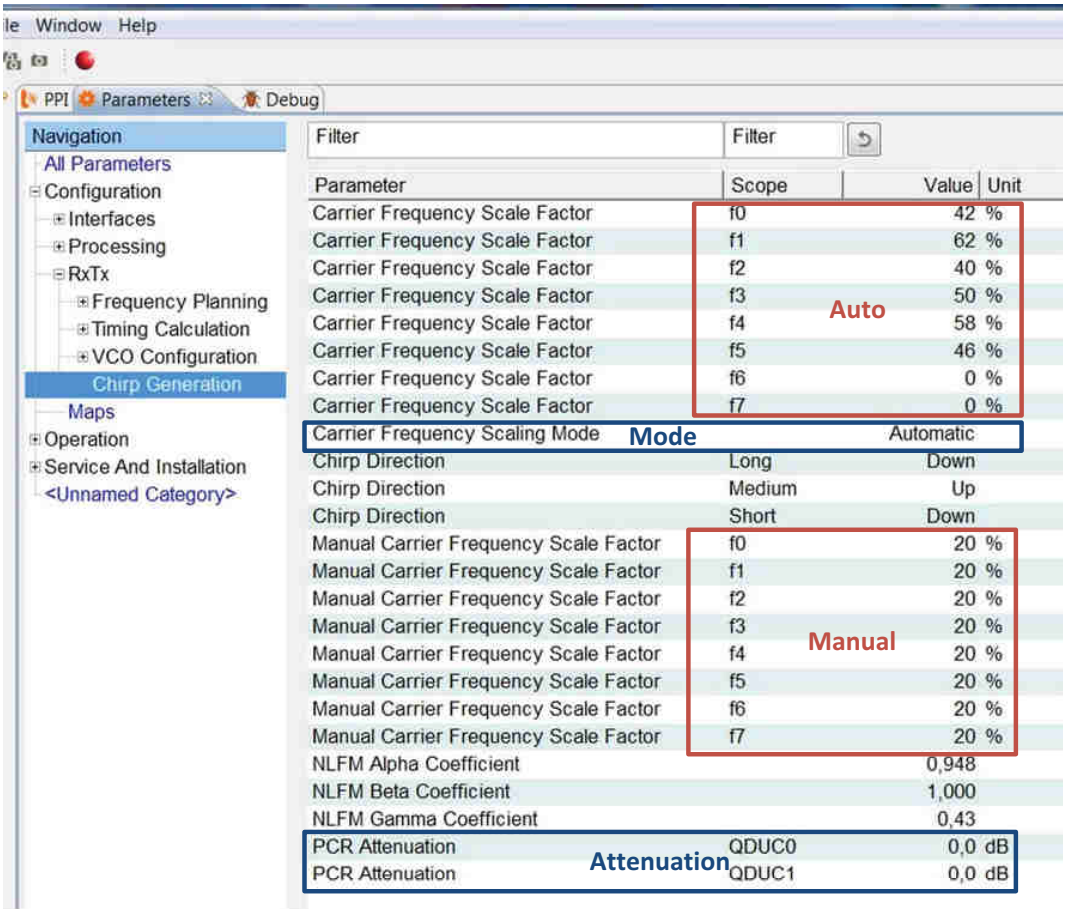


Fig. 8.10 Chirp generation

When the calibration is completed, check the “Forward Power” BITE measurement. This must be within -1 dB/+2 dB (~ -20%/+60%) of the nominal specified power. In some cases, the output power is too high and might cause an SSPA current error message. In such cases, the manual scale factors can be used or the PCR attenuation level to reduce power level and current for the SSPA.

The “Carrier Frequency Scaling Mode” parameter determines whether auto or manual scale factors are used by the SSPA.

1	In the “Low Level” perspective, open the “Profile Editor” view. Find the “Carrier Frequency Scale Factor” parameters and make sure that none of the scale factors are checked as “profiled”. (Configuration/RxTx/Chirp Generation)
2	In the “Low Level” perspective, open the “Parameters” view. Find the “Carrier Frequency Scaling Mode” parameter and set the value to “Automatic”. (Configuration/RxTx/Chirp Generation)

3	In the “Parameters” view, start the PSAT calibration by setting “PSAT Calibration” parameter to “on”. Antenna and transmission must be activated. (Service And Installation/PSAT Calibration) The calibration process will take a few minutes. The progress of the calibration can be viewed in “Chirp Generation” in the “Parameters” view. (Configuration/RxTx/Chirp Generation)
4	In the “Low Level” perspective, open the “Errors/Warnings” view and verify that the message “PSAT not Calibrated” has disappeared. Also verify that there is no SSPA current error message.
5	In the “Low Level” perspective, open the “Status/Measurements” view and read the forward power value. It must be within -1 dB/+2 dB (~ -20%/+60%) of the specified power. (Operation/BITE/Forward And Reverse Power)
6	To get rid of any SSPA current errors, use the “PCR Attenuation” parameter to attenuate the power for all carrier frequencies. Increase the attenuation in steps of 2 dB until the current error message disappears. In the “Low Level” perspective, open the “Parameters” view. Use the “PCR Attenuation” parameter. (QDUC1) is for SMR systems (Low Band frequency) (Configuration/RxTx/Chirp Generation)

