MIRION Connect 21

Annual Users' Conference

RDS-32
Probes and Aplications

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Product Line Manager / Application Support

Mirion Connect | Annual Users' Conference 2021
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NEW
RDS-32

MIRION Connect 21
Annual Users' Conference

MIRION
TECHNOLOGIES

RDS-32

SUMMARY

- Product Line Overview
- Features and Benefits
- Applications
- Probes
- Accessories

03

PRODUCT LINE OVERVIEW

RDS-32

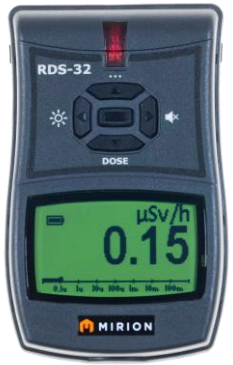
New RDS-32 Product Line

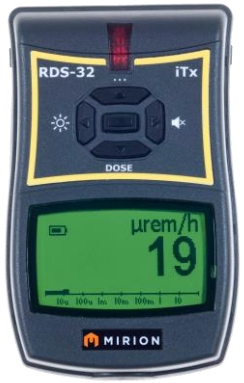
Select the best unit for your applications…

RDS-32 Models

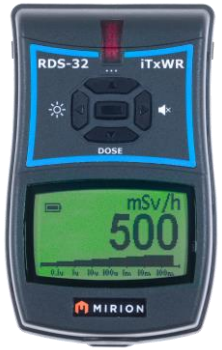
- RDS-32S & RDS-32R
  - G-M tube
  - Range: 0.05 µSv/h to 100 mSv/h (5 µrem/h to 10 rem/h)*
- RDS-32S WR & RDS-32R WR
  - G-M tube and Si Pin Diode
  - Range: 0.05 µSv/h to 10 Sv/h (5 µrem/h to 1000 rem/h)*
- RDS-32iTxS & RDS-32iTxR
  - G-M tube and telemetry 2.4 GHz or 900 MHz
  - Range: 0.01 µSv/h to 100 mSv/h (5 µrem/h to 10 rem/h)*
- RDS-32iTxS WR & RDS-32iTxR WR
  - G-M tube, Si Pin Diode and telemetry 2.4 GHz or 900 MHz
  - Range: 0.01 µSv/h to 10 Sv/h (5 µrem/h to 1 000 rem/h)*

(*) All above models Except RDS-32 iTxSD, are IEC approved from 0.3 µSv/



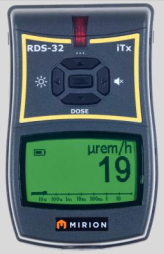


RDS-32iTxS SD



RDS-32 Chart of Models

Launch end of 2021

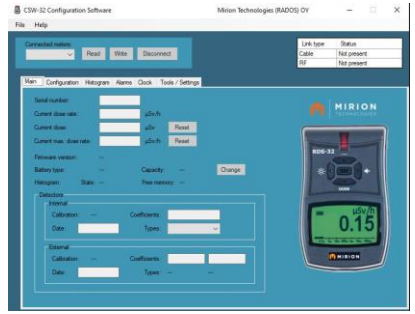
Characteristics	 RDS-32	 RDS-32 WR	 RDS-32iTx	 RDS-32iTx WR	 RDS-32iTx SD
From 50 nSv/h (5 µrem/h)	✓	✓	✓	✓	✗
Up to 10 Sv/h (1000 rem/h)	✗	✓	✗	✓	✓
Telemetry 2.4 GHz or 900 MHz	✗	✗	✓	✓	✓
STD qualified from 300 nSv/h (30 µrem/h)	✓	✓	✓	✓	✗
STD qualified up to 10 Sv/h (1000 rem/h)	✗	✓	✗	✓	✗

Why did we Change?

- The RDS-31 has been popular in North America but those are mainly the telemetry version. We saw a need to expand the sales as a Handheld instrument.
- The vast fleet of probes now available for the RDS makes it unique in the market but a few less than ideal functions have kept it from being popular as just a Handheld.
  - The addition of the CSP Line of probes to the RDS-31 has been an ongoing project. While we have completed the firmware to connect to All the CSP Smart probes, adapting some of the probes to the RDS has been an ongoing project that is finally coming to an end, just in time for the RDS-32.
  - Menu Keys and functions. People disliked the two-button system with the Short, Medium, and Long keypad presses!
  - The RDS-31 needed a wider Dose and Rate range to meet the requirements of Emergency Responders in Europe.
- Since the RDS-31 has been on the market in it current form since 2011, we took this opportunity to add other needed features to make it more modern. However not all the new features will be available upon the initial Product Launch.

RDS-32 Compatibility

- The RDS-32 has the same case, connections and communications that the RDS-31 had. It also has some additional communication capabilities.
- It can utilize all the same probes you used with the RDS-31
- The Link communication cable used for the RDS-31 is the same for the RDS-32.
- The CSW31 software is ***Not*** fully compatible with the RDS-32 because some of the features and menus are now different. It may work for some basic functions but it is Not tested with the CSW31 software.
- The new CSW32 software ***Is*** backwards compatible to the RDS-31 line of instruments.
- The Cradle, Mounts, Battery Boxes and Detector cables are also compatible.
- The Alarm Box though is ***Not*** currently compatible (12/2021)!



For Those Familiar with the RDS-31….

- The RDS-32 incudes the same specification as the RDS-3,1Plus additional features with one minor difference highlighted below:
  - Ergonomic, Rugged Design That is IP-67 Waterproof
  - Rugged Clip option to make it wearable for Hands Free use
  - Long Life (600 hours) Battery Operated on 2 Standard AA's (900 hours for RDS-31)
  - Tissue Equivalent (Rem Filter) Energy Compensated GM Tube
  - Silicon Diode only version used mainly for Area Monitoring.
  - It has an optional internal telemetry Radio (The Smallest Telemetry Area Monitor available)
  - Wide range of accessories for different applications
  - Wide range of Probes with almost every possible function
  - It has a built in Scalar Function to perform Timed Counts.
  - Uses a modified Time to Count technology – So there is no Dead Time
  - Has a 60,000 registry Histogram:
    - Stores the instantaneous dose rates of both internal and external probes as well as the Max dose rate see during the histogram period and finally the Average dose rate for just the meter.
    - It also stores calibration data and daily diagnostic data as well as alarm conditions.

