

Klein 3000 Side Scan Sonar Telemetry Faults

Although the Klein 3000 Side Scan Sonar is an extremely reliable system, because it is used in a physically demanding environment occasional problems do arise. The most common problem encountered by any Side Scan Sonar system is the telemetry fault. This would be the communication via coaxial connections between the TPU and the Towfish. There are different causes and different degrees of severity of a telemetry fault. The following troubleshooting steps are recommended for the Klein 3000 Side Scan Sonar in order of complexity beginning with the most basic fault.

The symptom of a telemetry fault is, with the TPU connected to the Towfish via the deck cable, winch slip ring and tow cable and with the **computer and TPU properly configured**, the towfish will not come up. The indication is the two yellow LED's on the Demultiplexer PCB stay illuminated after the normal boot time (approximately one minute). This indicates failure of the data communication between the TPU and Towfish. If this should happen, de-energize the TPU and follow the below steps in order:

- 1) Although the Klein 3000 Side Scan Sonar is a complex electronic device, the telemetry connection between the Towfish Type N Connector on the TPU and the 8 pin connector on the Towfish bulkhead is a simple single conductor with shield 50 ohm coaxial cable connection. Check all of the connections between the TPU and the Towfish confirming that they are properly seated. Check the entire length of the cable for damage.
- 2) If all of the connections are secured, using a DVM measure the DC Voltage (approximately 200 VDC) at the following points:
 - a. The Type N Connector on the back of the TPU. Carefully measure across the center pin and the outside shell. If the 200 VDC is not present, remove the Towfish Fuse on the back of the TPU and replace it if necessary. This may correct your problem.

Note:

If you measure the 200 VDC at an excessive value such as 275 VDC and the voltage switch on the back panel of the TPU is set properly for 115 VAC or 220 VAC depending on your voltage source, contact Klein for technical support. Do not run the equipment if the voltage is more than 10% above normal operational voltage of 200 VDC. This symptom indicates a possible failure of the TPU 200 VDC Power Supply.

**Type N
Connector
Center Pin**



- b. If the 200 VDC is present on the Type N Connector, reconnect to the Type N Connector and continue checking for the 200 VDC. Confirm that it is present at the end of the tow cable or the deck cable (depending on configuration). If using a winch, confirm that the 200 VDC is present at the input to the slip ring and at the end of the winch tow cable. The final check should be at the input to the Towfish.

Note:

The faults described below in relation to R11 on the TPU 200 VDC Power Supply PCB (**R10 on newer Universal Power Supply PCB's, Klein PN 14103210**) and R30 on the Towfish Multiplexer PCB are normally caused when the tow cable breaks with the TPU energized or could be caused if the tow cable is disconnected with the TPU energized. If proper care is taken to shut down the system completely before disconnecting the tow cable at any point in its run between the Type N Connector on the TPU and the bulkhead connector on the Towfish, the occurrence of this fault should be minimized. Whenever the TPU is energized and connected to the Towfish, the Towfish is energized.

- 3) Assuming that the 200 VDC is present at the input to the Towfish, **that the Computer and the TPU are properly configured** and the Cable

BNC is connected to the front of the Demultiplexer PCB, the following steps can be taken, **assuming a degree of technical competency:**

- a. Removing the two screws that hold the locking bar on the rear of the TPU, slide the locking bar back to remove the top cover from the TPU exposing the TPU Power Supplies and the 200 Volt Transformer.



R11

- b. On the TPU Power Supply PCB, Klein Part Number 14102048, measure R11, Klein Part Number 12100547 with a DVM. It should read 4.7 ohms. If it reads open or a high value resistance, it should be replaced. Use a resistor supplied by Klein or an equivalent 4.7 ohm, **1 watt** resistor of proper physical size.
- c. If you replace R11 the PCB should be removed. **Use extreme caution in removing this PCB. Mark all connectors and be careful to reconnect them to the proper place when the PCB is reinstalled.**

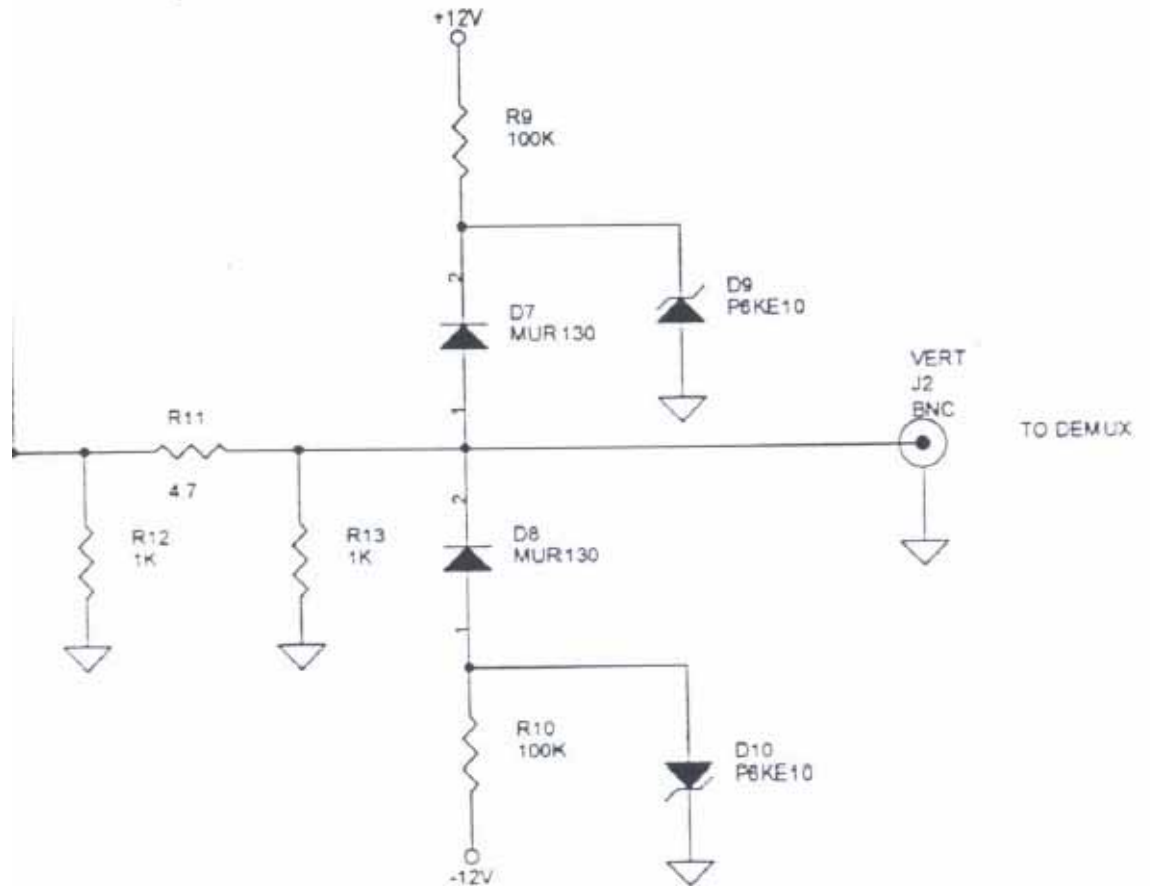
Note:

