Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:
- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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The FS725 integrates a rubidium oscillator (SRS model PRS10), a low-noise AC power supply, and distribution amplifiers in a compact, half-width 2U chassis. It provides stable and reliable performance with an estimated 20 year aging of less than $5 \times 10^{-9}$, and a demonstrated rubidium oscillator MTBF of over 200,000 hours. The FS725 is an ideal instrument for calibration and R&D laboratories, or any application requiring a precision frequency standard.

There are two 10 MHz and one 5 MHz outputs with exceptionally low phase noise ($-130$ dBc/Hz at 10 Hz) and one second Allan variance ($<2 \times 10^{-11}$). The FS725 can be phase-locked to an external 1 pps reference (like GPS) providing Stratum 1 performance. A 1 pps output is also provided that has less than 1 ns of jitter, and may be set with 1 ns resolution.

Up to three internal distribution modules can be added to the FS725. Each module has four 10 MHz outputs, one 5 MHz output, and one 1 pps output, all with the same low phase noise, harmonic distortion and jitter.

An RS-232 interface allows direct communication with the rubidium oscillator. Using the provided Windows software, you can easily monitor and control 1 pps timing, and determine the instrument's operational status.

There are two alarm relays that indicate the status of the rubidium oscillator lock state and synchronization to an external 1pps input. The relays are SPDT, providing both normally-open and normally-closed contacts.
Output

Output frequencies 10 MHz sine, 5 MHz sine, 10 µs wide 1 pps pulse
Amplitude 0.5 Vrms, ±10 %
1 pps pulse amplitude 2.5 V into 50 Ω, 5 V into High-Z loads
Phase noise (SSB) <−130 dBc/Hz (10 Hz), <−140 dBc/Hz (100 Hz), <−150 dBc/Hz (1 kHz), <−155 dBc/Hz (10 kHz)

Spurious <−100 dBc (100 kHz BW)
Harmonics <−60 dBc
Accuracy at shipment ±5 × 10⁻¹¹ (monthly), <5 × 10⁻¹⁰ (yearly)
Aging (after 30 days) <5 × 10⁻⁹ (20 years, typ.)
Short-term stability <2 × 10⁻¹¹ (1 s)
(Allan variance) <1 × 10⁻¹¹ (10 s), <2 × 10⁻¹² (100 s)
Holdover 72 hour Stratum 1 level (1 × 10⁻¹¹)
Frequency retrace ±5 × 10⁻¹¹ (72 hrs. off, then 72 hrs. on)
Settability <5 × 10⁻¹²
Trim range ±2 × 10⁻⁶ (0 to 5 VDC), ±0.5 ppm (via RS-232)
Warm-up time <6 minutes (time to lock), <7 minutes (time to 1 × 10⁻⁹)

Front-Panel Indicators (Green LEDs)

Power “On” when AC power is applied
Locked “On” when frequency is locked to Rb
1 pps input Blinks with each 1 pps reference input applied to rear panel
1 pps sync “On” when 1 pps output is synchronized within ±1 µs of 1pps input
Receive Blinks when RS-232 characters are received by FS725
Send Blinks when RS-232 characters are sent by FS725

Rear-Panel Connections

Frequency adjust 0 to 5 VDC adjusts frequency by ±0.002 ppm (normally unconnected)
1 pps input One 100 kΩ input. Requires CMOS level pulses (0 to 5 VDC). If an external 1 pps input is applied, lock

Environmental

Operating temperature +10 °C to +40 °C
Temperature stability ∆T < ±1 × 10⁻¹⁰ (+10 °C to +40 °C)
Storage temperature −55 °C to +85 °C
Magnetic field ∆f/f < 2 × 10⁻¹⁰ for 1 Gauss field reversal
Relative humidity 95 % (non-condensing)

General

AC power 90 to 132 VAC or 175 to 264 VAC, 47 to 63 Hz, 50 W
Dimensions, weight 8.5” x 3.5” x 13” (WHL), 9 lbs.
Warranty One year parts and labor on defects in materials and workmanship

Ordering Information

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<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>FS725</td>
<td>Benchtop Rb frequency standard</td>
<td>$2495</td>
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<tr>
<td>Option 01</td>
<td>Distribution amplifier (6 outputs)</td>
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<tr>
<td>Option 02</td>
<td>Distribution amplifier (12 outputs)</td>
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<td>Option 03</td>
<td>Distribution amplifier (18 outputs)</td>
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<td>O725RMD</td>
<td>Double rack mount kit</td>
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<tr>
<td>O725RMS</td>
<td>Single rack mount kit</td>
<td>$85</td>
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</table>

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