

## Appendix 8. Troubleshooting the Meter

In cases where you meet troubles in getting the meter working correctly you may need assistance. Visilab is able to help you but to alleviate our burden, please check the following points before calling us.

### **A. Symptom: No moisture signal to the PC data collection system, no contact in either packet protocol mode nor in keyboard mode with the IRMA7Basic program.**

1. Is the meter correctly powered? Are you sure? Is there some light coming out of the bottom of the meter? If yes, the meter is receiving power. If not, check the power cable from the distribution box. It should be connected to a 230VAC or 110VAC wall inlet.
2. Is the thick RS232 cable with the black round 8-pin connector placed into the correct socket in the meter's panel? It should be at the lowest position as labeled. The upper socket is for the Profibus DP connector. If there is still no power to the meter, the distribution boxes power source may be faulty (rare). Let a technician check it or contact Visilab. A voltage close to +12 Volts should be available in it between connector pins 1 and 8 as shown in Appendix 5. The power source contains also a standard fuse which can be replaced. All other fuses in the whole system are self-recovering and need no service.
3. Is the RS232 cable correctly plugged at both ends? Has it been damaged? If yes, fix it.
4. Are you sure that the COM port you are using in IRMA7Basic program is actually the one you have connected the cable into? **This is absolutely the most frequent reason for communication problems with the meter.** Change the port selection in the IRMA7Basic program's Configuration page.
5. If done all right thus far and still no connection is established with the meter, go to the keyboard mode. Return back to packet protocol mode again. Repeat this once more. Still no connection? Try the Meter Status page and the Check status button. Still no connection? Turn the power off of the PC and try again. The COM port may be jammed for some reason. Especially, the old PC's are sensitive to static electricity and other electrical and operating system software errors. If this does not help, either your PC does not support any available COM port or the connector you are trying is not the correct one. Also, the COM port may be damaged. Also, the COM port may be reserved by some other Windows application. Release the port from that application or deactivate the application altogether if that is the only way to do it. The interfering application might be some web browser or modem communications program.
6. One source of confusion may arise if the high-speed serial communication is in use, either in the software or in the meter, but not in both.

### **B. Symptom: No moisture signal to the Profibus DP data collection system, the Master is not able to find the slave**

1. Is the meter correctly powered? Are you sure? Is there some light coming out of the bottom of the meter? If yes, the meter is receiving power. If not, check the power cable from the distribution box. It should be connected to a 230VAC or 110VAC wall inlet.
2. Is the thick Profibus DP cable with the black round 8-pin connector placed into the correct socket in the meter's panel? It should be at the upper position as labeled. The lower socket is for the RS232 connector. If there is still no power to the meter, the distribution boxes power source may be faulty (rare). Let a technician check it or contact Visilab. A voltage close to +12 Volts should be available in it at the connector pins shown in Appendix 5.
3. Is the DP cable correctly plugged in at both ends to the fieldbus? Has it been damaged? If yes, fix it.

4. Are the two wires in the DP connector correctly positioned? Try swapping them at one connector, not both. If not successful, reswap the wires.
5. If done all right thus far and still no connection is established with the meter try the PC. Does the PC connection to the meter with the RS232 work all right? **If yes, this is most likely a configuration problem of the Profibus DP (master or slave) or a cabling problem. The configuration problems are the most frequent with Profibus DP malfunction causes.**
6. Are you sure of the slave address set for the meter? It is usually 3. If the Master tries to discuss with a different slave number, it is not able to establish a connection.
7. Check the ID of the meter in the Profibus menu (keyboard mode). Check also the slave address. Change if necessary. Check if the DP is active. If not, activate and initialize the DP part of the meter.
8. Disconnect the fieldbus connector at either end. Go into the keyboard mode, go to the Profibus menu and initialize the meter's DP part by pressing '5'. Press '9' for looping and watch the messages when the fieldbus connector is plugged in. Some of them are indicative of the problem. The first message is "Baud" which means that there is a physical connection (at the RS485 level) and the system has identified the correct baud rate. Then, other messages may appear like, "prm", "cfg", "DEX" and "Tout". The "prm" means that the basic parametrization of the slave matches with the assumption of the Master. "cfg" means that the same applies for the slave I/O configuration data. "DEX" means that full acceptance is received from the Master. "Tout" means that there is a timeout event preventing connection at some stage of the accepting process. Other messages need diagnostic knowledge and we are not handling them here. However, you are able to determine the possible problem from this alone. Stop looping by pressing the ESC key. Reinitialize with '5' and return to the packet protocol mode.
9. Check all items again referring to the DP slave configuration and check the cables. Are you using the correct GSD file for this slave?

