Fast Field Cycling NMR Relaxometry is a powerful technique for investigation of the molecular dynamics in a variety of systems: it is the only technique which permits the measurement of spin relaxation times over a wide range of magnetic field strengths (from a few kHz up to the maximum field allowed by the hardware of the instrument*), and thus is distinguished in the information it provides with respect to fixed field magnets. The data obtained from this technique can be correlated to the physical/chemical properties of complex materials and there are proven advantages of working at low magnetic field strengths. Applications of FFC NMR Relaxometry are evolving from their pure research origins towards solving more practical industrial problems, in diverse sectors ranging from pharmaceuticals and foods through to polymers and rocks.

* Up to 10 MHz with SMARtracer™, 40 MHz with SPINMASTER and 125 MHz in combination with the 3T HTS-110 superconducting magnet for high-field relaxometry

** SPINMASTER FFC2000 1T C/DC **

1 Tesla research grade Fast Field Cycling NMR Relaxometer

SPINMASTER FFC2000 1T C/DC is a unique NMR instrument designed to measure the field dependence of the NMR spin-lattice and spin-spin relaxation times, T₁ and T₂** (known as Nuclear Magnetic Relaxation Dispersion — NMRD profiles).

The SPINMASTER 1 Tesla system allows measurement of NMRD profiles from a few kHz to a maximum operating magnetic field of 42.6 MHz (¹H Larmor frequency) and is capable of multi-nuclear measurements (¹H, ¹³C, ³¹P, ²³Na, etc.).

SPINMASTER offers superb performance for numerous applications where investigation of molecular dynamics may provide the key to solving problems for which other analytical techniques cannot provide answers.

** SMARtracer™ **

0.25 Tesla Bench-top Fast Field Cycling NMR Relaxometer

SMARtracer™ is an innovative, cost-effective, Fast Field Cycling NMR instrument designed to measure magnetic relaxation (T₁ and T₂**) as a function of magnetic field strength.

The SMARtracer™ 0.25 Tesla system allows measurement of NMRD profiles from 10kHz to 10 MHz (¹H Larmor frequency) and is capable of multi-nuclear measurements**.

SMARtracer™ is the ideal instrument to exploit the high quantity of information contained in the NMRD profiles acquired by means of Fast Field Cycling NMR relaxometry techniques, in clinical and industrial applications.

SPINMASTER 1 T system and SMARtracer™ 0.25 T system features:

- Measurement of relaxation times from a fraction of a millisecond to several seconds
- Multi-nuclear operations
- Fully automated acquisition of NMRD profiles
- Efficient and accurate temperature control (range from -140 °C to +140 °C with a 0.1 °C resolution)
- Minimum operating costs (no cryogenic gases necessary)
- No complicated sample preparation required
- Measures solids, liquids, liquid crystals, colloids, complex mixtures

** depending on conditions: for more details please contact Stelar
**PC-NMR**

The Personal NMR Console

PC-NMR is the Stelar high performance, general purpose, portable NMR console. It is available in two formats: a 19" rack version or portable aluminium case version.

Its innovative design provides a single and powerful “plug-and-go” solution for most NMR, NMR Fast Field Cycling, Diffusion NMR and NQR experiments, as well as mobile NMR.

**Main features include:**
- Direct digital signal detection from 500 kHz up to 80 MHz (optional up to 130 MHz).
- Three independent RF TX channels programmable from DC to 80 MHz (optional from DC to 130 MHz).
- Data accumulation in four separate buffers (real and imaginary parts, phase and absolute value of the signal).
- 250 W / 500 kHz - 130 MHz RF linear RF power pulse amplifier.
- RF FRONT-END composed of: one H-range broad-band low-noise short dead-time preamplifier from 0.5 – 200 MHz (optional 5–400 MHz); one TX/RX coupling and probe tuning device on computer screen.
- S/NMR32/FFC: AcqNMR32 Windows-compatible software package, for NMR-NMRD data acquisition, display and evaluation of MR and FFC - NMRD profiles. All experimental procedures are supported.

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**High Field NMR Relaxometry**

HTS-110

Combining a 3 Tesla cryogen-free superconducting magnet with either SPINMASTER or SMARTracer™ allows extension of the magnetic field strength range for the acquisition of NMRD profiles to the range of the latest high field clinical MRI scanner. The combined systems are ideal for studying relaxivity of MRI contrast agents.

The system has been developed in collaboration with HTS-110, the leading company in the design of high temperature superconducting magnetic solutions.

**Main features include:**
- FULL INTEGRATION AND COMPATIBILITY with Stelar SPINMASTER or SMARTracer™ systems
- Variable field from 0 to 3 Tesla
- Allows measurement of spin relaxation times up to 125 MHz
- Cryogen-free operation
- High uniformity over the whole excitation range
- Large 25 mm pole gap
- Low fringe magnetic field
- Magnet safety monitoring electronics included
- Reliable mechanical cooling
- Compact size