

Memorandum of Understanding (MoU)

is made and entered into this 22nd day of Oct.2021

BETWEEN

**Sreenidhi Institute of Science and Technology (SNIST)
Hyderabad, Telangana**

Sreenidhi Institute of Science and Technology–Hyderabad, sponsored by Sree Educational Group was established in the year 1997. SNIST is an autonomous institute under JNTUH with its campus located at Yamnampet, Ghatkesar, Hyderabad – 501301, TS, India. (hereinafter called “SNIST”) represented by its Principal, Dr. T. Ch. Siva Reddy, which expression shall where the context so admits includes its successors and permitted assigns of the other part.

AND

Murata Electronics Singapore (Pte) Ltd, Singapore

Murata Electronics Singapore (Pte) Ltd is the Singapore subsidiary and ASEAN headquarter of Murata Manufacturing Co., Ltd., a worldwide leader in the design, manufacture and sale of ceramic-based passive electronic components, sensors, communication modules, power supply modules and batteries. Since its establishment in Kyoto, Japan in 1944, Murata Manufacturing Co., Ltd. has contributed to the evolution of the electronics industry and the advancement of society, within application areas in automotive, consumer devices, wireless connectivity, healthcare equipment and solutions, industrial, energy and more.

**For collaboration on research and innovation to solve
Sustainable Development Goals under the Open Innovation Framework established
by Murata Manufacturing Co., Ltd.**

This MOU sets down the mutually agreed broad framework for collaborating on research and innovation in various fields of common interest related to bringing the results of Science and Technology to society. It incorporates the modalities for partnership on these and other areas of mutual interest between SNIST and Murata Electronics Singapore (Pte) Ltd (“**Murata**”).

1.0 PREAMBLE

1.1 Murata, under its Open Innovation Framework welcomes collaborative relationships with start-up towards developing solutions in the mobility, energy, healthcare, and wireless markets. With its specific focus on start-up companies and universities, the initiative provides them the opportunity to explore go-to-market plans drawing on Murata’s extensive R&D capabilities, manufacturing support capabilities, and financial resources. It also works on improving technologies to improve farm production and income to farmers.

1.2 SNIST is recognized by the Department of Scientific and Industrial Research (DSIR) as a Scientific and Industrial Research Organization (SIRO). SNIST established Sreenidhi ASCEND, a Section-8 Company, as the Incubation and Entrepreneurship Development



Center. Apart from that SNIST is recognized as the Host Institute facility under the Development Commissioner – New Delhi Scheme to Support Entrepreneurship and Managerial Development of SMEs through Incubators.

1.3 The activities identified under this MoU are in several ways complementary with each other. While Murata is the manufacturer and technology provider for Electronics hardware and sensors in the smart society solutions especially in the application domain of agriculture under this MoU. SNIST has expertise in emerging technologies innovation and deployment. Its faculty have carried out numerous consultancy work for reputed organizations through product development, technology training & services, research and innovation.

1.4 It is therefore felt that a collaborative program would be of considerable mutual benefit for both the parties. The collaboration would cover the preliminary stage of data collection and evaluation, with a view of eventual modernization of existing agricultural practices through application of emerging technology. Such a synergy will also bring the wisdom and talent / expertise of the SNIST into the Agri-Biotechnology and Agriculture/Horticulture oriented product testing for Murata. This collaboration will also help in generating value for the society that is based on Science & Technology driven entrepreneurship, through a systematic study of related systems and practices.

1.5 This MOU is the result of a fruitful discussion within and between Murata and SNIST to develop stimulating and dynamic collaboration, to attain the beneficial goals between the parties.

2. Scope of Work – Preliminary Evaluation of Micro Irrigation System (MIS) for a duration of 3 months - Project Commencement (T1) would come in effect after receipt of the sensors related equipment and necessary orientation

- 1) Identify value proposition for farmers
 - Benefits of sensor systems for irrigation and fertilization
 - Deployment of irrigation and sensor system, data collection, and validation – water consumption, Fertilizer usage, Yield, Overheads (water, electricity and labour), and Income
- 2) Technology readiness evaluation
- 3) Record technology effectiveness and suggest improvement
- 4) Collaborate on implementation of product fusion from SNIST and other partners
 - The detailed statement of work and deliverables is attached here to and marked as “**Annexure A**”.
 - The budget distribution and justification is specified in “**Annexure B**”