02

FEATURES AND BENEFITS

RDS-32

RDS-32 Benefits

Here is a quick overview of some the Benefits of using the RDS-32:

- Easy to use with better menu navigation and new short cut keys.
- Extremely adaptable to meet any radiological need from the beginning of radiological intervention to "clearing" personnel and material from the area with its suite of "Smart" Probes.
- Saves time and resources by having only one meter to train on and maintain.
- Allows monitoring dose and rate information of personnel at a distance (1 mile line of site) with the Telemetry option.
- Allows entry in almost any radiological area of concern with its Wide Range dose and rate capability.
- *Here is short overview video of the RDS-32*.

Triple Display – Real-Time

QUICKER MEASUREMENT = DOSE REDUCTION

- Simultaneous display of up to 3 measurements with Alpha/Beta probes
  - Alpha contamination, Beta contamination and Dose equivalent rate
  - Alpha/Beta discrimination within the probe
- Simultaneous display of 2 measurements with the dose probes
  - Remote and local dose equivalent rate
- Each measurement can be saved for later use

- **ALARA – Real-time monitoring of your radiation exposure**

Keyboard with Direct Access

WHAT MATTERS INTO ONE CLICK

- Navigation keyboard with secondary functions

Backlight
  - Permanent ON/OFF, Auto OFF (setup in CSW-32)

Audio ON/OFF
  - Chirper, Keypad sound, Alarm acknowledgment (Warning level)

Cumulative Dose, Time to Dose
  - Bar-graph in % of Dose Alarm

User Defined Shortcut
  - setup with CSW-32 the most useful feature for your daily duty
    - Example: data logging or scaler/timer

- **To the point – Reduce access to instrument menu in the field**

User Friendly in the Field

10 Sv/h
1000 rem/h

FROM RADIOPROTECTION TO INTERVENTIONS

- Model WR: 50 nSv/h(*) – 10 Sv/h (5 µrem/h to 1000 rem/h)
  - Reduces the risk of saturation during critical interventions
- Clip
  - Frees worker's hands
- Small and light weight < 250 g (8.8 oz) with batteries
  - No user pain even during long time use
- **Perfectly fits in palm – Comfortable**

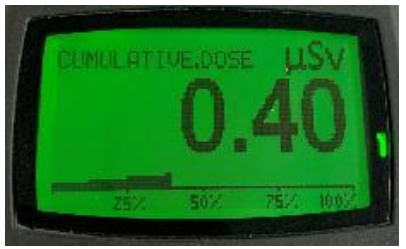
(*) qualified to IEC 60846 standard from 300 nSv/h (30 µrem/h)

MIRION TECHNOLOGIES

Direct Access to Dose Screen

FOLLOW UP YOUR INTERVENTION DOSE

- First press on «Dose» key
  - Cumulative dose display
    - Since last RESET = Intervention dose
    - Bar-graph in % Dose alarm



- Second press on «Dose» key
  - Time to dose alarm display
    - In current dose-rate

- **Cumulated Dose screen – Monitor your intervention**

Double Alarm Set-point

WARNING Vs. DANGER

- Dose-rate – All applications
  - Warning = Presence of radiation
    - User can acknowledge audio, vibrator and LED
  - Alarm = Presence of radiation danger
    - No acknowledgement allowed

- Cumulative Dose - Intervention
  - Warning = Halfway dose reached
    - Recommendation to start moving backward
    - User can acknowledge audio, vibrator and LED
  - Alarm = Maximum intervention dose reached
    - No acknowledgement allowed

- **Dual Alarm – Understand your environment**

MIRION TECHNOLOGIES

Scaler/Timer

DETECTION LIMIT IMPROVEMENT (MDA)

- Gross or net measurement
  - Gross only for dose-rate
- Direct or indirect (smear) measurements
- Choice of unit depending on contamination probe connected
  - c/s, Bq, Bq/cm², cpm, dpm equivalent to calibration isotope
- Automatic data saving

- **SCALER – Improve your measurements**

MIRION TECHNOLOGIES

Telemetry

REMOTE SUPERVISION

- Model RDS-32 iTx (WR)
  - 2.4 GHz radio for Europe and Asia
  - 900 MHz radio for North America
- Connection to AWM
  - Up to 12 connected meters (RDS-32 or DMC3000)
  - No PC required
- Nuclear site (iTx)
  - Remote supervision of risky interventions
    - Human or robots
- Emergency follow-up (iTx WR)
  - Remote follow-up of responder teams

- **iTx Model – Focus on your interventional work**

MIRION TECHNOLOGIES

03

APPLICATIONS

RDS-32

Follow-up response

- Monitor the intervention dose

Removal of all doubt and radiation protection

- Contamination check
- Dose equivalent rate

Contamination control on personnel and objects

- SAB-100

Search for radiation spots Dose-rate & Contamination

- SABS-579
- TELE-STTC

Smears, filters check

- Easy-Count

Monitoring of public areas

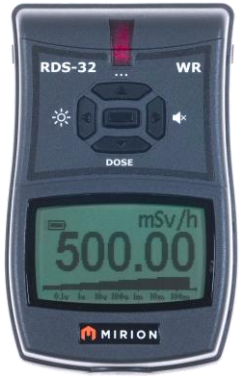
- SVLD

Neutron dose-rate measurement

- SN-D-2

RDS-32 Use for Responders

- New changes were added for Emergency and Follow-up Responder use.
  - The Higher dose and rate range was added specifically to meet the IEC 60846-2 standard and soon to meet the ANSI N42.17
  - The additional alarm capability (*We will show a short video below*)
  - The Time do Dose Alarm
  - The specific short cut buttons for easier operation
  - Allows addition of external contamination probes for multiple functions
- The RDS-32 should not be confused with a PRD like the AccuRad.
  - The PRD has a lot of some functions and capabilities but is designed for Detection of Radioactive material and has a higher sensitivity.
- The RDS-32 use for Emergency workers is to Protect them during their interventional working during disaster events and to help Clear and Release after an event.



