



# MIP 10 *Digital* Desktop Dose Rate and Survey Meter

## Features

- Measurement of contamination and dose rate
- Rugged and easy to use
- Customizable alarm setpoint
- Scaler/Timer mode
- Backlit digital display
- Analog-like bargraph with digital display
- Back-up built-in rechargeable batteries
- Compatibility with CANBERRA's previous probe generation (Nardeux)
- Supports CSP™ probes
- Fast bargraph response
- Easy to decontaminate
- Compatible with MIP 10 accessories
- Upgradable product through firmware upgrade

## Description

The MIP 10 *Digital* is a versatile alarm desktop dose rate and survey meter. Its large base of associated probes covers numerous applications. The MIP 10 *Digital* is a standalone and resistant device adapted to various environments such

as laboratories, industrial facilities, and open air yards. It is widely used for alpha and beta contamination (hands, clothes, worktops) and nearby nuclear facilities. It is also used for gamma irradiation measurements in nuclear reactors, accelerators, irradiators and Curie therapy instruments.

The MIP 10 *Digital* comes with two probe inputs, one dedicated to the previous generation CANBERRA probes (Nardeux) and one to the CANBERRA Smart Probes (CSP), hence allowing connection of two probes at a time. By ensuring compatibility with both generation probes, MIP 10 *Digital* allows a smooth transition for users who are using Nardeux probes and want to move to CSP probes.

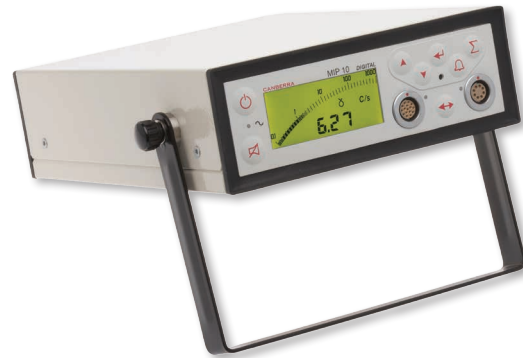
The MIP 10 *Digital* integrates rechargeable batteries to prevent any measurement outage when performing critical controls. The MIP 10 *Digital* is fully functional when disconnected from mains, allowing for remote work in field sites for up to 40 hours.

With its metal housing and rugged keyboard, MIP 10 *Digital* is built to resist harsh environment conditions like the original MIP 10. Its dimensions that are identical to MIP 10 make it compatible with accessories and allow it to be stacked with other MIP 10.

MIP 10 *Digital* brings new key features including a fast-reacting digital readout bargraph, customizable alarm set point per probe (or range of probe for Nardeux probes), with many measurement units: c/s, Bq<sub>eq</sub>, Bq<sub>eq</sub>/cm<sup>2</sup>, Sv/h, Sv<sub>eq</sub>/h (depending on CSP connected), and new Scaler/Timer mode with 1 to 1000 seconds acquisition time.

With CSP, key components of hardware circuitry (high voltage, amplifier, discriminator, etc.) are located directly inside the probe's housing rather than the host survey instrument. Also, the intelligence associated with controlling those components is located in the probe – that is, control and storage of key parameters, settings, calibrations, probe ID, alarm settings, etc. Thus the probe is a fully integrated subsystem, taking and transmitting the measurement to the instrument, which is used for display.

With high voltage and digitization of the data occurring in the probe rather



# MIP 10 *Digital* Desktop Dose Rate and Survey Meter



Figure 1: MIP 10 *Digital* front panel.

than the instrument, measurement quality is no longer dependent on cable quality as with older analog systems. Also, the probes can be plugged in “hot” without powering down the survey meter – the instrument immediately recognizes the probe and automatically switches measurement mode to the mode required for that specific probe. Calibrations and QA measurements can also be performed directly with the probe, without even using the instrument, by connecting the probe to a computer with calibration software, allowing the MIP 10 *Digital* to remain deployed in the field.

## FUNCTIONS

### Easy to Use

As soon as the MIP 10 *Digital* is powered on, it automatically detects the probe connected, and is ready for measurement. In case of multiple probes connected, the user can switch from one probe to the other using the toggle button. Two LEDs indicate which probe is the selected probe for measurement, preventing any handling mistake.

MIP 10 *Digital's* internal buzzer enables audio control of radioactive material by indicating the radioactivity level. It can be muted when the application requires it.

### Customizable Alarm

The alarm setpoint are accessible after entering an access code to prevent any accidental change. It can be set:

- For CSP probes: alarm set points are chosen individually for each probe within 10 preset values which can be changed with CSPS™ and with the appropriate USB cable; alarm setpoint is stored in the probe itself.
- For Nardeux probes: it is set by the user and stored in MIP 10 *Digital*.

### Power Supply and Battery Management

MIP 10 *Digital* includes a backup battery that allows usage away from any power source.

A power LED indicates if the MIP 10 *Digital* is powered by mains and battery is fully charged or if powered by mains and batteries is charging. Full charge cycle is less than 5 hours.

