

# Personal Monitor Tester

*Reference field generator for RF personal exposure monitors*

**Model SSC100** | by SStep Technologies

## AT A GLANCE

First-of-its-kind reference instrument for the periodic verification and calibration of RF personal exposure monitors (electromagnetic field dosimeters). The SSC100 generates a controlled, calibrated field strength at the position of the device under test, allowing operators to confirm that each measurement step of the personal monitor matches its declared value within tolerance — in line with the duty-cycle limits required by current occupational EMF safety regulations.



*SSC100 with personal monitor in calibration position*



*Top panel: dedicated cradle and radiating element*

## Application & purpose

The SSC100 is the first instrument purpose-built to verify, on a routine basis, that an RF personal exposure monitor still reads the field strength it claims to read. By generating a known, calibrated electromagnetic field at the precise position of the device under test, the SSC100 lets the operator step through every alarm threshold of the personal monitor and confirm that each one triggers correctly within tolerance.

Each emission step has a duration consistent with the duty-cycle constraints set by current occupational EMF safety regulations, so that the verification procedure itself remains within safe exposure limits for the operator and bystanders.

## Regulatory context

- Directive 2013/35/EU — minimum health and safety requirements for the exposure of workers to electromagnetic fields
- Italy: D.Lgs 81/08, Title VIII Chapter IV — implementation of 2013/35/EU
- ICNIRP Guidelines (2020) — limits for exposure to time-varying electric, magnetic and electromagnetic fields

## Key features

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### Targeted by design

Factory-tuned profiles for Microrad EME Guard XS and AM40C personal monitors. Custom profiles for additional dosimeter models can be defined.

### Field strength accuracy $\pm 1$ dB

Calibrated field strength at the device-under-test position, verified at 25 °C across all preset steps.

### 7" TFT touch interface

Profile selection, gear setup, manual and automatic operation directly from the front panel. Quick  $\pm 1$  dB ( $\approx 12$  % field strength) trim keys for fine adjustment.

### Built-in safety logic

Automatic emission cutoff at 1 minute (manual mode) and 7 minutes at full scale (alarm). Operator must remain at least 1 m from the calibrator during emission.

### CW reference signal at 200 MHz

Standard operating frequency suitable for all common RF personal monitors. The frequency can optionally be modified for specific test requirements.

### Dual range: standard and optional

Standard range 7–61 V/m covers most occupational action levels; optional range 122–350 V/m extends coverage for high-exposure scenarios.

### Two operating modes

Manual: continuous emission of a fixed selected step. Auto: timed sequence through all steps of the active profile, ideal for end-to-end verification.

### Dedicated holder for repeatable positioning

Mechanical fixture keeps the personal monitor under test in the exact position relative to the radiating element, ensuring reproducible field exposure across calibrations.

## How it works

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The SSC100 emits a continuous-wave RF signal at the calibration frequency (200 MHz standard) through a radiating element integrated into the upper panel. The personal monitor under test is positioned in a dedicated mechanical holder that ensures repeatable, reproducible distance and orientation between the radiating element and the sensor of the dosimeter.

The operator selects the active profile (e.g. EME Guard XS or AM40C) on the 7" touch screen, then runs through the seven calibrated field strength steps — either one at a time in Manual mode, or as a timed sequence in Auto mode. At each step, the personal monitor under test is expected to display the corresponding field value within its own measurement tolerance. Steps that read outside tolerance reveal a unit that has drifted and needs adjustment or service.

All emission steps respect a built-in maximum duration (1 minute in manual debug, 7 minutes at full scale with audible alarm) so that the verification procedure itself remains compliant with the occupational exposure limits set by the relevant regulations.