How Can Your Site Benefit from using the RDS-32?

- The large variety of external probes ensures the RDS-32 is the most flexible instrument available. Just one meter designed to meet almost all of your radiological needs!
- Almost All of the RDS-32 probes are “Smart” probes which mean they are not “married” to a specific meter.
- This allows for a smaller stock of instruments as the RDS-32 has probe options to replace multiple meters (Dose Rate, Contamination and Scaler)

CSP Compatibility Matrix

		SABG-15+ GM Pancake	SPAB-15 PIPS Detector	SA-20-2/SA-32 ZnS Scintillator	SB-20 Plastic Scintillator	SB-32 Plastic Scintillator	SAB-32 Plastic/ZnS Phoswich	SA-100 ZnS Scintillator	SB-100Plastic Scintillator	SAB(G)-100 Plastic/ZnS Phoswich	SAB-250 Plastic/ZnS Phoswich	SABP-525 Plastic/ZnS Phoswich	SABS-579 Plastic/ZnS Phoswich	EASY-COUNT Silicon PIPS	SG-1R NaI(Tl) Scintillator 1" x 1"	SG-2R NaI(Tl) Scintillator 2" x 2"	SX-2R NaI(Tl) Scintillator 1.5" x 3mm	PNK-R Pancake dongle	Dongle-AB For conventional Alpha/Beta probes	SN-5 Moderated Helium 3 Tube	SN-D-2 Moderated Helium 3 Tube	SVLD Energy Compensated CsI(Tl)	STTC Energy compensated G-M Detector	TELE-STTC-2 Energy compensated G-M Detector	SVHD Silicon PIN diode
		 Multi-purpose contamination probe	 Alpha-Beta discrimination in high Gamma background	 Contamination check in high Gamma/ Neutron background	 Beta contamination check in high Gamma background	 Personal Beta contamination check	 Alpha/Beta discrimination for personal frisking	 Large area Alpha contamination check	 Large area Beta contamination check	 Alpha/Beta discrimination on large contamination area and personal frisking	 Large area Alpha/Beta frisking or hand counting	 Alpha/Beta counting on foot	 Alpha/Beta contamination control on floor	 Field Alpha/Beta SmearFilter Counter	 Low dose-rate and Gamma contamination probe	 Very low dose-rate and Gamma contamination probe	 Low energy Gamma/X and Alpha contamination check in humid environment	 Adapt existing pancake probes - Not fully CSP	 Adapt existing Alpha/Beta probes	 Neutron presence detection	 Neutron dose equivalent rate	 Very low H*(10) dose equivalent rate probe for public working area checks	 Wide range H*(10) dose equivalent rate to ICRP-60	 Wide range H*(10) dose equivalent rate to ICRP-60	 Very high dose rate probe for fuel control
		α β γ	α/β	α	β	β	α/β	α	β	α/β (γ)	α/β	α/β	α/β	α/β	γ	γ	α X γ	α β γ	α β	n rate	n dose	γ dose	γ dose	γ dose	γ dose
	Measurement Type	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count rate and Dose rate equivalent	Count rate and Dose rate equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate and isotope activity equivalent	Count-rate	H*(10) Dose rate	H*(10) Dose rate	H*(10) Dose rate	H*(10) Dose rate	H*(10) Dose rate
CSPS Capabilities	Calibration & Setup	HV plateau	No	HV plateau	HV plateau	HV plateau	HV plateau - α/β crosstalk	HV plateau	HV plateau	HV plateau - α/β crosstalk	HV plateau - α/β crosstalk	HV plateau - α/β crosstalk	HV plateau - α/β crosstalk	HV plateau - α/β crosstalk	HV plateau - Isotope dose equivalent	HV plateau - Isotope dose equivalent	HV plateau	No	HV plateau - crosstalk	HV plateau	Dose coefficient	Dose coefficient	Dose coefficient	Dose coefficient	Dose coefficient
		Activity coefficient - Alarm setpoints	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Low energy discriminator - Alarm setpoints	Low energy discriminator - Alarm setpoints	High energy discriminator - Alarm setpoints	Activity coefficient - Alarm setpoint	Activity coefficient - Alarm setpoint	Alarm setpoints	Alarm setpoints	Alarm setpoints	Alarm setpoints	Alarm setpoints	Alarm setpoints
	Data-logging transfer	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
	Acquisition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	PC cable	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM80808 calib box	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466
	CSP-COM	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
	Minimum Firmware version	V1.1.0	V1.1.0	V1.10	V1.1.0	V3.0.2	V3.0.3	V1.1.0	V1.1.0	V1.1.0	V3.0.5	V3.1.0.0	V3.0.2	V2.20	V2.0.0	V2.0.0	V1.2.0	V2.0	V3.0.0	V2.0	V3.1.0.0	V3.0.0	V2.0	V2.0	TBD
Radiagem 2000	Cables	Cables Set 1 + Direct connection	Cables Set 1 + Direct connection	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	N/A	Cables Set 1	Cables Set 1	Cables Set 1	EM77336 EM77337	Direct connection only	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	In pole	Cable set 1
	Minimum Firmware version	V2.23	V2.23	V2.23	V2.23	V2.23	V2.23	V2.23	V2.23	V2.23	V2.23	V2.23	V2.23	N/A	V2.23	V2.23	V2.23	V2.23	V2.26	V2.23	V2.28	V2.25	V2.23	V2.23	V2.23
	Data-logging control (2)	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	N/A	Yes in probe memory	Yes in probe memory	Yes in probe memory	No	Yes in dongle memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory	Yes in probe memory
	CSP-COM	No	No	No	No	No	No	No	No	No	No	No	No	N/A	No	No	No	No	No	No	No	No	No	No	No
RDS-31	Cables	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	N/A	N/A	Cables Set 2	Cables Set 2	Cables Set 2	Cables Set 2	In pole	Cable set 2
	Minimum Firmware version	V3.05.5	V3.05.5	V3.05.5	V3.05.5	V3.05.5	V3.05.5	V3.05.5	V3.05.5	V3.05.4	V3.05.5	V3.05.5	V3.05.5	V3.05.5	V3.05.4	V3.05.4	V3.05.4	N/A	N/A	V3.05.4	V3.05.5	V3.05.5	V3.05.5	V3.05.5	TBD
Colibri	Cables	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	EM77336 EM77337	Direct connection only	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	In pole	Cable set 1
	Minimum Firmware version	V2.2	V2.2	V2.2	V2.2	V3.0.3 Platform 1.1	V3.1.1 Platform 1.1	V2.2	V2.2	V2.2	V3.4 Platform 1.1	V3.4 Platform 1.1	V3.0.3 Platform 1.1	V3.0.1 Platform 1.1	V2.2	V2.2	V2.2	V2.2	V2.7	V2.0	V3.0.3 Platform 1.1	V2.6	V2.2	V2.2	TBD
	Data-logging control	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in Colibri memory	Yes in probe memory
	CSP-COM-BT	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	No	(1)	(1)	(1)	(1)	(1)	(1)	(1)
AVIOR-2/ MIP-2	Cables	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	EM77336 EM77337	Direct connection only	Cables Set 1	Cables Set 1	Cables Set 1	Cables Set 1	N/A	Cable set 1
	Minimum Firmware version	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.1.2	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	V1.0.0	N/A	TBD
	Data-logging control	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instrument memory	Yes in instru-ment memory	Yes in instru-ment memory	Yes in instru-ment memory	Yes in instru-ment memory	Yes in instru-ment memory	Yes in instru-ment memory	Yes in instru-ment memory	N/A	Yes in probe memory
	Hand/Foot mode	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	N/A	No
	CSP-COM	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	N/A	No
Specific Application Software Development	PC cable	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	No	EM78466	EM78466	EM78466	EM78466	EM78466	EM78466	EM78467
	CSP-PL SDK compatibility CSP-COM-BT CSP-COM Ethernet	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**Yes** Acquisition and Unit selection	**No**	**Yes** Acquisition and unit selection	**Yes** Acquisition	**Yes** Acquisition	**Yes** Acquisition	**Yes** Acquisition	**Yes** Acquisition	**Yes** Acquisition

