

## ROTEM INDUSTRIES LTD.

Rotem Industrial Park, P.O.Box 9046, Beer-Sheva 84190, ISRAEL

Tel: +972-8-6564781, Fax: +972-8-6573252, email: [sales@rotemi.co.il](mailto:sales@rotemi.co.il), website: [www.rotemi.co.il](http://www.rotemi.co.il)

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# MediSmarts Verification Procedure

This document describes the internal and external verification procedures that take place in the MediSmarts System.

## Internal Verification Procedure

The Data Processing Unit (DPU) communicates with the detector continuously. The DPU calculates the dose rate and dose every 50 mSec. and uses this data to produce an average which is stored in the DPU and sent to the Central Computer upon request. A unique internal algorithm is capable of differentiating between normal radiation levels and extraordinary high radiation levels which require immediate reporting. Using this algorithm the DPU is capable of providing a smooth report while maintaining the capability to report extraordinary radiation levels.

## Local Verification procedure

The following verification procedures take place on a local scale between each DPU and detector in the field irrespective if the monitoring channel is connected to a Central Computer or not.

There are 3 conditions that are tested:

1. HV power supply and detector malfunction – Error 1
2. Connection between DPU and Detector – Error 2
3. Detector identification – Error 3

1. Detector identification

Upon power up, the DPU recognizes the detector according to two parameters: ID and frequency and there is correlation between these two parameters

The ID is based on three port bits ABC (e.g. GM-42 = 011)

The frequency of each detector is unique (e.g. GM-42 = 10KHz  $\pm$  30%)

So if the DPU recognizes port 011 and the frequency is not in the range mentioned above the monitoring channel will show an error message.

The frequency is also used in the calibration detector procedure

2. HV power supply and detector malfunction

If the High Voltage leveling the detector is not correct, or the detector is malfunctioning, there will be zero pulses from the detector. The DPU will recognize this malfunction and will announce the error.

3. Connection between DPU and Detector

If the cable between the DPU and detector is disconnected, the DPU announce an error within 1 sec.

## System verification procedure

The following verification procedures take place on a **network scale** between each monitoring channel in the field and the Central Computer.



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The computer will query each monitoring channel in order of ID number, one after the other.

If a specific monitoring channel does not answer, the computer will initiate another query to that monitoring channel again. If the monitoring channel still does not answer then after three attempts, the computer will query the next monitoring channel.

The computer will compare the time stamp to the last time data was received by each monitoring channel and if the period is larger than the "Lost Contact" parameter (defined by the user per monitoring channel) then the computer will issue a "Lost contact" alarm.

In addition to these alerts and alarms, MediSmarts allows the user to set 4 different dose rate alert levels as well as 1 dose alarm. The Low Alert is used in case the user is interested in monitoring a minimum value: This parameter is useful for monitoring the flow rate inside the exhaust stack and alarming in case the ventilator fails.

The High Alert alarm is the crucial alarm setting which is used not only to sound an alarm when the radiation is above this threshold, but also activates an internal solenoid. The software enables a user to set and send this threshold to the DPU which retains the value in its memory and will activate the solenoid irrespective of being connected to the Central Computer or not.

Upon Power up the DPU initiates an internal test as follows:

- Display all the bits of the display showing 88:88
- Display installed firmware version
- Display Detector ID: d.42 for GM-42 detector
- Display internal threshold level
- Display DPU address