



## Request for Quotation (RFQ) for the supply of test target generator (TTG) systems to the CSIR

**RFQ 5252/30/06/2017**

Date of issue:	15 June 2017
Closing Date and Time:	30 June 2017
Contact details	For submission of quotations or any other enquiries: <a href="mailto:tender@csir.co.za">tender@csir.co.za</a> Tel no:012 841 2400

### 1 INVITATION FOR QUOTATION

Quotations are hereby invited for the supply of 2 test target generator (TTG) systems to the CSIR. One unit will initially be ordered with the optional ordering of the second unit at a later date within one year.

### 2 QUOTATION REQUIREMENTS

#### Test Target Requirements

For use in the field deployable sensor system an integrated Radar and Optronic test target system is required. The test target will consist of the following main elements:

1. Radar Test target generator.
2. Optronic Test Targets (Day and Night).
3. Remote control for a few main functions.
4. Power Supply unit.

**The test target shall be configurable to be used for the following functions:**

1. Verify radar functionality.
2. Verify optronic sensor functionality.
3. Perform and verify radar, optronic sensor alignment.
4. Perform absolute system north alignment.

#### General System requirements

These are system level requirements that are mostly overarching of several sub-systems.

1. Standby mode with only controller and wireless link on with minimal power usage.
2. Programmable Real time clock/timer to switch on different (programmable) units on periodically
  - a. Period and duty cycle programmable.
  - b. Functions to be switched on programmable.
3. The electronics shall include a GPS receiver for position reporting via remote link.
4. The total system shall be corrosion resistant for at least 5 years.
5. At least IP66 rating implies dust tight and can stand outside in the rain.
  - a. Not required to operate in rain.

### **Radar Test Target Requirements:**

6. Frequency band (Agile bandwidth) (as a minimum):
  - a. 2 to 12 GHz.
  - b. Small portions of the total band (< 500 MHz)
7. Instantaneous Bandwidth: 500 MHz
8. Addition of a Doppler shift (1 Hz – 200000 Hz) programmable.
9. A delay of up to 20 km to be added if required.
  - a. If not required for a specific build, the cost associated with the delay must be minimal (<5% of cost of unit).
  - b. Delay is fixed at 10 km (TBC) for this specific unit, but must be easily changeable by replacing the delay element.
  - c. An analogue RF over fibre solution is acceptable.
10. Frequency change in agile band on demand.
11. Measure power received by system (possible use of power detector). This must be available via remote link.
12. The system must have a variable known gain.
  - a. The gain circuit must be designed so that it can be calibrated so as to represent a fixed RCS (taking into account cable losses and antenna gains).
  - b. The gain must be variable with fixed that have attenuation values of at least 25 dB.
13. Care must be taken to have reasonable power usage (battery powered (10.5 – 14.2 V or if non-lead acid batteries are used an appropriate range)).
  - a. Goal < 2 W in standby and < 10 W in operation excluding optronic sources.
14. Remote control via wireless link.
15. Care taken in design on weight and size – possible use on quad copter. Goal (excluding power source, antennas, communications link and rugged packaging) 100 g, and less than 150 by 100 by 20 mm.

16. When packaged must withstand field use by military personnel or field rangers.
17. Provision must be made to connect and mount antennas to the systems. The antennas will be of medium gain (8-20 dB) and typically antennas for the band of operation will be used (antenna might be wideband covering multiple bands). Antennas are CFE.
18. An optional beacon facility (transmitting a fixed CW signal) must be supplied (using one of the LO's and transmitting this directly (via switch) to the antenna.
19. All LO's used in the system must be locked to a crystal with reasonable frequency and phase performance.
20. Switching between two polarisations at full bandwidth with full protection.
21. A minimum gain of 34 dB is required over the operating bandwidth.

### **Optronic Test Target Requirements**

1. The TTG shall have two day time optronic test sources.
2. The TTG shall have two night time optronic test sources.
3. Optronic test sources shall be separated by at least 1m.
4. The sources are CFE, but provision for power and control to be included.

### **Remote control for a few main functions**

1. The Test Target subsystem shall have a remote control interface.
  - a. Require a low bandwidth link.
  - b. Required range up to 5 km (LOS conditions).
2. Standby mode with only controller and wireless link on with minimal power usage.
3. Require independent power on/off control of:
  - a. Optronic Day time target.
  - b. Optronic Night time target.
  - c. Radar test target.
4. Require remote feedback
  - a. Test target power unit monitoring (Battery charge level etc.).
  - b. Received Radar Power level.
  - c. GPS position.

### **Power Supply Unit**

1. The Test Target shall have standalone self-contained power source.
2. Power supply shall be able to supply the radar test target and one optronic source for at least 6 min per hour over 24 hours. (10% duty cycle need storage for day and night)

3. This will most likely consist of:
  - a. Solar panel.
  - b. Charge controller.
  - c. Battery.

### **Delivery**

1. The Test Target shall be delivered to the CSIR building 44
2. Delivery to be within 8 weeks after placement of order.

### **3 EVALUATION CRITERIA**

- 3.1 Selection of suppliers will be based on the 80/20 preference point system.
- 3.2 Indicate valid B-BBEE status on quotation. No B-BBEE status will equal zero points.
- 3.3 Indicate CSD number (National Treasury Central Supplier Database) on quotation. If not registered yet on CSD, use [www.csd.gov.za](http://www.csd.gov.za) to register.
- 3.4 No order will be issued or no contract will be signed without a valid CSD number.

### **4 PRICING QUOTATION**

- 4.1 Price needs to be provided in South African Rand (excl. VAT), with details on price elements that are subject to escalation and exchange rate fluctuations clearly indicated.
- 4.2 Price should include additional cost elements such as freight, insurance until acceptance, duty where applicable, etc.
- 4.3 Payment will be according to the CSIR Payment Terms and Conditions.

### **5 OTHER TERMS AND CONDITIONS**

- 5.1 The supplier shall under no circumstances offer, promise or make any gift, payment, loan, reward, inducement, benefit or other advantage, which may be construed as being made to solicit any favour, to any CSIR employee or its representatives. Such an act shall constitute a material breach of the Agreement and the CSIR shall be entitled to terminate the Agreement forthwith, without prejudice to any of its rights.
- 5.2 A validity period of 90 days will apply to all quotations except where indicated differently on the quote.

**6 No goods and/or services should be delivered to the CSIR without an official CSIR Purchase order. CSIR purchase order number must be quoted on the invoice. Invoices without CSIR purchase order numbers will be returned to supplier.**

**7 Note: This is not a Purchase Order.**