9 BITE errors and warnings

The following lists BITE errors and warnings that may be detected in the system. Please note that the list is not exhaustive. For a complete list of errors and warnings, please refer to doc. 386303-DI “SCANTER 5000 Series Transceiver Control Protocol Data Definition - Service Access Mode”.

Name	Min	Max	Severity	Description
ACP Polarity#EXTIO			Error	
ACP Polarity#RXTX			Error	
ACU Fault			Redundant System Critical Error	Indicates that the safety loop has been opened by the ACU. Antenna rotation and transmission will cease.
Antenna Pattern File Error			Error	The transceiver was unable to read the antenna pattern file or file format was not correct
Antenna Rotation Tellback Error			Redundant System Critical Error	Indicates that no antenna rotation tellback is received although the antenna is expected to be rotating
Antenna Speed Not Calibrated	0	0	Error	Indicates that antenna speed is not calibrated
ARP Polarity#EXTIO			Error	
ARP Polarity#RXTX			Error	
Asterix Database Overload Error	4095	4096	Error	The Asterix database is full. New messages will be discarded
Asterix Database Overload Warning	3996	4096	Warning	The Asterix database is approaching its max capacity of 4096 messages.
Azimuth Out Of Range#EXTIO			Error	
Azimuth Out Of Range#RXTX			Error	
BITE Measurement Log Disk Limit Reached			Error	Indicates that the amount of disk space allocated to the BITE Measurement Log has been used up
BITE Status Log Disk Limit Reached			Error	Indicates that the amount of disk space allocat-

Name	Min	Max	Severity	Description
				ed to the BITE Status Log has been used up
BITE Warning and Error Log Disk Limit Reached			Error	Indicates that the amount of disk space allocated to the BITE Warning and Error Log has been used up
Blanking Map Status			Error	Indicates that the blanking map is missing
Board Temperature Error#External IO	85.0	500.0	Fatal Error	Indicates that the board surface temperature is outside the recommended temperature range and that Mains has been turned off to prevent component damage
Board Temperature Error#Motherboard	85.0	500.0	Fatal Error	Indicates that the board surface temperature is outside the recommended temperature range and that Mains has been turned off to prevent component damage
Board Temperature Error#PSU	85.0	500.0	Fatal Error	Indicates that the board surface temperature is outside the recommended temperature range and that Mains has been turned off to prevent component damage
Board Temperature Error#RxTx	85.0	500.0	Fatal Error	Indicates that the board surface temperature is outside the recommended temperature range and that Mains has been turned off to prevent component damage
Board Temperature Error#RxTx Ctrl	85.0	500.0	Fatal Error	Indicates that the board surface temperature is outside the recommended temperature range and that Mains has been turned off to prevent component damage
Board Temperature Error#SSPA Ctrl	85.0	500.0	Fatal Error	
Board Temperature Error#SSPA PA1	85.0	500.0	Fatal Error	
Board Temperature Error#SSPA PA2	85.0	500.0	Fatal Error	
Board Temperature Error#SSPA PA3	85.0	500.0	Fatal Error	
Board Temperature Error#SSPA PA4	85.0	500.0	Fatal Error	
Board Temperature Error#SSPA PSU	85.0	500.0	Fatal Error	Indicates that the board surface temperature is outside the recommended temperature range and that Mains has been turned off to prevent component damage
Board Temperature Warning#External IO	75.0	85.0	Warning	Indicates that the board surface temperature is outside the recommended temperature range
Board Temperature Warning#Motherboard	75.0	85.0	Warning	Indicates that the board surface temperature is outside the recommended temperature range
Board Temperature Warning#PSU	75.0	85.0	Warning	Indicates that the board surface temperature is

