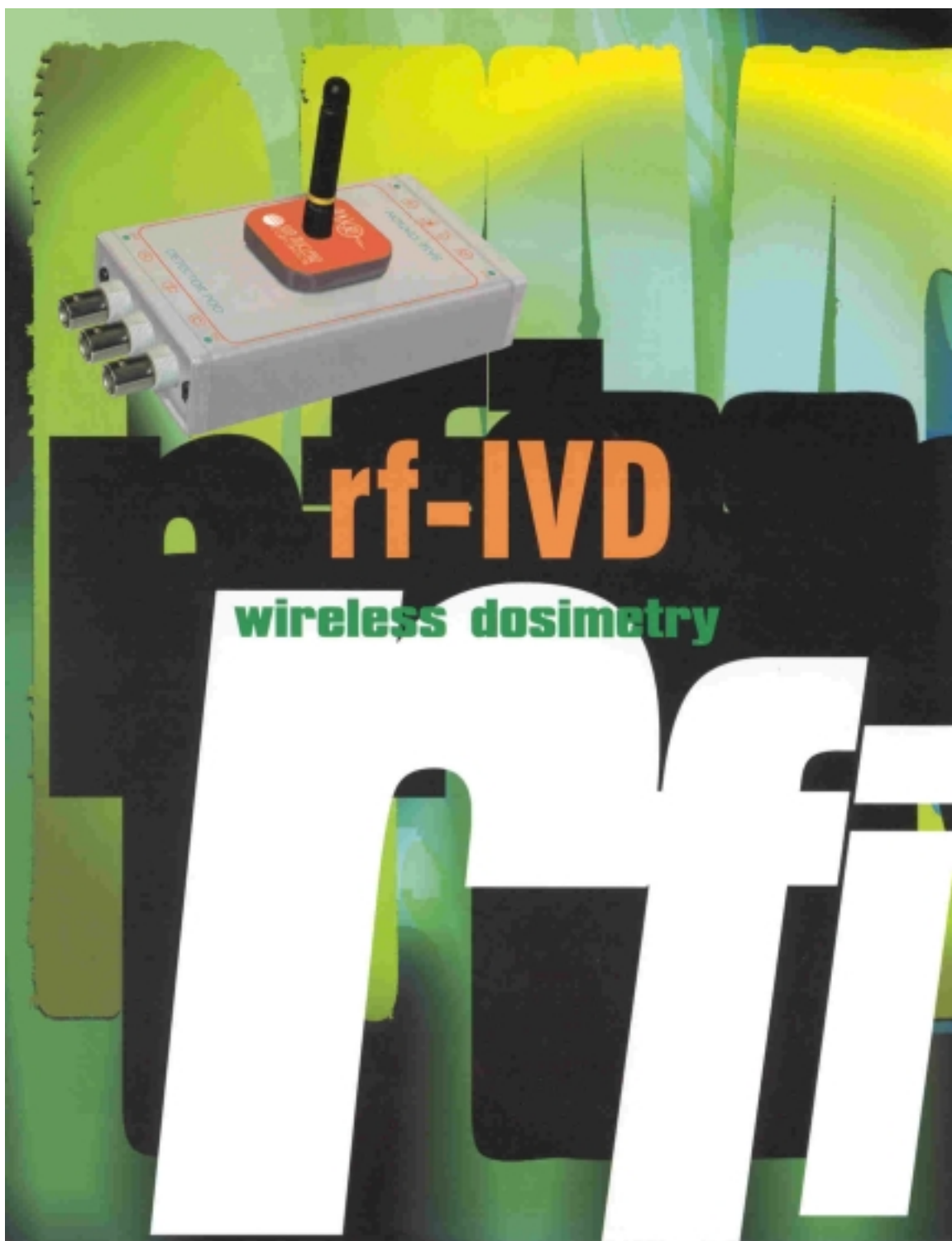
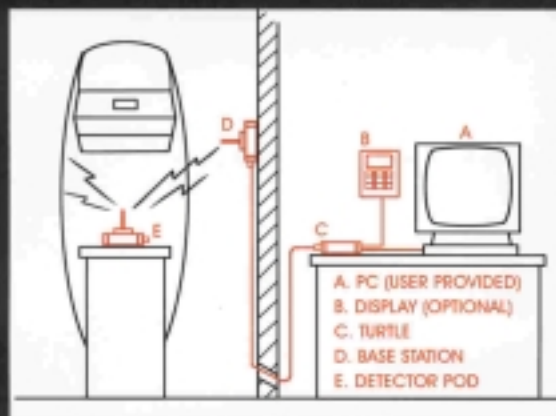


ATTACHMENT A





With the advent of advanced radiation treatment techniques, verification of patient dose has become even more important. As a result, patient radiation monitoring (In-vivo dosimetry) has become the accepted "standard of care".