Cables Set 1: EM77336: 1.5 meter straight cable / **EM77337:** 0.7 – 1.5 meter coil cable / **EM99006:** 10 meter straight cable / **EM98830:** 20 meter straight cable
Cables Set 2: 1233-318: 0.3 meter straight cable / **1233-319:** 1.5 meter straight cable / **1233-320:** 0.7 – 1.6 meter coil cable

(1) Except for Colibri-Basic version (not bluetooth capable)
(2) Requires CSPS to read data-logging in Computer

How Can Your Site Benefit from using the RDS-32?

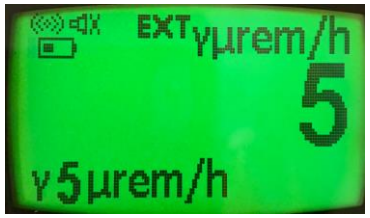
- The additional accessories for the RDS-32 allows multiple applications:
  - Power options:
    - Short and long term battery options are available when “house” power is not.
    - Multiple options for 110V power (including using the Cradle), POE and USB (so you can power in your car)
    - Solar is the last option and typically used for Perimeter Monitoring, but it is possible for other applications.
  - The cradle also provide a wide variety of mounting options that allows for different applications.
  - There are two different alarm enclosures to provide additional warning of dose rate changes.
  - It allows an almost infinite variety of Emergency Kits to be created based on the customers needs.

How Can Your Site Benefit from using the RDS-32?

- When using contamination probes, The Smart aspect includes the efficiency of the probe, so you can read in Activity. No correction factors needed and no over reporting contamination by using the standard X10 for frisker probes.
  - The RDS-32 can utilize the size of the contamination probe also and read out in Bq/cm2.

How Can Your Site Benefit from using the RDS-32?

- The RDS-32 has an internal detector, and even when an external probe is utilized the user always sees the internal dose rate as well as the probe reading:
  - Contamination Probes – Allows dose rates and smears with one instrument.
  - Dose Rate Probes – If utilizing the SN-D-2 for example the user will see both neutron and gamma reading with one instrument.
  - Area monitors – With an external dose rate probe this allows, a contract reading utilize the meter in the General Area to monitor both changes contact dose rate and potential boundary changes.



External Probe Alpha & Beta

Internal Detector Dose-Rate

External Probe Displayed Unit (dpm)

External Probe Readings

How Can Your Site Benefit from using the RDS-32?

- A single instrument platform makes training to use these instruments a much simpler proposition compared to training on multiple different instruments to do the same job.
  - In additional, we have the Sim-Teq Training equipment incorporates both the RDS-31iTx and the GMP-25 frisker probe for “real life” training on dose rates, contamination, and telemetry! RDS-32 version is coming later.

04

PROBES

RDS-32

CSW Probes

- Dumb Probes – These probes are typically utilized for a specific purpose, long term high dose rate monitoring. This is the GMP-12SD Probe
- The GMP-12SD was designed to last a full two year fuel cycle at dose rates of approximately 5 rem/hr (a life dose of 90,000 rem).
- The probe use Silicone Diode (SD) detectors, similar to what is in the dosimeters. One advantage of a SD detector is the linearity for energy response is better than the normal GM probes. This was important as this was designed to be in Nuclear Steam affected areas which means mostly the 6 Mev N16 photons. GM tubes would greatly over respond if not calibrated to that energy.
- The last thing to note is we create an underwater version (GMP-12UW) which is the same except for the weighted black cap that makes it negatively buoyant and it tested down to 3 atmospheres

More CSW Probes

- All the other probes are considered Smart Probes. They have memory for their calibration information, which is why they cannot take the higher absorbed doses.
- The initial probes created for the RDS-31 (GMP-12SD/UW, the GMP-25i and GMP-12GSD) are calibrated with the RDS software (CSW31 or CSW32).
- The GMP-25i is a standard pancake frisker probe except it can store its calibration information based on the specific isotope of interest.
  - This is Much more accurate than using a X10 correction factor. Efficiencies for pancake probes for Tc99 is 12-15% so using X10 over reports the activity by 20-50%.
- The other original smart probe (GMP-12GSD) has a low range GM tube with a high range SD. This is the similar and has the same range as the new Wide Range version of the RDS-32.