Name	Min	Max	Severity	Description
				outside the recommended temperature range
Board Temperature Warning#RxTx	75.0	85.0	Warning	Indicates that the board surface temperature is outside the recommended temperature range
Board Temperature Warning#RxTx Ctrl	75.0	85.0	Warning	Indicates that the board surface temperature is outside the recommended temperature range
Board Temperature Warning#SSPA Ctrl	75.0	85.0	Warning	
Board Temperature Warning#SSPA PA1	75.0	85.0	Warning	
Board Temperature Warning#SSPA PA2	75.0	85.0	Warning	
Board Temperature Warning#SSPA PA3	75.0	85.0	Warning	
Board Temperature Warning#SSPA PA4	75.0	85.0	Warning	
Board Temperature Warning#SSPA PSU	75.0	85.0	Warning	Indicates that the board surface temperature is outside the recommended temperature range
Burst TMFD Configuration Error			Error	Configuration of the Burst TMFD timing sequence contains errors and therefore the requested timing scenario isn't being realized.
Chirp Reference Level Low Error#f0			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than expected.
Chirp Reference Level Low Error#f1			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than expected.
Chirp Reference Level Low Error#f2			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than expected.
Chirp Reference Level Low Error#f3			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than expected.
Chirp Reference Level Low Error#f4			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than expected.
Chirp Reference Level Low Error#f5			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than expected.
Chirp Reference Level Low Error#f6			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than expected.
Chirp Reference Level Low Error#f7			Error	Indicates that the power of the transmitted signal as seen by the receiver is lower than

Name	Min	Max	Severity	Description
Communication Error#Slot 6#VCC1V0 2			Error	Indicates that an error was encountered when trying to communicate with the specified POL
Communication Error#Slot 6#VCC1V8 1			Error	Indicates that an error was encountered when trying to communicate with the specified POL
Communication Error#Slot 6#VCC1V8 2			Error	Indicates that an error was encountered when trying to communicate with the specified POL
Communication IOExpander PhaseShifter Setup Error#SSPA I2C			Error	
Communication IOExpander Setup Error#SSPA I2C			Error	
Communication Temperature Error#SSPA I2C			Error	
Communication Temperature Setup Error#SSPA I2C			Error	
Communication Voltage Error#External IO			Error	
Communication Voltage Error#SSPA I2C			Error	
Communication Voltage Setup Error#External IO			Error	
Communication Voltage Setup Error#PSU I2C 1			Error	Indicates that a communication error occurred while trying to setup the 1st voltage measurement circuit of the PSU
Communication Voltage Setup Error#PSU I2C 2			Error	Indicates that a communication error occurred while trying to setup the 2nd voltage measurement circuit of the PSU
Communication Voltage Setup Error#SSPA I2C			Error	
Control Link Down#CFAR Control#Surface#Area			Redundant System Critical Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#ClutterMap			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#CoreTracker			Error	Indicates that the communication between the main software node and the software node

Name	Min	Max	Severity	Description
Control Link Down#ET2			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#MainsOn			Redundant System Critical Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#NTPWatch#ET2			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#PEX#Surface			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#PlotCombiner			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#PlotPublisher			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#SCD Control#Surface			Redundant System Critical Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#SDH			Redundant System Critical Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#SensorCorrelator			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#TrackPublisher			Error	Indicates that the communication between the main software node and the software node specified is not established
Control Link Down#Transceiver Monitor			Redundant System Critical Error	Indicates that the communication between the main software node and the software node specified is not established
Controller Revision Error#External IO#VCC3V3			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#External IO#VCC2V5			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#External IO#VCC1V5			Error	Indicates that the revision of the specified POL was not recognized

Name	Min	Max	Severity	Description
Controller Revision Error#Slot 5#VCC1V02			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#Slot 5#VCC1V81			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#Slot 5#VCC1V82			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#Slot 6#VCC1V01			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#Slot 6#VCC1V02			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#Slot 6#VCC1V81			Error	Indicates that the revision of the specified POL was not recognized
Controller Revision Error#Slot 6#VCC1V82			Error	Indicates that the revision of the specified POL was not recognized
Core Tracker Input Link			Error	Could not connect to data input source.
CP4 Board Not Present Error#Slot 2			Redundant System Critical Error	Indicates that a required CP4 Board is not present
CP4 Board Not Present Error#Slot 3			Redundant System Critical Error	Indicates that a required CP4 Board is not present
CP4 Board Not Present Error#Slot 4			Redundant System Critical Error	Indicates that a required CP4 Board is not present
CP4 Board Not Present Error#Slot 5			Redundant System Critical Error	Indicates that a required CP4 Board is not present
CP4 Board Not Present Error#Slot 6			Redundant System Critical Error	Indicates that a required CP4 Board is not present
CPU Load Error#HousekeepingPC	151	100000	Error	Indicates that the CPU is heavily overloaded
CPU Load Error#TrackerPC	151	100000	Error	Indicates that the CPU is heavily overloaded
CPU Load Warning#HousekeepingPC	126	150	Warning	Indicates that the CPU is slightly overloaded
CPU Load Warning#TrackerPC	126	150	Warning	Indicates that the CPU is slightly overloaded