*On newer Universal Power Supplies, measure R10.
See the note at the end of this document for
information on R10.*



R11

- d. If after replacing R11, the Towfish boots up, however you observe deteriorated performance, it is possible some other components may have been damaged.
- e. Using the below partial schematic of the TPU 200 VDC Power Supply PCB as a reference, replace D7, D8, D9 and D10. Also ohm out R9 and R10 to confirm proper value. Replace R9 and/or R10 if the value is not correct.

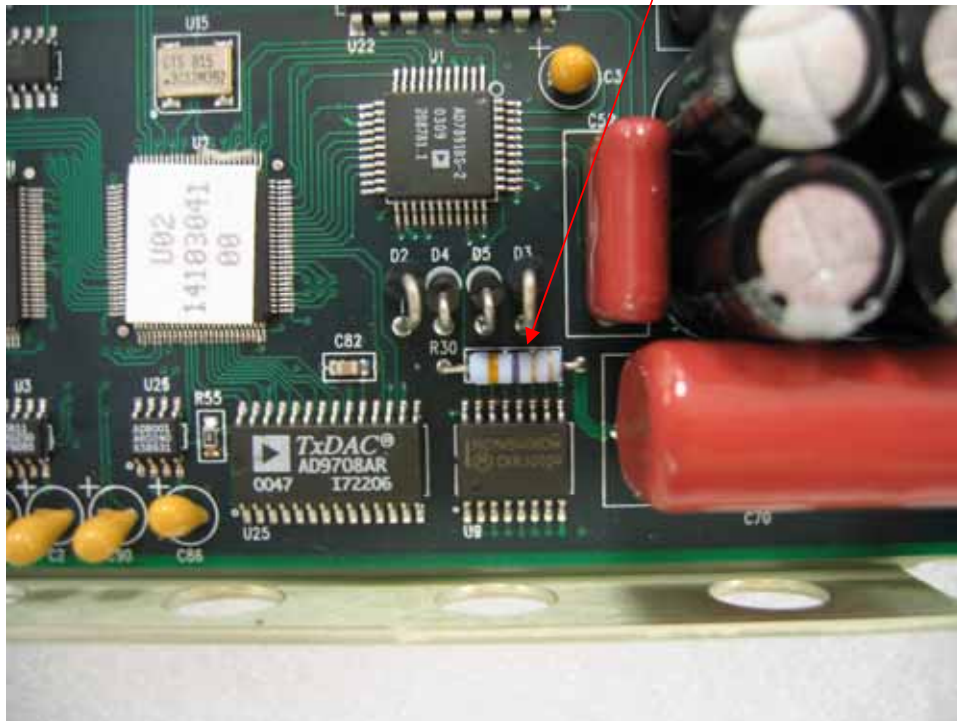


- f. D7 and D8 are Klein Part Number 12000113
D9 and D10 are Klein Part Number 12000100
R9 and R10 are Klein Part Number 12100006.
- 4) If R11 on the TPU 200 VDC Power Supply PCB is the correct value and again assuming that the 200 VDC is present at the Towfish and the Computer and TPU are properly configured, the following steps can be taken.
- a. Referring to Section 4.22 on page 4-38 of the 3000 Troubleshooting Guide for instructions on removing the electronics package from the Towfish. If you haven't already done so, after removing the Nose Cone from the Towfish, disconnect the Towfish Jumper Cable on the Bulkhead and check for 200 VDC across pins 1 (200 VDC) and 2 (Return) using a DVM. **If the 200 VDC is not present, replace the 39 inch Towfish Jumper Cable.** If it is present continue to b.
 - b. After removing the electronics package, find R30 on the Multiplexer PCB, Klein Part Number 14102051. R30, Klein Part Number

12100547, should measure 4.7 ohms and is a **1 watt** resistor. If it is open or a significantly higher value, replace it.



R30



Note:
On the newer Universal Power Supply, Klein PN 14103210, R10 should measure 4.7 ohms, 1 watt. See the partial schematic and photo below for reference.