CSP Probes

Since these is considerably more CSP probes we will break them up into groups.
These are all Smart Probes!

There are quite a few CSP probes and to make it easy to understand the nomenclature of all the various probes we will define the main ones before we start:

"S" – This designates them as a Smart Probe
"A" – This designates them as being able to see Alpha activity.
"B" – This designates them as being able to see Beta activity
"G" – This designates them to able see Gamma Activity.
"N" – This designates them to be able to see Neutron activity
"X" – this designates them to be able to see low energy X-Rays.
"- XXX" This number is the Contamination probe surface area.
"TTC" – This designates it as Time to Count probe.
"VLD" – Very Low Dose Rate
"VHD" - Very High Dose Rates.

CSP Probes Highlights

- Each probe features one or more strategic benefits
  - Very good discrimination for alpha/beta probes SAB*-***
    - ✓ Simultaneous α/β measurement: better application coverage
  - Extremely wide range for gamma dose: STTC
    - ✓ One detector only fits most applications from 0.1 µSv/h to 10 Sv/h (100µrem/h to 1000 rem/h)
    - ✓ No double detector switching/screening effect
  - Very light weight TeleProbe: TELE-STTC
    - ✓ Very easy to carry and expand
  - Button controlled Energy Discriminator for gamma: SG1(2)-R
    - ✓ Confirm high energy presence
  - Very low energy (5 keV) for X-Ray: SX-2R
    - ✓ Allows α/β measurement in case of humidity or X-ray leakage search
  - Durability and never matched α/β discrimination using PIPS: SPAB-15
    - ✓ Not pressure sensitive, no fragile entrance window
    - ✓ Minimum beta to alpha crosstalk
    - ✓ Very small gamma sensitivity
  - Best ever sensitivity to weight ratio for a µrem Meter: SVLD
  - Easy to maintenance for Window based probes
    - ✓ Reduces probe down time

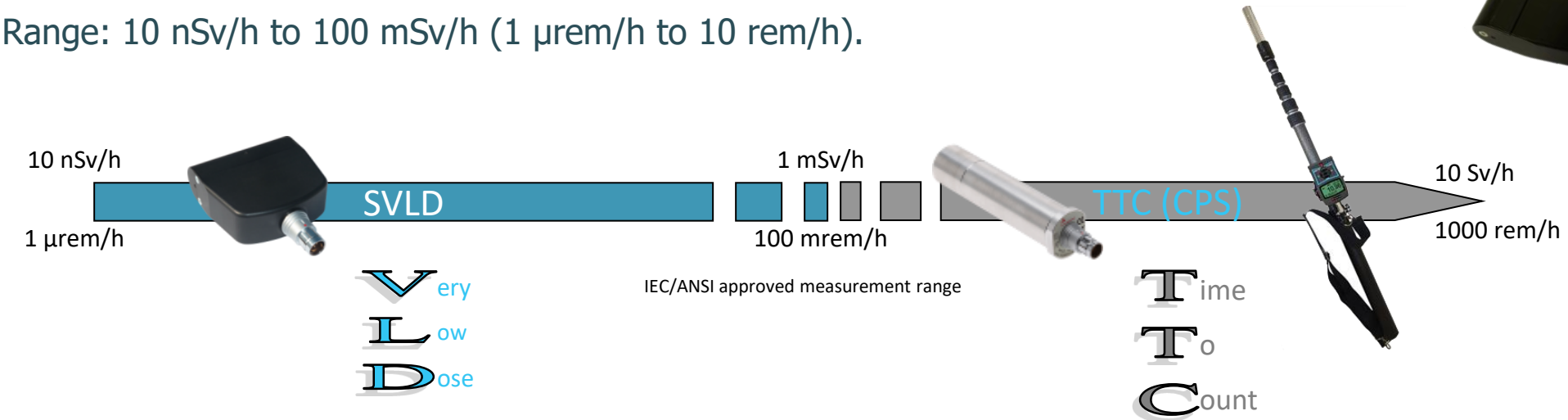







CSP Gamma Dose Rate Probes

- STTC and STTC W (TELE-STTC-2 on next slide)
  - These are wide range dose rate probes base on one unique G-M using Time To Count technique with the W being the Underwater version to 4 atm.
  - Range: 100 nSv/h to 10 Sv/h (10 µrem/h to 1000 rem/h).
  - STTC-W is a little bit more expensive and has a single installed cable option of 20 M on a reel.
  - STTC has three cable lengths but also has a max of 20M
- SVLD
  - This is a small scintillator with H*(10) energy compensation and can be connected to make a very responsive, compact, microrem meter.
  - Range: 10 nSv/h to 100 mSv/h (1 µrem/h to 10 rem/h).



SVLD VALUE PROPOSITION

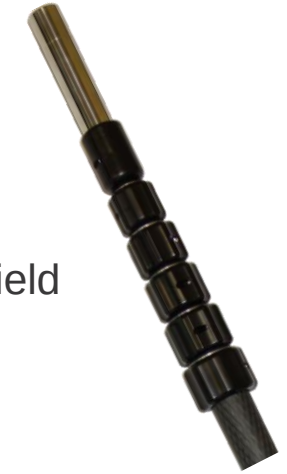
Very Low Dose

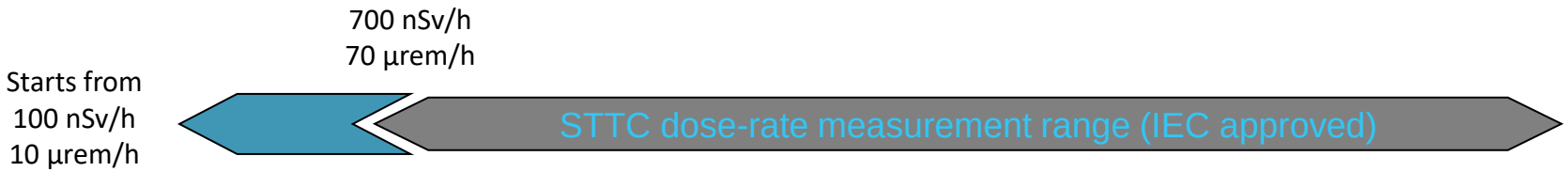
- Traditional Health Physics Users
  - Extends application range of RDS-32 and other CSP instruments
    - ✓ Leverage existing CSP instruments to cover additional duties
      - Reduce Total Cost of Ownership (TCO)
    - ✓ Maximize single instrument usage for multiple applications
- Daily use
  - Compact and integrated solution for wide range of operation
    - ✓ Covers the necessary range with very small size – One hand use only
    - ✓ Use SVLD to cover occasional low dose-rate measurement
      - Instrument internal detector covers higher range
- Initial investment
  - SVLD probe price represents only a small portion of existing µR meters currently on the market

