



Technical Specifications

FOR SUPPLY OF INSTRUMENTS/EQUIPMENTS/SYSTEMS FOR NESAC-ISRO & NEC (vis. MARSAC) SPONSORED RESEARCH PROJECT AT NIT MANIPUR

PROJECT DETAILS: Supply of Instruments/Equipments/Systems at Department of Civil Engineering for the NESAC-ISRO & NEC (vis. MARSAC) sponsored research project entitled:

"FLOOD EARLY WARNING SYSTEMS-MANIPUR (FLEWS-MN)" PoA Project



Item (1) SURFACE VELOCITY RADAR 3D (Profiler/Measurement)

Model: DECATUR SVR-3D

Make: Decatur Electronics

Purpose:

Determine the surface velocity of water. Using historically profiled cross-section of rivers and discharge rates, hydrologists can use the portable handheld SVR 3D to easily and efficiently obtain real-time data to estimate the water discharge rates during flooding in order to make scientific based decisions to alert control centers.



Technical Specifications & Features:

- Proprietary intelligent measurement routines with average speed measurements in as quickly as 5 seconds!
- Water resistant enclosure with superior ergonomics and balance
- Large 2.8" color, sunlight readable LCD display with intuitive color coded instantaneous and average speed displays
- Exclusive spectral and spectrogram displays to quickly evaluate water conditions
- Li-ion 4800 mAh battery with USB battery charging
- Long battery run time - over 25 hours of use before needing recharge
- Drop proof - up to 1.5m without internal damage
- Tilt sensor for auto-correcting vertical cosine angle.
- Display compatible with polarized sunglasses
- Store and recall up to 32K velocity, velocity, time and date readings
- USB data transfer for data retrieval and analysis
- Water discharge measurement capability
- Integrated pica tinny rail accepts tripod mounting, mounting, laser pointing and lighting devices

DR. NGANGBAM ROMEJI

PROJECT FOCAL / P.I.

FLOOD EARLY WARNING SYSTEMS-MANIPUR
Dept. of Civil Engg., NIT Manipur

Item (2) AUTOMATED PARTICLE SIZE ANALYZER**Model: PARIO****Make: Meter Group Inc., USA****Purpose:**

It automatically measures at an interval of 10 seconds and continuously records the change of suspension pressure as well as the temperature of soil/silt particles. This results in highly— accurate and continuous particle size distribution curves. The data is automatically evaluated by data processing algorithm called “Integral Suspension Pressure Method” (ISP).

**Technical Specifications & Features:****Features:**

- Calculation of particle size distribution by Stokes' law
- Autonomous operation after measurement start
- Quasi-continuous resolution of particle size distribution
- No physical disturbance of suspension during measurement
- Avoidance of manual reading errors & manual calculation errors
- Temperature dependence automatically integrated calculation of
- particle size distribution

Specifications:

- Range of particle sizes 63 μm to 1 μm^* (eff. hydrodynamic diameter); *bigger range desired*
- Approximate error in mass fraction detection $\pm 3\%$
- Typical particle mass 25 to 40 g/L suspension
- Typical duration of measurement 8 hours
- Measuring interval 10 s
- Operating temperature range 15 $^{\circ}\text{C}$ to 35 $^{\circ}\text{C}$
- Max. tolerable temperature change during measurement 3 $^{\circ}\text{C}$
-


DR. NGANGBAM ROMEJI
 PROJECT FOCAL / P.I.
 FLOOD EARLY WARNING SYSTEMS-MANIPUR
 Dept. of Civil Engg., NIT Manipur

Item (3) AUTOMATIC WATER LEVEL RECORDER (Pressure Sensor based)
Make: HERON Canada



Purpose:

For recording water level in Rivers, Lakes and Reservoirs for various user related to stream gauging, irrigation, water supply and fluctuation of Ground/Surface water studies. It is also suitable for pumping tests for groundwater and aquifer volumetric analysis. The equipment is designed to take and record measurements in (ground/surface) water. It consists of a pressure sensor for measuring the water level, a temperature sensor, a non-volatile memory to store the measurements and a battery. It is an autonomous data-logger that can be programmed by the user, for instance the sample interval.