In-vivo dosimetry (IVD) benefits both clinician and patient. By focusing on the actual dose delivered, in-vivo dosimetry provides valuable feed-back which can be used to both verify and improve the overall treatment.

The new **rf-IVD™** operates similarly to our original IVD™ system except - without the wires.

There are no cables running from the treatment couch, and no cables on the therapy vault floor. The detectors are connected to small transmitters that lie on the couch, next to the patient. Each transmitter radios real-time dose measurements to a receiver mounted on the wall, inside the vault. The receiver is then connected, via cable, to the user interface, at the console. With the new **rf-IVD™**, the detectors are totally independent of the system, making patient movement much easier and eliminating cable "tangle" problems. However, should the rf link be down for any reason, the system may be hard-wired together for continued real-time operation.

While the **rf-IVD™** will interface to a computer, it is not required. All functions, including set-up and calibration, can be performed through the proprietary display module. Each **rf-IVD™** detector pod contains memory; so that, should the rf link go down for any reason, the data may be read out of each pod anytime after the treatment has been completed.

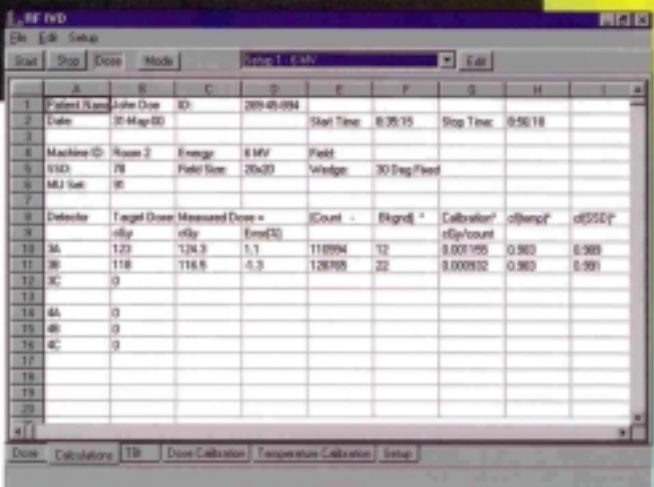
The **rf-IVD™** measures the active junction temperature of each detector. With this information all measured values are automatically temperature corrected.



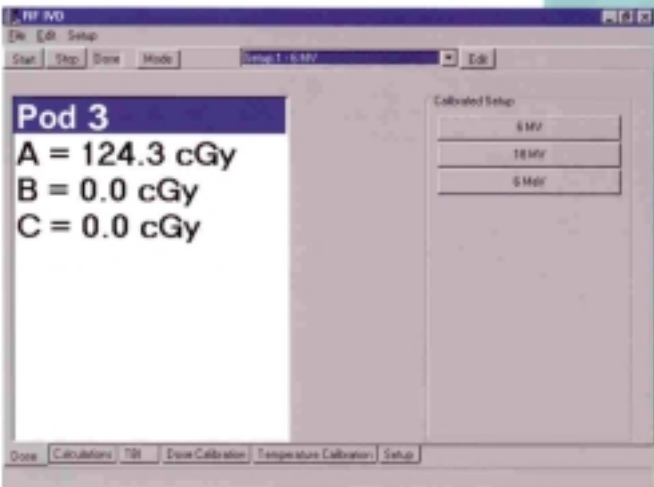


When a computer is used, the **rf-IVD™** software provides a comprehensive yet concise interface. While there is a limit of one detector "pod" or three input channels, when the proprietary display is used; up to 13 detector "pods" may be used in conjunction with a computer. The PC software presents all measured values in a familiar spreadsheet format. Patient information and treatment set-up parameters can be either manually entered or imported from a record & verify system.