**C. Symptom: No moisture signal from the voltage output but the PC program and Profibus DP work all right and moisture readings are correct.**

1. Check the cables for proper connection
2. Check the voltage output connector (BNC) at the distribution box. Does it look damaged? Is there water or dirt on it? Is the cable going out of the BNC shorted?
3. Check to see if the meter is in Low Power mode instead of Normal mode. Turn it into Normal mode if true.
4. If the points above are OK, the voltage output line's protection resistor may be damaged. It is located inside the distribution box near the BNC connector. If it looks burnt and its resistance value (usually 120 to 1000 Ohms) is not correct (broken?), the resistor needs to be replaced. The cause for this is that someone has plugged in some external voltage into this connector causing damage to the protection. The worst case is, that the DAC which actually generates the voltage on the SA-LOON board is damaged too(rare). Check the voltage scaling in the calibration menu in keyboard mode. If the DAC is damaged, it has to be replaced at Visilab.

**D. Symptom: The moisture signal is incorrect.**

1. Are you using the proper calibration table for it?
2. Have you made adjustments to the table used (with Adjust)? Could that explain this? Check the amount of adjustment in the keyboard mode menu system, Calibration and Adjust.
3. Is the meter's position different from normal assembly? The web could be seen differently if it is

curved or in a quite different angle or distance compared to the original position. Then, do the Adjust to correct it. No mechanical adjusting is required. If it is easy to do the mechanical adjusting, try it first.

4. Is the web thermometer showing correct readings? Is the small window of the thermometer clogged with dirt? If not, (readings like 0 C or 500C are abnormal) the compensation of the thermometer pulls the moisture signal. The only remedy is to replace the thermometer. As a first aid, the faulty thermometer could be disabled (contract Visilab for details) to stop the interference.

5. Is the head temperature too high? It should normally be below +45C. Has the meter been subject to very high ambient temperatures? If you are using air flow, are you sure the flow has been continuous without any breaks? If the temperature has risen too much, irreversible damage (or at least changes to some important parameters) have been caused to the meter. In mild cases there is no serious damage but the meter has gained some extra offset to its moisture signals. In severe cases the optical head is damaged and must be replaced and readjusted.

**E. Symptom: It seems that the electric cooler can not keep the meter cool enough.**

1. The FAIL indicator is lit but the meter works all right. Have you actually turned on the cooler? If not, do it. The FAIL indicator should turn off after a few minutes.

2. The FAIL indicator is lit and the cooler is on. Have you attached the purge air hose to the connector? Is there enough pressure in the line? One should feel the air flow in the outlets under the meter. If there is no flow, the tubes are clogged or there is no pressure. Check the hose and pressure. The level should be 1 - 3 bars at the regulator depending on the length and diameter of the hose (usually 8 mm internal diameter).

3. The FAIL light is lit after a half an hour of operation with purge air connected and the cooler is on. The purge air flow is too low. Increase the pressure in the line with a 0.5 bar. Do not exceed the pressure limits of the hose unless you are using a high pressure hose. Note that the pressure difference from the meter to the surrounding ambient is minimal. There is no reason to fix the hose too tightly at the meter end. As long as the optical head temperature limit (+60C in most revisions) is not exceeded, there is practically no effect on proper meter operation. For best signal-to-noise ratio, however, try keep to the head as cool as is possible. In most difficult conditions, apply some sort of extra cooler to decrease the incoming air temperature. Examples of coolers are Vortex tubes and heat pipes.

**F. Symptom: The autotimer starts running when the meter is turned on.**

1. The meter receives a command for starting the autotimer either via any of the digital buses or via the electrical trigger input line. The latter is the most probable cause for this kind of behavior. If no digital interfaces are connected and the meter's autotimer is not turned on when the meter is turned off, the most likely reason is the trigger line. It receives an electrical pulse from the cables. The pulses are generated by external electric motors and other heavy electrical machinery. The strong magnetic fields are induced into the cable wires in spite of the shielding. The way to fix this is to add a capacitor of 0.1 uF 100V minimum between pins 2 and 3 in the screw connectors J1 or J2 (refer to Appendix 5) in the interface board. This circuit board is located inside the distribution box.

**Make sure to turn the power off before opening this box!** The capacitor will eliminate the noise. It is also worthwhile to check the cable shielding connections.

**If all attempts show no proper indication of a working meter, contact us. Do not send back the meter without our permission.**