

# SRS *T* series



## Soil Respiration Systems for the field



## SRS1000 *T* and SRS2000 *T*

Soil respiration systems designed for field portability

Determine Net Carbon Exchange Rate

Instant, touch screen data entry

Measure water vapour flux

Colour, real time graphing

360° screen visibility

GPS



## Designed for field use

### Portable and reliable

Both the **SRS1000 T** and **SRS2000 T** can be comfortably carried either in the hard shell case, or whilst wearing on a shoulder/waist strap. Designed for prolonged, reliable operation in harsh field conditions, both systems maintain optimal performance even in highly humid and dusty climates.

### Reliable battery life

Powered by a 12V rechargeable battery and incorporating the latest in low power consumption components, the **SRS1000 T** will function continuously for up to 10 hours on a single charge, whilst **SRS2000 T** will operate for up to 16 hours on a full charge.

### GPS to pinpoint your data

Both systems are fitted with a GPS unit to record the exact position of every measurement taken when outdoors. Latitude, longitude and altitude data are all recorded, displayed on a GPS menu screen, and integrated into the data file for review upon download of data.

## Expert measurement technique

Since 1969, ADC have been world leaders in the design and manufacture of infrared gas analysers (IRGAs). We have consistently advocated the **open mode** of analysis, whereby a constant flow of air and ambient pressure are maintained throughout the sample chamber.

The **SRS1000 T** and **SRS2000 T** carry out an **automatic zero** with every operational cycle, ensuring long-term measurement stability. In both systems, an expertly crafted, single **IRGA** is positioned directly adjacent to the soil chamber. This ensures accurate, fast and stable CO<sub>2</sub> flux analysis.

Gas flow rates to the specialised soil chamber are controlled from the **SRS1000 T** or **SRS2000 T** console, at an optimum range of 68 to 340m<sup>-2</sup> sec<sup>-1</sup>.

### High quality sensors

The soil chamber encloses two, laser-trimmed humidity sensors to provide exceptionally accurate *Wflux* data, and high calibre sensors to measure light above the soil (Q) and soil temperature.

### Chamber climate control with **SRS2000 T**

- Elevation of CO<sub>2</sub> within the chamber up to 2000ppm
- Control of CO<sub>2</sub> 'below ambient' within the chamber
- Humidity control, i.e. wetting chamber inlet air using iron sulfate (within the detachable column)

## Taking measurements

Install the soil collar(s) and allow surrounding soil to settle for around 12 hours, ideally overnight.

Lock the upper soil chamber in place and set up your SRS on site.

By viewing the display, allow gas readings to stabilise. Easily adjust chamber climate factors as relevant.

Record a measurement using either the record button, the record key on the display, or set automatic, timed logging, to a named data file.

Measurements are now safely stored.

1000s of measurements can be stored on the SD card and transferred to your PC.

Remove the upper chamber and leave the collar in place if you wish to return to this site, or move on to another, pre-installed collar.



## Discover the Applications

### Spatial and Temporal Soil CO<sub>2</sub> flux

Our soil respiration systems facilitate both spatial and temporal studies over a field site, or multiple sites.

#### Soil respiration measurement

Both systems are fitted with a high quality, robust soil chamber, comprising an upper compartment and a detachable, lower collar. A pressure release valve in the upper compartment ensures accurate field soil flux measurements, by minimising any potential pressure gradients and by being insensitive to wind. The chamber volume is 1L.

Additional soil collars allow researchers to rapidly perform multiple soil flux measurements over a large site. Each collar is used to define a separate analysis area. These stainless steel collars can be left in the soil, enabling temporal studies to be performed.

Both systems are auto-configured to measure, display, calculate and record soil respiration parameters:

Water vapour flux  $W_{\text{flux}}$  is calculated in  $\text{m mol s}^{-1} \text{m}^{-2}$

Soil respiration  $C_e$  is calculated as the net molar flow of CO<sub>2</sub> in/out of soil ( $\mu\text{mol s}^{-1}$ )

The  $C_e$  per unit area is used in the calculation of NCER ( $\mu\text{mol s}^{-1} \text{m}^{-2}$ )



#### Adaptors for Soil Chambers

Adaptors are available for 6" / 160mm (left) and 4" / 110mm (top right) to fit the soil collar directly onto PVC piping. Additional collars for deeper soils (lower right) are also available to fit soil collars. A sealing base is also available to contain samples within any depth of chamber.



