

# **SPECIFICATION**

**Specification for the Supply of RF Power Meters for  
CLARA at Daresbury Laboratory**

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## **1. INTRODUCTION**

### **1.1. STFC**

Contracts will be awarded by the UK Shared Business Services Limited (UKSBS), acting for and on behalf of the Science and Technology Facilities Council (STFC). All contractual issues will be managed by SBS with technical issues being the responsibility of the Accelerator Science and Technology Centre (ASTeC) at Daresbury Laboratory.

### **1.2. RF Power Meter Requirements**

STFC requires a number of RF power meters and power head sensors for use on the RF systems on the CLARA and VELA facilities which are capable of performing peak and average RF power measurements.

### **1.3. Specification Abstract**

This specification concerns the delivery to Daresbury Laboratory, of 7 RF power meters and 14 power head sensors CLARA and VELA RF systems.

## **2. GENERAL CONDITIONS**

### **2.1 Scope of Contract**

2.1.1. The contract will cover the delivery of 7 RF power meters and 14 power head sensors for the CLARA and VELA facilities at STFC Daresbury Laboratory (hereinafter referred to as STFC), Warrington.

2.1.2. The contractor will be required to co-operate closely with STFC and its authorised representative at all stages of the contract. Final design schemes and technical issues will be resolved after adequate discussion.

2.1.3. The provision of RF power to the RF cavities has been determined by STFC and is described within this document.

2.1.4. The manufacturer will be responsible for any departure from anticipated performance due to the failure to adhere to any part of this specification.

2.1.5. No change to the specified requirements is permitted without the written permission of STFC. However, if at any stage of the contract it is clear that advantage could be gained by such modification then the manufacturer is encouraged to bring it to the attention of STFC.

### **2.2. Price and Payment Schedule**

2.2.1. The price for the power meters and power heads is to be clearly defined within the bid.

2.2.2. STFC urge tenderers to indicate acceptance of STFC payment terms. However, STFC are prepared to consider alternative payment terms, which should be clearly proposed in the tender documents for possible negotiation in the event of a successful bid.

2.2.3. The payment schedule should also be clearly defined within the bid.

### **2.3. Timescales and Delivery**

2.3.1. Timescales for the project are very important. It is envisaged that the contract will be placed at the beginning of February 2016 and the bidder should provide the best indication of delivery on this date. It should be noted that a preferred delivery date would be the end of March 2016.

2.3.2. No change may be made to the agreed programme without the written approval of SBS. SBS must be contacted immediately of any circumstances which might prevent the contract delivery date from being met.

### 3. RF Power Meter Requirements

#### 3.1. Description of Requirement

3.1.1. The RF measurement capabilities for the peak power meters and power heads are defined in the table below: \_

**Table 1:-** Power meter and power head requirements

<i><b>Parameter</b></i>	<i><b>Value / Requirement</b></i>	<i><b>Notes</b></i>
Measurement Functions		See 3.2
RF Channels	2	4 would be better
Frequency	Up to 6 GHz	Up to 9 GHz would be preferable
Peak power range	-50 to +20 dBm	
CW power range	-60 to +30 dBm	
Accuracy: Vertical Time Base	0.01% 0.01%	
External trigger	Required	Specify minimum trigger pulse width and maximum trigger rate
Calibration	Internal	See 3.3
Calibration dynamic range	-50 to +20 dBm	
Marker capabilities	2 vertical and 2 horizontal	
Triggering		See 3.4
External Interface	Required	See 3.5
Remote control		See 3.5
Warranty	> 12 months	See 3.6

#### 3.2. Measurement Functions

The power meter and power sensor head must be capable of measuring:-

- Peak power
- Average power
- Pulse width
- Pulse rise and fall times
- Pulse period
- Pulse repetition rate
- Pulse duty cycle

#### 3.3. Calibration

The power meters and power sensor heads are to be routinely operated on a daily basis, with measurements being regularly recorded throughout the day. The requirements for routine calibration need to be kept to a minimum. It should be confirmed in your bid the minimum timescale for routine calibration, and it should be defined how this is achieved.

### **3.4. Triggering**

3.4.1. The trigger modes that are to be provided are:-

- Normal
- Auto
- Auto peak to peak
- Free run

3.4.2. The power meter must be able to trigger internally on any of the channels and must have the ability to trigger externally.

### **3.5. External Interface and Remote Control**

3.5.1. Measurements are to be performed remotely, so the power meter must have the capability of providing readings via an EPICS control system and should have the capability of displaying the pulse profile.

3.5.2. It would be preferable to be able to control the functions of the power meter settings remotely. This would be done via the CLARA and VELA EPICS system.

### **3.6. Warranty**

3.6.1. The terms of the warranty, which the manufacturer proposes to apply should be stated in the tender. The manufacturer must guarantee the equipment against failure due to either faulty components or manufacture. The minimum expected warranty will be twelve months from the delivery of the equipment. Please confirm in your bid, but note that a longer warranty would be advantageous

3.6.2. Any other warranty statements that apply as part of the tender should be clearly defined within the tender documentation.

## **Appendix A – Information to be provided with the tender bid**

1. The tenderer may submit a number of options within their bid. Each option should clearly define what is included within their bid, and if necessary should state what is not included within the bid for clarity. Any caveats should be clearly defined within the tender documents.
2. The tenderer should provide price and delivery and within their bid provide a breakdown of all major items.
3. The tenderer must consider each clause of the specification in turn, and must clearly indicate whether they comply or do not comply with that clause. It is also recommended that where appropriate for clarity that explanation and evidence is provided for clauses that are acceptable.
4. The tenderer is invited to comment on any aspect of the design and to identify possible modifications that could lead to either improved quality or reduced cost (without compromising the performance specification).
5. Please confirm in your bid price including delivery to STFC Daresbury Laboratory.