The PC software includes a window specifically designed to meet the data collection requirements of TBI treatments. Again, the spreadsheet format makes data presentation and input intuitive and efficient. Total treatment and fraction doses are recorded. Alarms may be set for total treatment and fraction doses. Attenuation factors may be entered which are used to calculate and display mid-plane doses for both total treatment and each fraction.



	A	B	C	D	E	F	G	H	I	J
1	Patient Name	John Doe	ID	200401094						
2	Date	30-May-00			Start Time	8:35:15	Stop Time	9:50:18		
3										
4	Machine ID	Room 2	Energy	6 MV	Field					
5	SSD	78	Field Size	20x30	Wedges	30 Deg/Field				
6	MU Set	80								
7										
8	Detector	Target Dose	Measured Dose		Count	kg/cm ²	Calibration	cGy/count	cTemp	cSSD
9		cGy	cGy	Error(%)						
10	3A	123	124.3	1.1	118994	12	0.00195	0.980	0.980	
11	3B	118	118.6	-0.3	128785	22	0.000932	0.980	0.991	
12	3C	0								
13										
14	4A	0								
15	4B	0								
16	4C	0								
17										
18										
19										
20										
21										



Pod 3

A = 124.3 cGy
B = 0.0 cGy
C = 0.0 cGy

Calibrated Setup:

- 6 MV
- 18 MV
- 6 MeV



specifications

Diode Detector Inputs

Quantity: 3 per pod, expandable to 39 in sets of 3
 Connector Type: BNC coax, 2 lug
 Detector Temperature Compensation: Auto, within 0.1 °C (negative detector current only)
 Calibration: User calibrated against ion chamber standard
 Repeatability: $\pm 0.2\%$ or ± 0.1 cGy
 Detector Requirements: n or p type diodes responding between 5 to 100 nC/Gy
 Polarity: Bipolar i.e., measures positive or negative detector current
 Current Limit: ± 40 nA average radiation current or 1.0 nC per radiation pulse
 Leakage: Auto compensation
 Warm-up Time: < 30 seconds
 Environmental Temperature: 15 °C to 32 °C
 Relative Humidity: 10% to 90% rh, non condensing

Component Definitions, size and weight

Detector Pod: Measure dose received by diode detectors, 3 diodes per pod; 7x12x3 cm, 340 gm
 Base Station: Data relay between wireless Detector Pod and Turtle; 7x12x3 cm, 340 gm
 Turtle: Hardwired communication hub (RS-232 or USB) between PC, Display, and Pod or Base Station;
 7x12x3 cm, 340 gm
 Display: User keypad and display module for start and display of dosimetry measurements; 14x16x3.5 cm, 780 gm
 Printer: Seiko Thermal DPU-414, serial port to Display, 9x320 dots/line, 40 column=9 cm; 16x17x6.6 cm, 580 gm

COMPONENT CONFIGURATIONS

Systems	Basic	Optional
User interface	PC (user provided)	Display Module
Detector Pod(s)	1 (up to 13*)	1
Turtle	1	1
Base Station	1	1
Printer	—	1*
Model Number	1133000-0	1133000-1

* Optional Accessories sold separately

Power

Detector Pod: Rechargeable NiMH battery, 12 hour on full charge
 Display, Turtle, Base Station: Share 15 VDC converter operating on 100-240 VAC 47-63 Hz mains
 Electrical Isolation: Wireless – through radio frequency communication, Manchester encoded
 Hardwired – through optical isolation in Turtle

PC Software (Distributed on CD with all systems)

Dose Range: 0 to 9,999 Gy; 0 to 999.9 cGy; 0 to 999.9 R
 PC: Windows 95/NT4 or higher, Calibration, Measurement, Spreadsheet Analysis, Reports, TBI database
 Display Firmware: Field updateable, Calibration, Measurement, Password protection

Display Module

Dose Range: 0 to 9,999 Gy; 0 to 999.9 cGy; 0 to 999.9 R
 Display: LCD, 2 line, 16 character/line, 8 mm character height, adjustable backlight and contrast
 Keypad: 5 control keys – Function, Enter, Stop, Print, Increment
 12 energy keys (also serve as numeric key entry)
 Measurement: 2 key stroke, select Energy key to start measuring, select Stop when finished.
 Functions: Calibration, Temperature Coefficient Measurement, Password protection, self diagnostics
 Display Firmware: Field updateable

(All specifications subject to change without notice)



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