TELE-STTC-2/RDS

Time To Count

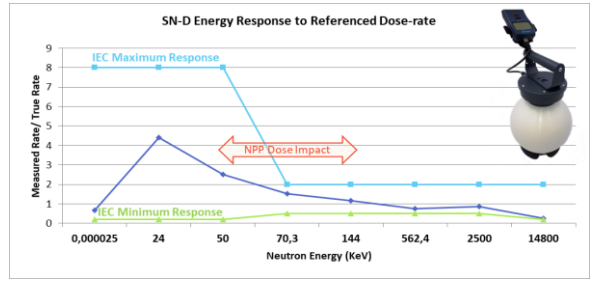
- Two models:
  - Regular (TELE-STTC-2/RDS)
    - ✓ Include additional quarter turn ring to prevent standard rings to fall apart in the field
  - Light (TELE-STTC-2L/RDS)
    - ✓ Utilizes regular rings only
- Additional improvement were made to increase reliability in the field
- Get both internal and external rate on screen (can be disabled on setup sw)
  - Users can see their dose rate as well as the remote dose rate from the pole
  - NOTE – you can eliminate the internal rate from display if required.
- It uses a single G-M tube with TTC technique
  - Eliminates cross ever point and screening effect coming from dual detector





CSP Neutron Probes

- SN-D-2
  - This is a 200 mm (7.75”) rem ball. Range: 100 nSv/h to 10 Sv/h (10 µrem/h to 1000 rem/h).
  - The new ergonomic form factor makes it smaller and lighter than the normal 9” sphere.
  - When the RDS-32 is added, you have both gamma and neutron dose rates in one meter!
  - It features a perfect fit of latest IEC standard energy response between thermal neutrons up to 15 MeV
    - Median response in the energy range of interest (50-150 keV) that contributes the most to dose in NPPs.



- SN-S
  - This is a neutron search probe
  - It is not designed for dose-rate, only CPS
  - More HLS use, and possibly with a drone
  - Detects Cf-252 source of 20,000 neutrons per second at 25 cm in 2 seconds