Name	Min	Max	Severity	Description
Fan A Speed Error#Fan Controller	0	500	Error	Indicates that the transceiver fan speed tellback is outside the expected range
Fan A Speed Warning#Fan Controller	500	1000	Warning	Indicates that the transceiver fan speed tellback is outside the expected range
Fan Differential Pressure Error#Fan Controller	535.0	822.7	Error	Indicates that the latest valid reading of the transceiver fan differential pressure sensor is outside the allowed range
Fan Differential Pressure Warning#Fan Controller	490.0	535.0	Warning	Indicates that the latest valid reading of the transceiver fan differential pressure sensor is outside the recommended range
FFT Bandwidth Exceeded Error			Error	Indicates that the configured timing scenario exceeds the signal processing capabilities of the transceiver and that delays have been introduced to compensate for this (resulting in a lower duty cycle and PRF than could otherwise be expected)
Firmware Initialization Error#MainsOn			Redundant System Critical Error	Set when the application was unable to establish access to a firmware board.
Firmware Initialization Error#NodeManagerCentral			Redundant System Critical Error	Set when the application was unable to establish access to a firmware board.
Firmware Module Not Present Error#MainsOn			Redundant System Critical Error	Set when the application was unable to establish access to a firmware module.
Firmware Module Not Present Error#NodeManagerCentral			Redundant System Critical Error	Set when the application was unable to establish access to a firmware module.
Forward Power Calibration Table Invalid Error#RxTx Ctrl			Error	Indicates an error occurred while reading RxTx Controller calibration data from the PC hard disk
Forward Power Calibration Table Invalid Error#SSPA			Error	Indicates an error occurred while reading SSPA calibration data from the PC hard disk
Forward Power Calibration Table Used Not Verified Warning#RxTx Ctrl			Warning	Indicates a testing RxTx Controller table is used
Forward Power Calibration Table Used Not Verified Warning#SSPA			Warning	Indicates a testing SSPA calibration table is used
Forward Power Low			Warning	Indicates when currently transmitted power is lower than warning level but higher than speci-

Name	Min	Max	Severity	Description
				fied Forward Power Threshold parameter
Forward Power Too Low			Redundant System Critical Error	Indicates when currently transmitted power is lower than specified Forward Power Threshold parameter
FPGA Firmware Mismatch Error			Error	Indicates that the version of the firmware loaded into one or more of the transceiver FPGAs does not match the version expected by the transceiver application software
FPGA Temperature Error#External IO	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#RxTx Ctrl	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 2#FPGA 1	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 2#FPGA 2	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 2#FPGA 3	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 2#FPGA 4	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 3#FPGA 1	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 3#FPGA 2	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 3#FPGA 3	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 3#FPGA 4	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage
FPGA Temperature Error#Slot 4#FPGA 1	90	500	Fatal Error	Indicates that the FPGA core temperature is outside the allowed range and that Mains has been turned off to prevent component damage

Name	Min	Max	Severity	Description
FPGA Temperature Warning#Slot 2#FPGA 3	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 2#FPGA 4	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 3#FPGA 1	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 3#FPGA 2	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 3#FPGA 3	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 3#FPGA 4	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 4#FPGA 1	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 4#FPGA 2	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 4#FPGA 3	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 4#FPGA 4	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 5#FPGA 1	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 5#FPGA 2	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 5#FPGA 3	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 5#FPGA 4	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 6#FPGA 1	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 6#FPGA 2	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 6#FPGA 3	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FPGA Temperature Warning#Slot 6#FPGA 4	85	89	Warning	Indicates that the FPGA core temperature is outside the recommended range
FTP Service Down Error			Error	Indicating that the FTP service is down

Name	Min	Max	Severity	Description
Gearbox Oil Level Low Warning	0	0	Warning	Indicates that the oil level in the antenna gear box is below the recommended level
Gearbox Temperature Warning	0	0	Warning	Indicates that the temperature inside the antenna gear box is higher than recommended
Invalid HDL PEX Input#Surface			Warning	The HDL PEX has delivered erroneous data within the last scan to the PEX.
Local Temperature Error#Fan Controller	85	127	Fatal Error	Indicates that the temperature measured by the internal temperature sensor of the Fan Controller is outside the recommended temperature range and that Mains has been turned off to prevent component damage
Local Temperature Warning#Fan Controller	75	85	Warning	Indicates that the temperature measured by the internal temperature sensor of the Fan Controller is outside the recommended temperature range
Long Chirp Length Truncated Warning			Warning	Indicates that the long chirp length resulting from the configured timing scenario exceeds the maximum chirp length allowed (160us) and that the long chirp length therefore has been truncated to 160us
Low Disk Space Error			Error	Indicates free disk space is less than 15%
Low Disk Space Warning			Warning	Indicates free disk space is between 15%-25%
LRU calibration data error#RxTx			Error	Indicates that an error occurred while accessing the LRU calibration data of the specified LRU
LRU calibration data error#SSPA			Error	Indicates that an error occurred while accessing the LRU calibration data of the specified LRU
LRU calibration data writing file error#RxTx			Error	Indicates that an error occurred while writing the LRU calibration data of the specified LRU to the Housekeeping PC harddisk
LRU calibration data writing file error#SSPA			Error	Indicates that an error occurred while writing the LRU calibration data of the specified LRU to the Housekeeping PC harddisk
LRU checksum error#Application			Error	Indicates that the checksum of the LRU information for the specified LRU is not valid. An attempt is made to parse the LRU information and make it available none the less
LRU checksum error#CP4 Slot 2			Error	Indicates that the checksum of the LRU information for the specified LRU is not valid. An attempt is made to parse the LRU information and make it available none the less
LRU checksum error#CP4 Slot 3			Error	Indicates that the checksum of the LRU information for the specified LRU is not valid. An