When the battery charge is low, the battery pictogram flashes on the LCD screen. If the battery level is too low the MIP 10 *Digital* automatically shuts down gracefully to prevent false measurement.

### A Ruggedized Survey Meter

MIP 10 *Digital* has been built to resist harsh environment constraints. Its robust metal housing ensures resistance to shock. Its silicon rubber keypad provides excellent tactile control, compression recovery, shock and vibration absorption and superior resistance to extreme heat and cold unlike classical keypads.

### An Integrated Scaler/Timer

MIP 10 *Digital* incorporates a Scaler/Timer mode which allows you to select the integration time between 1 s and 1000 s. Scaler/Timer mode is especially useful for measurements of low activity sources, or alpha measurements. The preset time varies between 1 and 1000 seconds.

It displays the average value on the selected period of time and gives the result in the pre-selected unit (c/s, Bq<sub>eq</sub>, Bq<sub>eq</sub>/cm<sup>2</sup>, Sv/h, or Sv<sub>eq</sub>/h).

### OPTIONS

MIP 10 *Digital* can be fixed on a pedestal for use as a control survey meter. For example, at exits of working areas. The MIP 10 *Digital* pedestal is 1 m (3.3 ft) high. It integrates a hook for probes. Its lead base ensures efficient stability.



Figure 2:  
MIP 10 *Digital* on its pedestal with  
CSP probe support (option).

# MIP 10 *Digital* Desktop Dose Rate and Survey Meter

## ALTERNATE PRODUCT

Avior is a single input version that connects to all CSP probes (see Avior documentation).

## Compatible Probes for MIP 10 *Digital*

All Nardeux probes not displayed here will require a MIP10/MIP21 adaptor cable, and will only display c/s.

|         | Name         | Emitter Displayed | Detector Size       | Units Displayed |                                   |                  |      |                     | Cable            |                      |                      |                     | Alarm setting <sup>1</sup> |
|---------|--------------|-------------------|---------------------|-----------------|-----------------------------------|------------------|------|---------------------|------------------|----------------------|----------------------|---------------------|----------------------------|
|         |              |                   |                     | c/s             | B <sub>req</sub> /cm <sup>2</sup> | B <sub>req</sub> | Sv/h | S <sub>req</sub> /h | Nardeux          |                      | CSP                  |                     |                            |
|         |              |                   |                     |                 |                                   |                  |      |                     | Coil Cable 18357 | Straight Cable 18603 | Straight 1.5 m 77336 | Straight 20 m 80653 |                            |
| CSP     | SG 1R        | γ, X              | 1" Ø x 1"           | •               |                                   |                  |      | •                   |                  |                      | •                    | •                   | P                          |
|         | SG 2R        | γ, X              | 2" Ø x 2"           | •               |                                   |                  |      | •                   |                  |                      | •                    | •                   | P                          |
|         | SAB 100      | α, β              | 100 cm <sup>2</sup> | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
|         | SA 100       | α                 | 100 cm <sup>2</sup> | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
|         | SB 100       | β                 | 100 cm <sup>2</sup> | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
|         | SA 20        | α                 | 20 cm <sup>2</sup>  | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
|         | SB 20        | β                 | 20 cm <sup>2</sup>  | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
|         | SX 2R        | X                 | 1.5" Ø x 3 mm       | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
|         | SPAB 15      | α, β              | 15 cm <sup>2</sup>  | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
| Other   | SFDE         | γ                 | Dose rate           |                 |                                   |                  |      | •                   |                  |                      | •                    | •                   | A                          |
|         | SHDE         | γ                 | Dose rate           |                 |                                   |                  |      | •                   |                  |                      | •                    | •                   | A                          |
|         | STHF-R       | γ                 | Dose rate           |                 |                                   |                  |      | •                   |                  |                      | cf. <sup>2</sup>     |                     | A                          |
|         | STHD         | γ                 | Dose rate           |                 |                                   |                  |      | •                   |                  |                      | •                    | •                   | A                          |
|         | SABG 15      | α, β, γ           | 15 cm <sup>2</sup>  | •               | •                                 | •                |      |                     |                  |                      | •                    | •                   | P                          |
|         | SB29         | α, β, γ           | 6 cm <sup>2</sup>   | •               |                                   |                  |      |                     |                  |                      | •                    | •                   | A                          |
| Nardeux | SAB 70       | α, β              | 70 cm <sup>2</sup>  | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SA 70-2      | α                 | 70 cm <sup>2</sup>  | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SAP 400      | α                 | 400 cm <sup>2</sup> | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SBM          | β                 | 6 cm <sup>2</sup>   | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SBM-2D       | β                 | 30 cm <sup>2</sup>  | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SBG          | β, γ              | 18 cm <sup>2</sup>  | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SG-2         | γ                 | 8 cm <sup>2</sup>   | •               |                                   |                  |      |                     | •                | •                    |                      |                     | A                          |
|         | SB 70-2      | β                 | 70 cm <sup>2</sup>  | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SX-2         | X                 | 8 cm <sup>2</sup>   | •               | •                                 | •                |      |                     | •                | •                    |                      |                     | A                          |
|         | SPBM         | –                 | 150 cm <sup>2</sup> | •               |                                   |                  |      |                     | •                | •                    |                      |                     | C                          |
|         | SABP         | –                 | 18 cm <sup>2</sup>  | •               |                                   |                  |      |                     | •                | •                    |                      |                     | C                          |
|         | SPA 525-2/30 | –                 | 525 cm <sup>2</sup> | •               |                                   |                  |      |                     |                  | •                    |                      |                     | C                          |
|         | SBS          | –                 | 75 cm <sup>2</sup>  | •               |                                   |                  |      |                     |                  | •                    |                      |                     | C                          |