3. The Roles and Responsibilities of SNIST under to the Scope of Work:

- 1) SNIST will provide key R&D and Consultancy services to Murata towards testing of their product and technology under the scope of work.
- 2) SNIST will provide required space and infrastructure to perform activities proposed in the scope of work.
- 3) SNIST will assess the project progress time-to-time and provide feedback for continual improvement.
- 4) SNIST will conduct field trips for data collection and generate reports.
- 5) SNIST will assign the appropriate faculty and student team to perform its part of the scope of work under this program and Murata will reimburse the time and expenses incurred by the faculty and student team in carrying out the Scope of Work.
- 6) SNIST will identify the necessary land resources (of approximately three (3) Hectares) and procure the necessary installation permissions through the appropriate government channels in India. SNIST may perform this together with the assistance of its other partners (such as PJTS Agriculture University and the Research and Innovation Circle of Hyderabad (RICH)).

4. The Roles and Responsibilities of Murata under the Scope of Work:

- 1) Murata would provide necessary sensors and equipment for deployment, orientation and training, product specifications and implementation expertise to commence the work.
- 2) Assist to establish necessary infrastructure specific to the scope of work, with support of required hardware and software tools.
- 3) Murata will provide reimbursements to student interns, field trips and faculty timeoff to work on the MIS project which will be disbursed by SNIST.

5. NON- EXCLUSIVITY OF THE MOU

MURATA and SNIST shall each have its unrestricted rights to seek additional funding from and /or to cooperate with any other agencies / institutions for the same scope of activities and shall each have unrestricted rights to enter into MOUs with any other parties.

6. Intellectual Property

- a) Intellectual property will refer to all patents, copyrights, trademarks, protections, geographic indicators and other intellectual property protections, including plants, genes and chemical structures. Intellectual property also includes oral or written know-how of relevance to the research activities of the two parties. Intellectual property ownership, authorship and commercialization are three aspects that will be considered. Ownership and commercialization are discussed below. However to merit authorship, it is required that the inventor has participated in the research activity relevant to the invention and contributed to the claims of the invention when a patent is involved. An author of a patent can be a faculty, student an alumnus, or a scientist.



- b) Intellectual property types relevant to this MOU are
 - i. Patented and unpatented know-how developed at prior to interaction with SNIST/MURATA on a specific problem, (background intellectual property).
 - ii. Patented and unpatented know-how developed and data collected during of the course of this MOU by MURATA and SNIST (new developmental intellectual property)
- c) Intellectual property of Murata obtained prior to collaboration between Murata and SNIST on a specific problem will belong to MURATA. Intellectual property of SNIST prior to such collaboration will belong to SNIST and any back ground Intellectual property that involves parties in addition to MURATA and SNIST must be made known to all concerned before this collaboration is inked.
- d) Intellectual property generated jointly during the operation of this MOU shall vest in and be solely owned by MURATA.
- e) MURATA and SNIST may each use the information and data generated under this MOU for non-commercial education and research purposes. Any other information or restrictions regarding the disclosure of intellectual property from one party to the other party shall be governed by a Non-Disclosure Agreement (NDA) between both parties.

7. Confidentiality: Both the parties of the MOU, agreed to hold in confidentiality of any information/data that may be received or noticed, shall not disclose the same to any third party without mutual written consent.

The Murata further undertake to maintain strict confidence of the SNIST' administrative procedures / academic secrets that he may get by virtue of their association with this MOU ,since the Murata may get access to record, teaching methods, proprietary information, intellectual property etc., which the SNIST holds the rights and also any data of the Students /Faculty received by him. The Murata, further agrees to keep all such information strictly confidential and refrain from discussing / distributing this information with anyone else or outsiders.

8. Applicable Laws: This Agreement shall be interpreted in accordance with the laws of India. Notwithstanding anything contained anywhere in this MOU, SNIST has the right to approach the Courts of competent Jurisdiction seeking injunctive relief against any infringement or violation of any their rights and their students

9. Dispute Resolution: Any dispute or difference arising out of or in connection with or relating to the present Agreement shall be referred to and settled by an independent Sole Arbitrator to be appointed with mutual consent. The arbitration shall be held under the Arbitration and Conciliation Act, 1996 and any statutory modifications thereto. The Seat of the Arbitration shall be at Hyderabad.

10. Amendments :No amendments or modifications of this Agreement shall be valid unless evidenced in writing and signed by a duly authorized representative of both Parties of this Agreement.

11. Validity

This MOU is valid for one year from the date of signing of this MOU. Thereafter the MOU may be renewed for such term and on conditions as may be agreed between the Parties.



12. No Assignment

Neither party without the written consent of the other may assign either the benefit or the burden of this MOU to anybody.