Name	Min	Max	Severity	Description
LRU reading eeprom error#CP4 Slot 2			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#CP4 Slot 3			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#CP4 Slot 4			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#CP4 Slot 5			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#CP4 Slot 6			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#External IO			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#Fan			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#Motherboard			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#PC Controller Board			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#PSU			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#RxTx			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#RxTx Controller			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#SSPA			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#Transceiver			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
LRU reading eeprom error#Waveguide			Error	Indicates that an error occurred reading LRU information from the LRU EEPROM
Man Aloft Switch Above Open			Redundant System Critical Error	Indicates that the safety loop is open because the Man Aloft Switch Above has been activated. Antenna rotation and transmission will cease.
Man Aloft Switch Below Open			Redundant System Critical Error	Indicates that the safety loop is open because the Man Aloft Switch Below has been activated. Antenna rotation and transmission will cease.

Name	Min	Max	Severity	Description
Missing Golden Image#CP4 Slot 6			Warning	No fallback FPGA firmware image has been installed
Missing Golden Image#External IO			Warning	No fallback FPGA firmware image has been installed
Missing Golden Image#RxTx Ctrl			Warning	No fallback FPGA firmware image has been installed
Motor Protection Open			Redundant System Critical Error	Indicates that the safety loop has been opened to prevent antenna motor damage. Antenna rotation and transmission will cease.
Motor Temperature Warning	0	0	Warning	Indicates that the temperature in the antenna motor is higher than recommended
Network Video Replication Warning#Surface			Warning	Indicates that antenna rotation speed is too high compared to the requested timing scenario, resulting in more than 10% of all sweeps being replicated to avoid gaps in the video. This in turns reduces the actual azimuth resolution of the transceiver.
No Connection To NTP Daemon			Error	Unable to establish connection to the local NTP daemon
No Connection To NTP Daemon#ET2			Error	Unable to establish connection to the local NTP daemon
No Transmission Sectors Defined Warning			Warning	Sector transmission is enabled while no transmission sectors are defined
Noise Figure Calibration Table Invalid Error#RxTx			Error	Indicates an error occurred while reading RxTx calibration data from the PC hard disk
Noise Figure Calibration Table Invalid Error#RxTx Ctrl			Error	Indicates an error occurred while reading RxTxCtrl calibration data from the PC hard disk
Noise Figure Calibration Table Used Not Verified Warning#RxTx			Warning	Indicates a testing RxTx calibration table is used
Noise Figure Calibration Table Used Not Verified Warning#RxTx Ctrl			Warning	Indicates a testing RxTxCtrl calibration table is used
Noise Figure High Error			Redundant System Critical Error	Indicates when noise figure is higher than specified Noise Figure Error Threshold parameter
Noise Figure High Warning			Warning	Indicates when noise figure is higher than specified Noise Figure Warning Threshold parameter

Name	Min	Max	Severity	Description
Only One Frequency Selected Warning			Warning	This warning indicates that Only one Frequency is selected in the Frequency Selection Parameter
Over Current Error#SSPA N8V5 OUT	3.0	20.0	Error	
Over Current Error#SSPA P8V2 1	10.0	20.0	Error	
Over Current Error#SSPA P8V2 2	10.0	20.0	Error	
Over Current Error#SSPA P8V2 3	10.0	20.0	Error	
Over Current Error#SSPA P8V2 4	10.0	20.0	Error	
Over Current Error#SSPA P6V0 OUT	1.0	20.0	Error	
Over Voltage Error#External IO 12V	13.0	100.0	Fatal Error	
Over Voltage Error#External IO VCC_ENC	9.0	100.0	Fatal Error	
Over Voltage Error#External IO VCC_SL	26.0	100.0	Fatal Error	
Over Voltage Error#External IO VCC_SW	26.0	100.0	Fatal Error	
Over Voltage Error#External IO VCC_15V	17.0	100.0	Fatal Error	
Over Voltage Error#External IO VCC_WG	30.0	100.0	Fatal Error	
Over Voltage Error#External IO VCC6V	7.0	100.0	Fatal Error	
Over Voltage Error#External IO VEE_15V	-13.0	100.0	Fatal Error	
Over Voltage Error#PSU Mains	264.0	1000.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU N7V5 1	-7.1	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU N7V5 2	-7.1	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU N7V5 I	-7.1	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU P7V5 1	7.9	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU P7V5 2	7.9	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU P7V5 I	7.9	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU SSPA AC	264.0	1000.00	Error	Indicates that the supply voltage measurement