Technical Specifications & Features:

Specifications	Dipper Log Vented+
Range in meters	0-10/30/60/120 meter (choose any suitable range)
Level Sensor	Vented type 316 Stainless Steel Piezoresistive Silicon
Wetted material	316 Stainless Steel & Delrin, Buna-N
Pressure Resolution	0.001 % FS
Level Sensor Accuracy	± 0.05% FS or better
Over Pressure Rating	2X
Temp. Sensor Range	-20 °C to 80 °C
Temp. Sensor Accuracy	± 0.05 °C
Barometric compensation	Through vent tube
Approximate Memory	1,28,000 readings
Memory Modes	Continuous
Sampling Modes	Linear, Future Start, Real-Time View
Sampling Rate	1 sec – 24 hours
Operating Temp. Range	-20 to 80 °C
Typical Battery Life	Up to 15 years or up to 5,00,000 readings

Dr. Ngangbam Romeji
DR. NGANGBAM ROMEJI
 PROJECT FOCAL / P.I.
 FLOOD EARLY WARNING SYSTEMS-MANIPUR
 Dept. of Civil Engg., NIT Manipur

Item (4) MINI DISK INFILTROMETER**Model:** S, portable**Make:** Meter Group Inc., USA**Purpose:**

To test unsaturated hydraulic conductivity and infiltration rates for field assessment of soil & water. field instrument ideal for irrigation system assessment, river erosion hazard evaluation, burn severity studies, and many other applications.

Technical Specifications & Features:

Total Length - 32.7 cm; **Diameter of tube**- 3.1 cm

Sintered stainless steel disc: 4.5 cm dia., 3 mm thick

Length of suction regulation tube: 10.2 cm

Suction range: 0.5 to 7 cm of suction

Length of water reservoir: 21.2 cm; **Length of Mariotte tube:** 28 cm

Volume of water required to operate: 135 ml


DR. NGANGBAM ROMEJI
 PROJECT FOCAL / P.I.
 FLOOD EARLY WARNING SYSTEMS-MANIPUR
 Dept. of Civil Engg., NIT Manipur

Item (5) MULTIPARAMETER WATERPROOF POCKET WATER TESTER : pH, Conductivity, TDS, Salinity, Temperature, etc
Model: PCSTestr 35
Make: Thermo Eutech



Purpose:

For wide-range measurements of pH, Conductivity, TDS, Salinity and Temperature in water and wastewater applications.

Technical Specifications & Features:

- ☐ One sensor measures 5 parameters – no need to switch sensors for different measurements
- ☐ Full pH range measurement at up to 2 decimal resolution
- ☐ Low, medium and high Conductivity ranges – tester even measures pure water (0.0 to 199.9 $\mu\text{S}/\text{cm}$; 200 to 1999 $\mu\text{S}/\text{cm}$ and 2.00 to 20.0 mS/cm)
- ☐ Low, medium and high TDS ranges (0.0 to 99.9 ppm; 100 to 999 ppm and 1.00 to 10.0 ppt)
- ☐ Multi-range Salinity measurements of up to 10.00 ppt or 1.00 %
- ☐ Up to 5-point pH calibration and 3-point Conductivity/TDS/Salinity calibration
- ☐ Adjustable TDS factor (0.40 to 1.00) and Temperature Coefficient Feature (0.0 to 10.0 $\%/^{\circ}\text{C}$)


DR. NGANGBAM ROMEJI
 PROJECT FOCAL / P.I.
 FLOOD EARLY WARNING SYSTEMS-MANIPUR
 Dept. of Civil Engg., NIT Manipur

Item (6) LAPTOP WORKSTATION/WORKBOOK (core i9/xeon processor)**Make: HP/DeLL/Lenovo (preferred: HP)****Model: Workbook/Z Book (intel core i9 processor)****Purpose:**

For Numerical Weather Prediction (WRF, MM5) model runs which requires high computational resources, hydrological modelling; computation of flood flows, etc in real-time mode with portability and reduction in computational time for increasing forecast lead time in operational component.

Technical Specifications & Features:

- 13th Generation Intel ® Core™ i9 processor
- Windows 11 Home/Professional
- 16 to 17 inch diagonal QHD display (opted: 240 Hz refresh rate, 5-7 ms response time display)
- NVIDIA® GeForce RTX™
- 32 GB RAM DDR5 (expandable)
- 1 TB SSD Hard drive (expandable)
- Backlit RGB 4-zone Keyboard/

(or as applicable)

NB: The Technical Specifications provided in all the above 6 (six) items, must be compliant with established standards (ISI, ISO, etc) and in case compatibility issues arises, the same will be taken into consideration for the revised/modified product configuration/model.

Dr. Ngangbam Romeji
(Project Focal/PI – FLEWS-Manipur project)
Associate Professor
Department of Civil Engineering
National Institute of Technology Manipur

Dr. NGANGBAM ROMEJI
PROJECT FOCAL / P.I.
FLOOD EARLY WARNING SYSTEMS-MANIPUR
Dept. of Civil Engg., NIT Manipur