Coming soon - SVHD CSP Probe

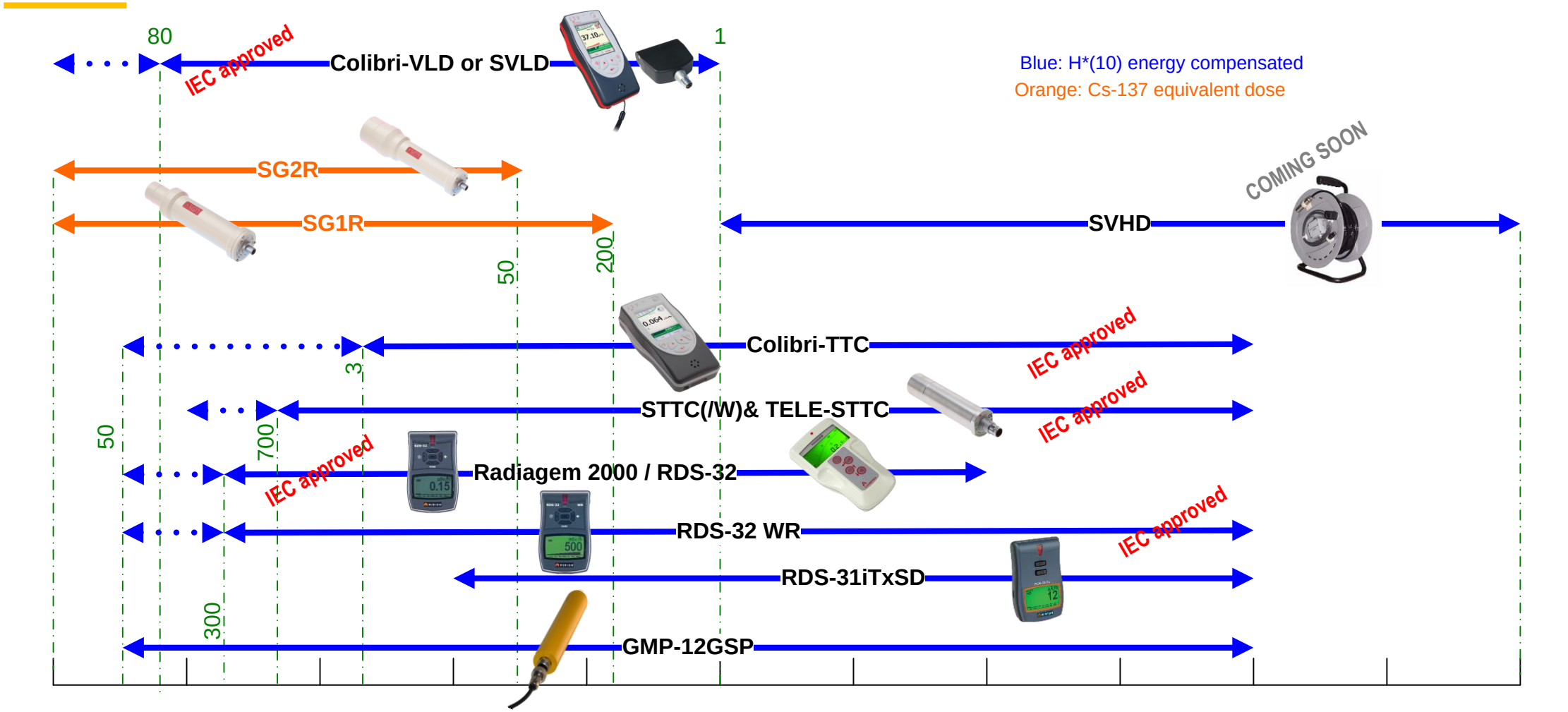
Very
High
Dose

- SVHD
  - High range dose-rate probe up to 1000 Sv/h (100 krem/h)
    - Remote electronic to stay operational up to 5 kSv (500 krem) lifetime dose
    - 50 meters (160 ft) cable on reel
  - Successor of STHF that was not CSP yet with improvements
    - Smaller detection head diameter: less than 11 mm (0.43 in.) to go down 15 mm bore pipework
    - Low friction cable to facilitate pushing cable through shield plugs
    - IP68 - Waterproof to 8 atmospheres in Borated water
    - Ballast option to make it negatively buoyant

STHF

SVHD

Dose-rate Instruments Ranges



CSP Contamination Probes

- SABG-15 and SPAB-15 – These are Frisker probes. The SABG-15 uses a standard Pancake GM tube and while it can see alpha, beta and gamma activity it cannot distinguish between them. SPAB-15 Uses a PIPs detector and has separate alpha and beta channels.
- SA-32 and SA-100 – These are Alpha Only probes. All are ZnS scintillators. There main advantage compared to the SAB probes is they can be used in higher background areas.
- SB-32 and SB-100 – These are Beta Only probes. The low energy beta efficiency is a little better without the ZnS coating and it is just a little less expensive.
- SAB-32, SAB-100 and SABG-100 – These are alpha beta probes utilizing plastic scintillation and ZnS coating. The difference with the SABG (Gamma version) is it has a thicker plastic scintillator which makes it more gamma sensitive and also increases beta efficiency (great for Co-60).
- SG-1R and SG-2R – these are 1" and 2" NaI detectors. They do have a half window that can cut out the bottom of the spectrum (for instance to see only Co-60 or K-40). These can be used for dose rates as well, a very sensitive uR meter.
- SAB-250 – This is a new probe and pretty much what the name implies, it is a 250cm2 alpha beta probe. We have a wall mount for this for hand frisking and can show both alpha and beta at the same time for Radon Screening.
- SX-2R – this is a low energy X-Ray Probe. It can see down to 5 Kev X or Gamma rays. It also has a momentary window that can be engaged with the push button, but this window is opposite of the SG-1/2R as it cuts out the Top half of the spectrum and measures the bottom.

RDS Screens for SAB Contamination Probes

- Screen selection is probe button driven
  - LED Off: Alpha only
  - LED On: Beta Only
  - LED Blinking: Alpha & Beta
- Unit is selected on RDS-32
  - Cps, cpm, dpm, Bq, Bq/cm²

LED OFF

LED ON

LED Blinking

EASY-COUNT

- This probe was designed to be a light weight (4.6 lbs) portable sample counter. It has a folding handle to make deployment easier.
- It uses a 17 cm^2 PIPS inside but has the same selector switch for alpha counts, beta counts and both alpha and beta (as seen in picture).
- The scaler function of the RDS-32 can be set for different times (10 sec. to 60 min) or to reach a total count (100 counts to 20,000 counts)
- If a Background count is done you can automatically get Net counts, or you can chose to get Gross counts.
- The RDS-32 powers the Easy-Count but has limited life (~20 hours with Alkaline batteries). Lithium batteries should bring the life to around 48 hours.
- Since it utilizes the RDS power cradle, it can be kept charged when not in use if you chose the NiMH option on the RDS-32

EASY-COUNT

- The drawer that opens has an insert which has different opening on either site. This allows for two different planchet sizes and certain media can be counted directly. An example being the iCAM filter or standard smear holder as shown below.
- The Easy-count was developed initially for the SRS site to replace an older PDA based counter. They have a lot of units in the field and have help find an additional way to improve the Easy Count.
- Optional specific sample cover to prevent smear edges from causing scratches on the PIPS detector

CSP Specialty Probes – SABS-579 Floor Monitor

- This is new addition to the RDS probes.
- It uses a 579 cm^2 Alpha Beta plastic detector from the Argos which is widely used and reliable. This probe requires Lithium batteries to be used in the RDS!
- The wheels cushioned to reduce microphonic noise and are adjustable to allow the user to determine the measurement distance to the ground.
- The units is light (~25 lbs) and had a handle on the detector side for ease of movement such as putting it up on a flat bed trailer to survey for release.
- Alarm setpoints are configured with the CSP software.
- The intention of the unit was for dynamic measurements and MDA's have been determined (for backgrounds <10 uR/hr).
- The best conversion to US units for beta activity equated to an MDA of 6600 dpm while moving at ~3"/sec and 0.314" from the surface.
- I chose this MDA to compare to what the NPP standard frisking speed of 2"/sec at 0.25" with a release limit of 5000 dpm.
- You can do static measurement using the Scalar Mode, 579 cm2 at a time and with a 10 second count time you can get down to a 2700 dpm MDA.

05

ACCESSORIES

RDS-32

Accessories – Area Monitor & Alarm / Battery Box

- Because of the Telemetry capability, the initial uses of the RDS in the US were as area monitors. The first accessory developed for the RDS was allow it use as an area monitor long term, on battery power alone for up to two years of operation. Added to this were external audio and visual alarm indications. In addition, it has a connection to an external CSW probe. However, this currently does Not include the CSP Probes.
- The other alarm box is 110V powered and has a larger light tower and siren and is easily mounted. It also allows connection to all external probes including the CSP probes. It also has an optional network card to pull the data through the network for those locations where wireless is not allowed.
- Both of these can be attached easily with the magnetic mounts or by securing with the mounting brackets.

