





### **3.1 DEVELOPMENT AND IMPLEMENTATION OF E-MARE : EQUIPMENT PROCUREMENT STATUS**

PROJECT:	
PROJECT NO:	
GRANT AGREEMENT NO:	
PARTNER:	

MARE: Marine Coastal and Detail Sustainability for Southeast Asia 610327-EPP-1-2019-1-DE-EPPKA2-CBHE-JP 2019-2079/001-00 Universiti Teknologi Malaysia (UTM), Malaysia

No	DESCRIPTION	PRICE	STATUS
1	PRO DSS Handheld Multiparameter	RM32,520.00	Completed
	Water quality measurement system with		
	optical dissolved oxygen smart sensor		Delivered on
			1/10/2021
2	DELL EMC PowerEdge R740		
	R/40-XS4216-8-16-600-/30-3YRSMS-		
	DUAL CPU SOCKET (1 CPU Configuration)		
	R/40-Silver4216-16G-600G-H/30-		
	3YRPRO(STS)/PC2005130012		
	Processor: Intel Xeon Silver 4216 2.1G,		
	10C/321, 9.6GT/S, 22IVI Cache, Turbo, HT		
	(10000) DDR4-2400		
	Pank		
	Management: iDRAC9 Enterprise		
	Hard Disk: 1 & T 10K RPM 12Ghps		
	PC DELL OntiPlex 700" Processor Intel		Completed
	Core i9700 processor(8 core, 12MB		completed
	Cache, up to 4.7 GHz with Intel Turbo	RM68.780.00	Delivered on
	Boost Technology): Operating System:		30/8/2021
	Windows 10 Pro 64-bit, Memory: 16GB		
	DDR4 at 2666Mhz Graphic Card: NVIDIA		
	GeForce GTX 1650 GDDRS		
	Networking Switcher		
	Dell Networking Switcher S3124, L3, 24x		
	1GbE,		
	2xCombo, 2x10GbE SFP+ fixed ports,		
	Stacking, IO to PSU		
	airflow, 1x AC PSU[S3124]		
	Components		
	1 Power Cord, 250V, 1.8M, C13		
	(MY/SG/Sri		
	Langka/Bangladesh/HK)		







### **1. YSI PRO DSS MULTIPARAMETER WATER QUALITY CHECKER**

The YSI Pro DSS Multiparameter Water Quality Checker equipment was purchased under the MARE Erasmus Grant to be used for teaching purposes in postgraduate classes. It is also being used for postgraduate students' research. The subjects are Water Quality Management and Assessment, and Environmental Management and Sustainability. Before going to the rivers around UTM, the students have been given online demonstrations of how to use the equipment. Postgraduate students under the MARE Erasmus program use the equipment monthly for water quality and aquatic life monitoring for accumulation of microplastics. The water quality parameters involved are temperature, dissolved oxygen, salinity, conductivity, atmospheric pressure, and water depth. The figures below show the usage of equipment for postgraduate research activities. This YSI Pro DSS Multiparameter Water Quality Checker is placed in the Civil Department under the supervision of Dr. Shamila. YSI Pro DSS Multiparameter Water Quality Checker was also used in conjunction with aquatic life monitoring to measure dissolved oxygen and water temperature.

The activities also used the equipment as shown in Table 1.



Figure 1: Sampling using the equipment. YSI Pro DSS Multiparameter Water Quality Checker Logger display. Sampling was also conducted for phytoplankton collection.









Figure 2: Research activities conducted at sea.

Table 1: Specific activities using the equipment

### 1. MARE Research

PhD Student sampling: Mazni Mat Zin



Location Kampung Pasir Putih, Pasir Gudang, Johor



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Location Kampung Pasir Putih, Pasir Gudang, Johor

## 2. MARE Stakeholder Involvement-Community with University

Name of Program : Program Denai Sungai Komuniti 2022 Location: Sungai Melayu Estuary Date: 24 Sept 2022 Participants: 240 Sekolah Rendah Kampung Sungai Melayu, Sekolah Kebangsaan Medini, Institut Pendidikan Guru Johor



**Exhibition Booth** 



Explanation on how to conduct insitu water quality monitoring to participants, school children

3. MARE course activity **Class field work for Water Quality Management** Date: 27 Nov 2022 Location: Kokol Hill Waterfall, Sabah



Class field work for MKAK 1063 Water Quality Assessment and Management

Date: 13 Jan 2023

Location: Sungai Ayer Hitam Besar, Kampung Sri Gunung Pulai

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Class field work for MKAK 1063 Water Quality Assessment and Management Date: 16 June 2023

Location: Sungai Ayer Hitam Besar, Kampung Sri Gunung Pulai



Class field work for MKAK 1063 Water Quality Assessment and Management (offshore program) Date: 17 June 2023

Location: Sungai Klang Gate, Kuala Lumpur



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# **Class field work for MKAK 1043 Environmental Quality Analysis** Date: 19 June 2023

Location: Tasik Ilmu, Universiti Teknologi Malaysia, Johor



**Environmental Engineering Laboratory Staff Competency Training** Date: 5 July 2023 Location: Tasik Ilmu, Universiti Teknologi Malaysia, Johor



### 2. DELL EMC POWEREDGE R740 AND NETWORK SWITCH

The purchased DELL HPC and Network Switch are stationed at the Computer Laboratory of the Marine Technology Center, under the supervision of Prof. Dr. Adi Maimun. (Figure 3 to Figure 4). The DELL HPC have been used for postgraduate and undergraduate students' CFD simulation research. This HPC is important for the research activities that require a highperformance computer to simulate, analyse, optimise and verify the hydrodynamic performance. The simulation activity can lead to a reduction in the cost of the experiment. For the time being, OpenFOAM is the software used for CFD simulation.



Figure 3: Server R740 has been installed and stored in a Computational Server Station in Marine Technology Center, UTM. It is currently used for students' simulation work.

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Figure 4: PC Dell has been installed and located in student research room. Students use the PC to prepare modelling and simulation set-up and the simulation work has been completed using R740 Server.

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The network switches provide dedicated and secured network infrastructure for the computing servers. The network allows remote and local user and application access as well as data ingestion for the lab applications, data lake and data warehousing. While at the same time, it also provides security from unauthorized access to the server and storage. Our research center, Marine Technology Center UTM has applied for Static IP with Virtual Private Network (VPN) from the UTM Digital team on 17th October 2022 in order to complete the configuration setup of the networking switcher as shown in Figure 5. The IP address have been provided for the Networking Switcher on 27th October 2022; (ip address : 10.50.124.10, 10.50.124.9). The High Computing Computer (HPC) is ready to be used using the IP address and the database management using this device can be easily managed by our centre. The network switch is currently used to manage server during students' simulation work.



Office:+607 5532069 ext. 32069@6479 | Fax: +607 5566164 Mobile:+60177704407 Primary Email: active Contemport

Figure 5: Confirmation of Static IP for DELL EMC PowerEdge R740 with 2 Networking Switchers S3124 which have been installed in Marine Technology Center, UTM

The MARE related research works which utilized this equipment are 1) Hydrodynamic Analysis of Vertical Axis Turbine for the Development of Renewable Energy Device and 2) Powering Analysis of Multihull Design Ship for Green Shipping.

In the future, the DELL HPC with the network switch will be used in an IOT-Based River Monitoring Database System, which was proposed based on the idea presented in Figure 6. The buoy as shown in Figure 7 is a part of MARE research which have been developed under supervision of Prof. Dr. Adi Maimun.

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Figure 6: Hardware Architecture and System-Storage Server



Figure 7: Trial of Buoy System which was designed and developed in UTM

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