#### NEW: Versatile Chamber

Two-part chamber allowing maximum light through to the sample area. The versatile chamber can be used over soil and/or small, whole photosynthetic organisms. This chamber has been used for the measurement of microalgal gas exchange in the Antarctic (Davey, M.P. Cambridge University, UK). Plants can also be grown in the sealed pot, or the lower collar can be embedded into growth.

#### Soil Temperature Probe

A soil temperature probe is supplied with both systems.

The probe can be positioned by hand, once connected to the chamber handle.

A direct read-out of "Tsoil" as measured by the probe, is then available.

This parameter can be plotted against NCER or  $C_e$  in real time on the colour graphic display.





For the investigation of plant, soil and atmospheric interactions, ADC BioScientific Ltd. expertly produce a wide range of portable, user-friendly and cost-effective devices, from photosynthesis to soil respiration systems.

We are committed to enabling carbon cycle research worldwide through quality instrumentation and local, technical support.

ADC BioScientific Ltd. also supply:  
 Portable Photosynthesis Systems, Leaf Area Meters, Chlorophyll Content Meters, Advanced Fluorometers, Automated Soil CO<sub>2</sub> Exchange Systems and Field Gas Analysers.

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## SRS Technical Specifications

<b>Gas Exchange CO<sub>2</sub>:</b>	<b>SRS1000 T</b> 0-2000ppm <b>SRS2000 T</b> 0-3000ppm 1ppm resolution Infrared gas analysis; differential open system, auto zero, automatic atmospheric pressure and temperature compensation
<b>H<sub>2</sub>O:</b>	0-75mbar, 0.1mbar resolution Two laser-trimmed, fast response water vapour sensors
<b>PAR:</b>	0-3000µmol m <sup>-2</sup> sec <sup>-1</sup> Silicon photocell
<b>Soil Temperature:</b>	-5°C to 50°C Manually positioned soil thermistor probe

### Automated environmental control

**SRS2000 T only:** Internal LC*pro* T menu driven software. Automatic and independent control of environmental conditions within the leaf chamber. For automatic response curves, sequential control levels and dwell times may be set.

**CO<sub>2</sub>:** Up to 2000ppm CO<sub>2</sub> by integral elevated CO<sub>2</sub> supply system

**H<sub>2</sub>O:** Above and below ambient (dependent on ambient conditions), by on-board self-indicating conditioning chemicals

**Flow rate to soil chamber:** 68 to 340µmol m<sup>-2</sup> sec<sup>-1</sup>

**Gas connections:** 3mm barbed

**Warm up time:** 5 minutes @ 20°C

**Display:** Colour WQVGA touch sensitive LCD

**Recorded Data:** Removable SD cards. 32Gb supported.

#### Battery:

**SRS1000 T:** 2.8Ah 12V lead acid battery  
 Up to 10 hours between charges

**SRS2000 T:** 7.5Ah 12V Lithium-ion battery  
 Up to 16 hours between charges

**Battery Charger:** Universal input voltage 13.8V output

**Electrical Outputs:** Mini-B

**USB connection:** Function as a mass storage device

**RS232 output:** 9 Pin "D" type  
 User-selectable rates of up to 230400 baud for computer or printer connection

**Operating temperature range:** 5°C to 45°C

**Dimensions W X D X H of console:** **SRS1000 T** 125 x 140 x 240mm  
**SRS2000 T** 230 x 110 x 170mm

**Weight of Console:** **SRS1000 T** 2.4kg  
**SRS2000 T** 4.1kg

**Soil Chamber Construction:** Stainless steel collar, cast Acrylic upper  
**Volume:** 1L  
**Diameter:** 130mm  
**Height:** Collar 75mm, Upper chamber 70mm  
**Weight:** Collar 325g, Upper chamber 320g

ADC BioScientific Ltd. retain the right to change any specification as part of their continual product development.

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