Accessories – Power Cradle & CSP Mount

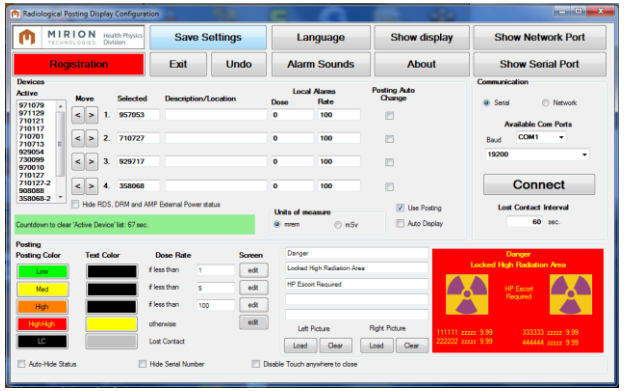
- The Power Cradle is the key to a lot of different possible accessories. Other than providing Power to the RDS through the charging ports, it provides unlimited mounting capabilities.
  - Basically any camera mount can be used to connect to the ¼" x 20 threaded insert in the cradle.
  - Since there are thousands of OEM mounts available, you can literally mount it almost anywhere. Here are a few:
    - Suction Cup mount to mount on your FMT vehicle windshield. You can even power it with USB in the car.
    - Handle bar mount to use on your GMP-25 probe
    - Desktop mount to set up a frisking station
- The CSP mount can be used for one hand operation of almost any CSP contamination probe as well as the SG-1R/2R and the SN-S neutron Search probe.

Accessories – Kits

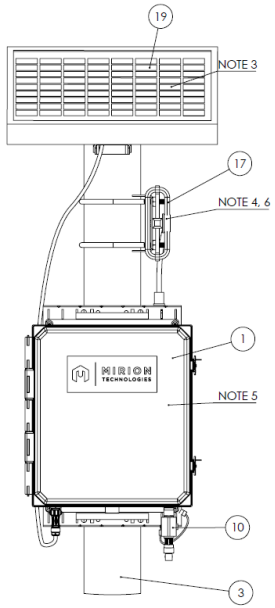
- Because these instruments are fairly compact, and they have some many probe options, creating Kits for them is very popular with Emergency Response both at NPP's and for state and local agencies.
- The Grab and Go brief case size kits can hold everything you may need to respond to your specific radiological situation.
  - Briefcase size cases to hold multiple meters and detectors
  - Meters may be powered by USB for long term deployment (this means you will never have to worry about the batteries going dead on drill day)!
  - Accessories for easy mounting (e.g. windshield mounts)
  - Kits tend to be individualized so normally "pluck" foam is used but for orders of 10 or more we can have nice custom cut inserts made.
  - While we mention EP a lot for Kit use, having the ability to have one meter and multiple probes allows flexibility for other functions. Radwaste techs prefer to have their own equipment. You can add a Tele STTC probe with the SAB-100 for counting smears (just need a bigger case).

US / Canada Only Accessories – Radiological Posting Display (RPD)

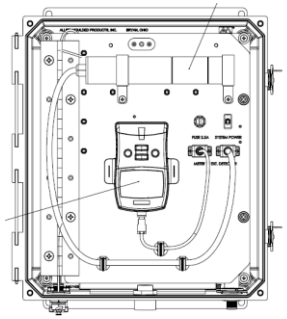
- The RPD is a self contained, dynamic display of radiological conditions in the area. As the dose rates change so can the signage.
- There are two versions of the RPD. One with an internal base receiver to pull any WRM telemetry data, or one with an internal RDS-32.
- The presentation is about the RDS version. Normally the RDS-32 inside is an iTx version so that sites can monitor the dose rates at the RPD on their normal telemetry software. The non transmitting version can be use for local information only.
- It does require 110V power and uses a mini computer, with the RDS-32 and a large 16” display to make the conditions visible at a good distance.
- The software is easy to use and very configurable to create what ever signage the customer needs.



US / Canada Only Accessories – Perimeter Monitoring



DETAIL B
SCALE 1 : 5
DETECTOR
DETAIL

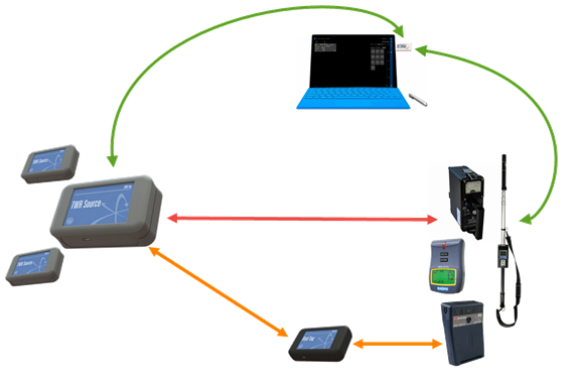


MONITOR ENCLOSURE
DOOR OPEN

- The low power consumption and the ability to utilize external probes makes the RDS well suited for these applications.
- There are several versions of perimeter monitor options. From battery powered only to AC powered and Solar Powered.
- The solar options include a simple version that is just a RDS-32iTx with a small solar panel and battery and the charge controller. In this case the internal Radio of the RDS-32 is used.
- Other solar options are more complex pulling the data from the RDS into an AWM which can be in Repeater mode and have external probes connected to it. This is an advantage for perimeter monitoring because being a repeater, you just need to connect to one other monitor to get all the way back to the site.
- Finally you can add Teleview 3000 telemetry software to be able to see these perimeter monitors live time on Google maps.

Accessories – Training Equipment

- You can't have an instrument program without Training personnel on the equipment! But, you don't want to have to deal with real sources or radioactive material while Training.
- Like the other Sim-Teq equipment we sell, this training equipment has all the functionality of a regular RDS including the built in WRM2 Radio and responds to the Sim-Teq dose rate sources.
- In addition, when you add the GMP-25TD (Training Device) you can add contamination sources to allow realistic response when frisking. This uses RFID and sources of specific strengths so they can be put in pockets, under dressings or under a smear.



CSW-32 Software

- USB connection
- Dose internal Detector(s) Calibration
- Instrument Setup
- Menu item selection
- Instrument Shortcut setup
- Instrument firmware update
- Data transfer

RDS-32: Only one Limitation…Your Imagination!

Any Question
?