## Calibrated field strength steps

Each profile defines seven calibrated field strength steps, factory-set for the targeted personal monitor. All steps are guaranteed at  $\pm 1$  dB at the device-under-test position. Intermediate step values are profile-dependent and are documented in the unit's calibration certificate.

| Step | Standard range (V/m) | Optional range (V/m) | Tolerance  |
|------|----------------------|----------------------|------------|
| 1    | 7 V/m                | 122 V/m              | $\pm 1$ dB |
| 2    | —                    | —                    | $\pm 1$ dB |
| 3    | —                    | —                    | $\pm 1$ dB |
| 4    | —                    | —                    | $\pm 1$ dB |
| 5    | —                    | —                    | $\pm 1$ dB |
| 6    | —                    | —                    | $\pm 1$ dB |
| 7    | 61 V/m               | 350 V/m              | $\pm 1$ dB |

## Technical specifications

|                                 |                                                                                            |
|---------------------------------|--------------------------------------------------------------------------------------------|
| Operating frequency             | 200 MHz standard; configurable up to <1 GHz for custom profiles                            |
| Signal type                     | CW (continuous wave, unmodulated)                                                          |
| Field strength range — standard | 7 V/m to 61 V/m, in 7 calibrated steps                                                     |
| Field strength range — optional | 122 V/m to 350 V/m, in 7 calibrated steps                                                  |
| Field strength accuracy         | $\pm 1$ dB at 25 °C, at the DUT position                                                   |
| Internal attenuator             | 0–50 dB (amplifier OFF) / 10–50 dB (amplifier ON), 0.5 dB step                             |
| Operating modes                 | Manual (fixed level) / Auto (timed step sequence with configurable dwell)                  |
| Quick trim                      | $\pm 1$ dB ( $\approx 12$ % field strength) per-step trim keys, auto-reset on step change  |
| Safety timers                   | 1 min auto-stop in manual debug; 7 min cutoff at full scale in transmit                    |
| Display                         | 7" TFT colour touch screen                                                                 |
| Communication interface         | [ TO BE CONFIRMED — USB and/or Ethernet (TCP/IP, port 9527) for SSC100CtrlUI PC software ] |
| Power supply                    | External 12 V / 2 A AC adapter (included)                                                  |
| Operating temperature           | –10 °C to +40 °C                                                                           |
| Dimensions (W × D × H)          | 200 × 150 × 120 mm                                                                         |
| Weight                          | 1.3 kg                                                                                     |
| Supported personal monitors     | Microrad EME Guard XS, Microrad AM40C (others on request)                                  |

## Supported personal monitors

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The SSC100 is shipped pre-configured for the most common Microrad RF personal monitors. Each supported model is paired with a dedicated mechanical holder that locks the device under test into the calibrated test position. Profiles for additional dosimeter models can be defined on request.



*Dedicated calibration fixture*



*Personal monitor secured on the fixture (side view)*

## Operating modes

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### Manual mode

Continuous emission of a single, operator-selected field strength step. Useful for spot checks and for fine-tuning the response of a single threshold. The signal stops automatically after the configured Auto-Stop time.

### Auto mode

The instrument cycles automatically through all seven steps of the active profile, holding each step for a configurable dwell time (default  $\geq 3$  s). This is the fastest way to verify, in a single run, that every alarm threshold of the personal monitor responds correctly.

## Safety

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- Maintain a minimum operator distance of 1 m from the calibrator during emission.
- Do not operate the SSC100 inside areas of pre-existing high-power RF radiation.
- Built-in 7-minute cutoff at full scale prevents unintentional over-exposure.
- Audible alarm signals the cutoff condition.

## In the box

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- SSC100 Personal Monitor Tester main unit
- Dedicated holder(s) for the ordered personal monitor model(s)
- 12 V / 2 A external power adapter
- Calibration certificate
- Quick-start guide
- SSC100CtrlUI PC software (download)

## Ordering information

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|                |                                                              |
|----------------|--------------------------------------------------------------|
| SSC100-STD     | Personal Monitor Tester, standard range 7–61 V/m             |
| SSC100-EXT     | Personal Monitor Tester, optional extended range 122–350 V/m |
| SSC100-FIX-XS  | Holder for Microrad EME Guard XS                             |
| SSC100-FIX-40C | Holder for Microrad AM40C                                    |

*Order codes shown for reference. Please contact DMG Communication for confirmed part numbers, lead time and pricing.*

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