Name	Min	Max	Severity	Description
				is above the expected range
Over Voltage Error#PSU 13V5	14.2	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU 24V0	25.2	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU 12V0 1	12.6	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU 12V0 2	12.6	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU 13V5 I	14.2	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#PSU 12V0 VP	12.6	100.00	Error	Indicates that the supply voltage measurement is above the expected range
Over Voltage Error#SSPA Analog 5V0	5.5	100.0	Fatal Error	
Over Voltage Error#SSPA Digital 5V0	5.5	100.0	Fatal Error	
Over Voltage Error#SSPA PSU N8V5	-8.1	100.0	Fatal Error	
Over Voltage Error#SSPA PSU P8V2	8.6	100.0	Fatal Error	
Over Voltage Error#SSPA PSU P6V0	6.3	100.0	Fatal Error	
Over Voltage Error#SSPA PSU VCC3V3	3.5	100.0	Fatal Error	
Over Voltage Error#SSPA PSU VCC5V0	5.3	100.0	Fatal Error	
Over Voltage Error#SSPA 3V3	3.8	500.0	Fatal Error	
Parameter Change Log Disk Limit Reached			Error	Indicates that the amount of disk space allocated to the Parameter Change Log has been used up
PEX Overload#Surface			Error	The number of received plots from HDL PEX is to big.
Phase Shifter Calibration Table Invalid Error#SSPA			Error	
Phase Shifter Calibration Table Used Not Verified Warning#SSPA			Warning	
Pilot Tone Attenuation file Error			Error	
Plot Publisher Input Link#ClutterMap			Error	Could not connect to surface data input source.
Plot Publisher Input Link#Surface			Error	Could not connect to surface data input source.

Name	Min	Max	Severity	Description
PlotCombiner Input Link#Surface			Error	Could not connect to data input source #Surface.
PlotCombiner Performance Decreased			Error	Input plot older than latest output plot
Profile Unsaved Warning			Warning	Indicates that changes were made to current profile that are not yet saved
PSAT Calibration Data Serial Number Mismatch Error			Error	Stored calibration data does not match the installed LRUs, rerun PSAT calibration
PSAT Calibration Failed Error			Error	PSAT calibration failed, rerun PSAT calibration for this profile
PSAT Calibration Running Warning			Warning	Indicates that a PSAT calibrating session is ongoing and that optimal transceiver performance cannot be expected
PSAT Not Calibrated Warning			Warning	Indicates that a PSAT calibration has not been completed with the current frequency planning configuration
PSU I2C Communication Error			Error	
Redundant System Configuration Error			Error	Indicates that a problem with the redundant system configuration, e.g. the network configuration or transceiver IDs, has been detected
Redundant System Degraded Warning			Warning	Indicates that the redundant system is currently not capable of handling another critical error
Redundant System Failover Disabled Warning			Warning	Indicates that automatic failover is currently not enabled for the redundant system
Redundant System Heartbeat Communication Error			Error	Indicates that no heart beat messages have been received from the other transceiver for at least 1 sec.
Reverse Power Calibration Table Invalid Error#RxTx			Error	Indicates an error occurred while reading RxTx calibration data from the PC hard disk
Reverse Power Calibration Table Invalid Error#RxTx Ctrl			Error	Indicates an error occurred while reading RxTx Controller calibration data from the PC hard disk
Reverse Power Calibration Table Used Not Verified Warning#RxTx			Warning	Indicates a testing RxTx calibration table is used
Reverse Power Calibration Table Used Not Verified Warning#RxTx Ctrl			Warning	Indicates a testing RxTx Controller table is used
Reverse Power Too High			Critical Error	Indicates when reflected power measured is lower than specified Forward Power Threshold parameter