<sup>1</sup> P = Alarm value set per probe, stored in MIP 10 *Digital*.

I = Individual alarm value per probe chosen among 10 predefined values, stored in the probe.

<sup>2</sup> For STHF-R, cable provided with probe connects directly to CSP input; STHF requires adaptor EM39987.

Non-exhaustive list of CSP compatible probes.

# MIP 10 *Digital* Desktop Dose Rate and Survey Meter

## Specifications

### NUCLEAR

- UNITS DISPLAYED (depending on probe) – c/s, Bq<sub>eq</sub>, Sv/h, Bq<sub>eq</sub>/cm<sup>2</sup>, Sv<sub>eq</sub>/h.
- ALARM THRESHOLD –
  - CSP Probes – 10 values for each unit to display, stored in probe memory. Each value is editable via PC setup software.
  - Nardeux Probes – One value stored in MIP 10 *Digital*, customized by user with keypad.

### RESPONSE TIME

- As fast as 1/4 s for bargraph display depending on probe connector, on a four decades semi-logarithmic scale.
- 1 s for digital readout display.

### ERGONOMIC

- DISPLAY – Large LCD display with constant backlight.
- Alarm –
  - Audible piezoelectric buzzer modulated sound.
  - Visual – Flashing alarm pictogram.
- KEYBOARD – Ruggedized keyboard with 8 buttons: power, audio mute, probe selector, up, down, enter, alarm mode, integration mode.
- OPERATING CONTROLS – Complete and automatic self test when switching on. Periodical control of main functions when in use.

### ELECTRICAL

- Buffer rechargeable batteries (NiMH type).
- Built-in charger.
- Universal Mains power input, 100-240 V ac, 50/60 Hz. Rear-panel IEC-type connector. Cordset included.
- Display of remaining charge when switching on; permanent test of voltage, display of 'low battery' pictogram when battery life is <10%.
- BATTERY LIFE – >40 h with CSP probes; >15 h with Nardeux probes.

### MECHANICAL

- HOUSING – Metal frame and painted duralumin covers.
- WEIGHT – 1800 g (4 lb).
- DIMENSIONS – 62 x 213 x 225 mm (L x W x H).
- CONNECTOR FOR EXTERNAL PROBES –
  - SOV 104 A086-160 Fisher socket (Nardeux).
  - S 104 A066 137+ Fisher socket (CSP).

### ENVIRONMENTAL

- OPERATING TEMPERATURE LIMIT – -10 °C to +50 °C.
- STORAGE TEMPERATURE – -25 °C to +60 °C.
- INGRESS PROTECTION – IP 40.

### NORM

- 2004/108/CE Electromagnetic Compatibility.
- 72/23/EEC – Low voltage.
- Built to meet IEC 60325-2006 and 60846-2002 Radiation instrumentation standards.

### ORDERING REFERENCES

- MIP 10 *Digital* – EM83021.
- Pedestal for MIP 10 *Digital* – EM18364.
- CSP Probe Support for Pedestal – EM86510.
- Carrying Bag for MIP 10 *Digital* – EM18310.

### Nardeux Probes:

- Coil Cable – EM18357.
- Straight Cable – EM18603.
- Adaptor MIP10/MIP21 – EM18475.

### CSP Probes:

- Cable (CSP, 1.5 m length) – EM77336.
- Cable (CSP, 10 m length) – EM85920.
- Cable (CSP, 20 m length) – EM86153.
- CSPS-E (CSP Software – English) – EM80643.
- CSPS-F (CSP Software – French) – EM78468.
- PC/Meter Cable – EM88940.
- STHF Probe Cable Adaptor – EM39987.
- PNK-R 900 Pancake Dongle – EM83118.



CSP and CSPS are trademarks and/or registered trademarks of Mirion Technologies, Inc. and/or its affiliates in the United States and/or other countries.

All other trademarks are the property of their respective owners.

©2017 Mirion Technologies (Canberra), Inc. All rights reserved.

Copyright ©2017 Mirion Technologies, Inc. or its affiliates. All rights reserved. Mirion, the Mirion logo, and other trade names of Mirion products listed herein are registered trademarks or trademarks of Mirion Technologies, Inc. or its affiliates in the United States and other countries. Third party trademarks mentioned are the property of their respective owners.

# CANBERRA