13. Termination

Either party may terminate the MOU for cogent and logical reasons, by giving to the other party 30 days' notice in writing.

14. Entire Agreement

This document represents the entire agreement between the Parties regarding the subject matter of this MOU and can only be amended or modified by an agreement in writing signed by the Parties hereto.

15. Legal Effect

This document is not intended to impose any legal obligation whatsoever on either party (whether based in contract, tort or under statutory law). The parties do not intend to be bound by any agreement until both agree to and sign a definitive written contract. Neither party can rely on any promises inconsistent with this paragraph. This paragraph supersedes all other conflicting language.

16. Reimbursement of Expenses

Expenses.

Murata agrees to reimburse SNIST for all documented, out-of-pocket expenses incurred by SNIST's faculty and student team under clause 3.5. The reimbursement shall be made within thirty (30) days after the date of each invoice **raised by the SNIST**. The total amount of expenses incurred by SNIST for the duration of the scope of work under clause 2 shall not exceed **Rs. 3,45,000** Indian Rupees (INR **Three Lakhs and Forty Five Thousand**) plus taxes as applicable (if any) according to the breakdown in Annex B of this MOU.




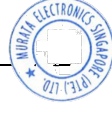
17. Force Majeure

Either Party shall be excused from any delay or failure in performance required hereunder if caused by reason of any occurrence or contingency beyond its reasonable control, including, but not limited to, acts of God, acts of war, fire, insurrection, strikes, lock-outs or other serious labor disputes, riots, earthquakes, floods, explosions or other acts of nature. The obligations and rights of the Party so excused shall be extended on a day-to-day basis for the time period equal to the period of such excusable interruption. When such events have abated, the Parties' respective obligations hereunder shall resume. If the event of the interruption of the excused Party's obligations continues for a period in excess of 30 calendar days, either Party shall have the right to terminate this Agreement upon 10 calendar days' prior written notice to the other Party.



Signatures:

This MOU, is executed in duplicate with each copy being an official version and having equal legal validity .By signing below, the SNIST and Murata, acting by their duly authorized Officers/Representatives, have set their hands are caused this MOU to be executed as of the day and year above written/mentioned.

For Sreenidhi Institute of Science and Technology, Hyderabad – 501301. INDIA		For Murata Electronics Singapore (Pte) Ltd, Singapore	
Signature		Signature	 DocuSigned by: 83AE329F39E14DB
Name	Dr. T. Ch. Siva Reddy	Name	Haruo Mitsuhashi
Désignation	Principal	Désignation	General Manager
Place	Hyderabad, TS, INDIA	Place	Singapore
Date	22/10/2021	Date	22/10/2021
Stamp/Seal	 PRINCIPAL Sreenidhi Institute of Science and Technology Yamnampet (V), Ghattiesar (M), Medchal (Dist.), Telangana-501 301.	Stamp/Seal	 DocuSigned by:

Annexure A

Statement of Work and Deliverables

To proceed into 2 phases and roles of related stakeholders are as below:

[Phase-1]

- Deployment & Preliminary Data collection (SNIST)
- Data collection for Farmer's Value Proposition (SNIST)

[Phase-2]

- Data validation & Brush-up Business Model (RICH & Deloitte)
- Connect with local stakeholders for business validation (RICH)
- Finalize business model (RICH & Deloitte)

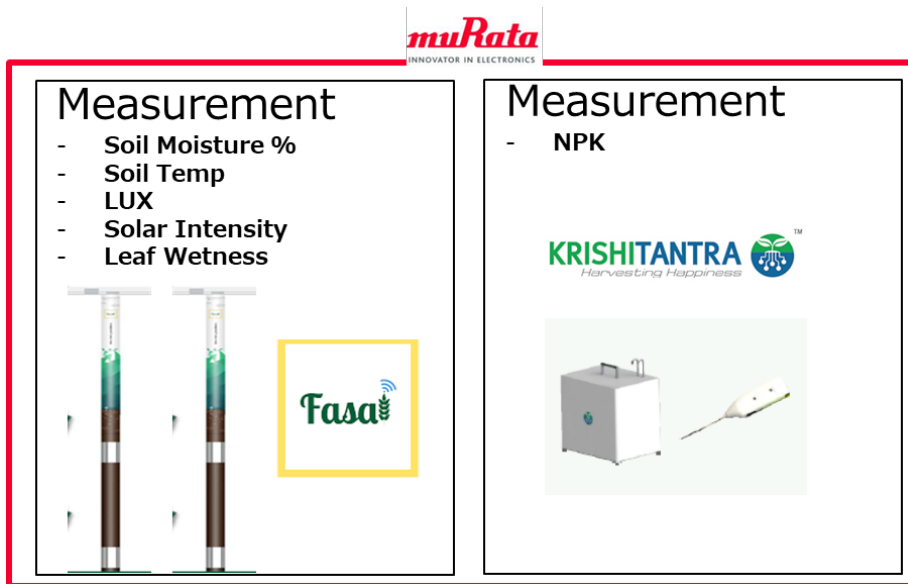
This Statement of work & Deliverables covers for only Phase-1 with SNIST.