Name	Min	Max	Severity	Description
Static STC dB to DAC file Error			Error	
Static STC Long Chirp file Error			Error	
Static STC Short Chirp file Error			Error	
STC Calibration in progress			Warning	
STC Curve Error			Error	
Supply Overcurrent Error#External IO#DPM POL 4			Fatal Error	Indicates that an overcurrent fault has been reported by the specified AUX device
Supply Overcurrent Error#External IO#DPM POL 5			Fatal Error	Indicates that an overcurrent fault has been reported by the specified AUX device
Supply Overcurrent Error#External IO#DPM POL 6			Fatal Error	Indicates that an overcurrent fault has been reported by the specified AUX device
Supply Overcurrent Error#External IO#DPM POL 7			Fatal Error	Indicates that an overcurrent fault has been reported by the specified AUX device
Supply Overcurrent Error#External IO#VCC3V3			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#External IO#VCC2V5			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#External IO#VCC1V5			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#External IO#VCC1V0			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#Motherboard#3V3			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#Motherboard#1V5			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#Motherboard#1V0			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#Motherboard#5V_Pilot			Fatal Error	Indicates that an overcurrent fault has been reported by the specified POL
Supply Overcurrent Error#RxTx Ctrl#DPM POL 4			Fatal Error	Indicates that an overcurrent fault has been reported by the specified AUX device
Supply Overcurrent Error#RxTx Ctrl#DPM POL 5			Fatal Error	Indicates that an overcurrent fault has been reported by the specified AUX device
Supply Overcurrent Error#RxTx Ctrl#DPM POL 6			Fatal Error	Indicates that an overcurrent fault has been reported by the specified AUX device

Name	Min	Max	Severity	Description
6#VCC1V0 1				reported by the specified POL
Supply Phase Voltage Error#Slot 6#VCC1V0 2			Fatal Error	Indicates that a phase voltage error has been reported by the specified POL
Supply Phase Voltage Error#Slot 6#VCC1V8 1			Fatal Error	Indicates that a phase voltage error has been reported by the specified POL
Supply Phase Voltage Error#Slot 6#VCC1V8 2			Fatal Error	Indicates that a phase voltage error has been reported by the specified POL
Supply Power Good Warning#External IO#DPM POL 4			Warning	Indicates that a power good warning has been reported by the specified AUX device
Supply Power Good Warning#External IO#DPM POL 5			Warning	Indicates that a power good warning has been reported by the specified AUX device
Supply Power Good Warning#External IO#DPM POL 6			Warning	Indicates that a power good warning has been reported by the specified AUX device
Supply Power Good Warning#External IO#DPM POL 7			Warning	Indicates that a power good warning has been reported by the specified AUX device
Supply Power Good Warning#External IO#VCC3V3			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#External IO#VCC2V5			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#External IO#VCC1V5			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#External IO#VCC1V0			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#Motherboard#3V3			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#Motherboard#1V5			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#Motherboard#1V0			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#Motherboard#5V_Pilot			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#RxTx Ctrl#DPM POL 4			Warning	Indicates that a power good warning has been reported by the specified AUX device
Supply Power Good Warning#RxTx Ctrl#DPM POL 5			Warning	Indicates that a power good warning has been reported by the specified AUX device
Supply Power Good Warning#RxTx Ctrl#DPM POL 6			Warning	Indicates that a power good warning has been reported by the specified AUX device

Name	Min	Max	Severity	Description
6#VCC1V0 1				reported by the specified POL
Supply Power Good Warning#Slot 6#VCC1V0 2			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#Slot 6#VCC1V8 1			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Power Good Warning#Slot 6#VCC1V8 2			Warning	Indicates that a power good warning has been reported by the specified POL
Supply Temperature Error#External IO#DPM POL 4			Fatal Error	Indicates that an overtemperature fault has been reported by the specified AUX device
Supply Temperature Error#External IO#DPM POL 5			Fatal Error	Indicates that an overtemperature fault has been reported by the specified AUX device
Supply Temperature Error#External IO#DPM POL 6			Fatal Error	Indicates that an overtemperature fault has been reported by the specified AUX device
Supply Temperature Error#External IO#DPM POL 7			Fatal Error	Indicates that an overtemperature fault has been reported by the specified AUX device
Supply Temperature Error#External IO#VCC3V3			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#External IO#VCC2V5			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#External IO#VCC1V5			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#External IO#VCC1V0			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#Motherboard#3V3			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#Motherboard#1V5			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#Motherboard#1V0			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#Motherboard#5V_Pilot			Fatal Error	Indicates that an overtemperature fault has been reported by the specified POL
Supply Temperature Error#RxTx Ctrl#DPM POL 4			Fatal Error	Indicates that an overtemperature fault has been reported by the specified AUX device
Supply Temperature Error#RxTx Ctrl#DPM POL 5			Fatal Error	Indicates that an overtemperature fault has been reported by the specified AUX device
Supply Temperature Error#RxTx Ctrl#DPM POL 6			Fatal Error	Indicates that an overtemperature fault has been reported by the specified AUX device

Name	Min	Max	Severity	Description
6#VCC1V0 1				reported by the specified POL
Supply Undervoltage Error#Slot 6#VCC1V0 2			Fatal Error	Indicates that an undervoltage fault has been reported by the specified POL
Supply Undervoltage Error#Slot 6#VCC1V8 1			Fatal Error	Indicates that an undervoltage fault has been reported by the specified POL
Supply Undervoltage Error#Slot 6#VCC1V8 2			Fatal Error	Indicates that an undervoltage fault has been reported by the specified POL
Synthetic Encoder Data Enabled Warning			Warning	Indicates that synthetic encoder data generation is active (i.e. the Synthetic Encoder Data parameter has been set to 'Enable')
Time Not Synchronized			Warning	Time has not (yet) been synchronized with the time server
Time Not Synchronized#ET2			Warning	Time has not (yet) been synchronized with the time server
Time Root Dispersion Limit Exceeded			Warning	Time between local time and time server is too great
Time Root Dispersion Limit Exceeded#ET2			Warning	Time between local time and time server is too great
Track Drop Threshold Auto Overload Error	0.0	100	Error	The tracker overloaded.
Track Drop Threshold Auto Overload Warning	-10.0	0	Warning	The tracker is approaching overload. MHT is disabled.
Track Publisher Input Link			Error	Could not connect to data input source.
Track Publisher SSC Input Link			Error	Could not connect to Secondary Sensor Correlator data input source.
Transceiver Configuration Default Restore Failed			Error	Failed to restore configuration from backup
Transceiver Configuration Restore Error			Error	Indicates that a restore operation has failed
Transceiver Configuration Restore Failed			Error	Failed to restore configuration from backup
Transceiver Software Rollback Failed			Error	Indicates that a software upgrade was rolledback but this process failed!
Transceiver Software Upgrade Failed			Error	Indicates that the requested software upgrade/downgrade request have failed! we are still running old software revision
TX Inhibit Active	0	0	Warning	Indicates that the TX Inhibit signal in connector X15 has been activated by an external system
Under Current Error#SSPA N8V5 OUT	-10.0	-1.0	Fatal Error	

Name	Min	Max	Severity	Description
Under Voltage Error#PSU 24V0	-100.0	22.8	Error	Indicates that the supply voltage measurement is below the expected range
Under Voltage Error#PSU 12V0 1	-100.0	11.4	Error	Indicates that the supply voltage measurement is below the expected range
Under Voltage Error#PSU 12V0 2	-100.0	11.4	Error	Indicates that the supply voltage measurement is below the expected range
Under Voltage Error#PSU 13V5 I	-100.0	12.8	Error	Indicates that the supply voltage measurement is below the expected range
Under Voltage Error#PSU 12V0 VP	-100.0	11.4	Error	Indicates that the supply voltage measurement is below the expected range
Under Voltage Error#SSPA Analog 5V0	-100.0	4.5	Fatal Error	
Under Voltage Error#SSPA Digital 5V0	-100.0	4.5	Fatal Error	
Under Voltage Error#SSPA PSU N8V5	-100.0	-8.9	Fatal Error	
Under Voltage Error#SSPA PSU P8V2	-100.0	7.8	Fatal Error	
Under Voltage Error#SSPA PSU P6V0	-100.0	5.7	Fatal Error	
Under Voltage Error#SSPA PSU VCC3V3	-100.0	3.1	Fatal Error	
Under Voltage Error#SSPA PSU VCC5V0	-100.0	4.7	Fatal Error	
Under Voltage Error#SSPA 3V3	-100.0	2.8	Fatal Error	
Video Server Link Error#Surface	0	1	Error	Indicates that the communication between the main software node and the video server is not established
Waveguide Not Available Error			Critical Error	Indicates that the waveguide switch tellback reports that a waveguide switch is connected and in the position where this transceiver does not have access to the waveguide, even though the Redundant System Mode parameter is set to Single
Waveguide Switch 2 error			Error	Indicates that waveguide switch is out of sync
Waveguide Switch Tellback Error			Error	Indicates that the waveguide switch tellback was unexpected, i.e. the tellback was invalid or the waveguide switch position did not match the requested position

10 List of installation documents

This chapter includes a reference list for documents needed for installation of and communication with the transceiver.

Doc. number	Contents
386305-ZD	Installation drawing, transceiver
337318-EB	Block schematics and interconnections
650000-ZC	Installation cabling (wire list)
659000-ZD	SCANTER ACU Dimensions, Installation drawing
659000-EC	SCANTER ACU, Schematic
386300-DI	SCANTER 5000/6000 Series Transceiver Interface specification
502074-DI	Transceiver Interface Control
264122-DI	Transceiver Control Interface
705502-ZD	Redundant 5000 Series, Installation drawing
705502-PD	Redundant 5000 Series, Product Specification

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11 Annex A - Acknowledgement

The SCANTER 5000/6000 Series transceiver software package contains open source software components. License information can be found in doc. no. 386302-RA: “SCANTER 5000/6000 Series Transceiver Core Software Open Source Components License Information”, while the source code for these components is available in doc. no. 386302-SC: “SCANTER 5000/6000 Series Transceiver Core Software GPL Source Code”.

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