Phase-2 plans will be decided only after data validation & brush up of business model by RICH, Deloitte and Murata.

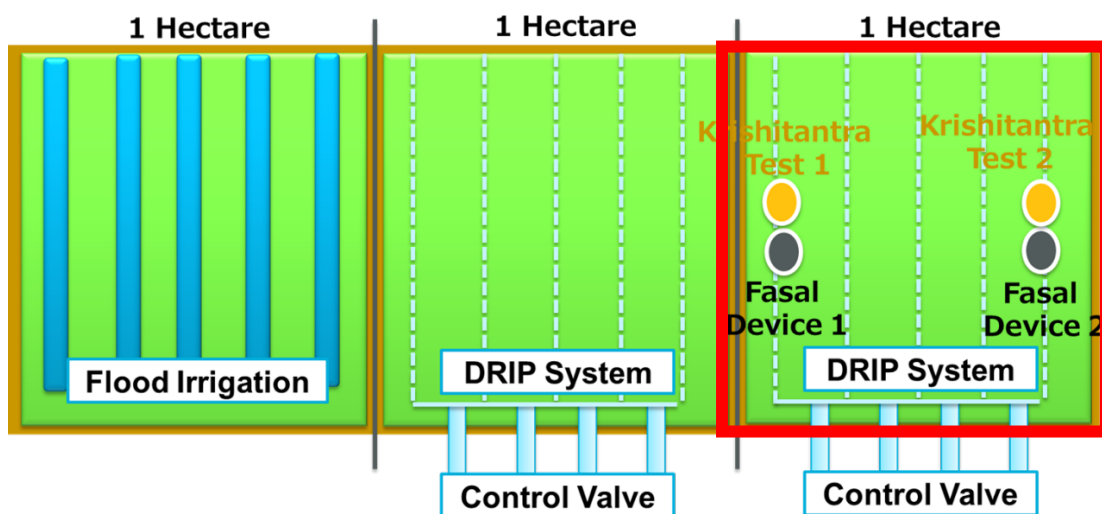
● **Details of PoC for Phase-1**

- Period : 3 months (T1 + 90 days)
- Crop : Chilly / Grapes / Pomegranate / Tomato (select one)
- Irrigation : 3 Ha with different irrigation system as below:
- 1 Ha (Surface irrigation)
 - 1 Ha (Drip irrigation)
 - 1 Ha (Drip irrigation + IoT system)

IoT System : To be prepared by Murata (as below)



Deployment : To set up as below for data collection



● Statement of Work for Phase-1 (SNIST)

Deployment & Preliminary Data collection

- Deployment in field with Murata's partner Products & Protocols
- Data Collection for benefits of Sensor system for Irrigation & Fertilization
- Confirm the acceptance of Farmers to use for new technology and lacking points of provided product

● Deliverable for Phase-1 (SNIST)

With IoT Technology:

How much water was reduced for Irrigation? How much Fertilizer and Pesticide was reduced? What is the interest level of farmers to use this tech in their farm? What was lacking in the provided technology?

Consolidated report for the above.

- SNIST can use its related in-house technologies (which is optional) for data collection purpose without any obligations to Murata. If any interest arises, it will be discussed separately and not covered in the proposed MoU or Statement of Work.

Summary of Data to be collected:

Data Collection	Tech	Data Collection Method	Season-1						
			SNIST Campus			Field Level			
			①	②	③	①	②	③	
Water Consumption	Fasal	SNIST Tech?							
Fertilizer & Pesticide Usage	Krishitantra	Manual							
Product Lacking Points	Fasal & Krishitantra	Interview with Farmers	① Flood Irrigation ② Drip Irrigation ③ Smart Irrigation						
Acceptance of farmers to use									
Consolidated report		Validation of concept							

● Timeline & Deliverables for Phase-1

Purpose	Location	Data
<ul style="list-style-type: none"> ● Deployment ● Data collection for Irrigation & Fertilisation ● Confirm acceptance of Farmers to use 	SNIST Campus	◆ Water Consumption
	Trail in Field	<ul style="list-style-type: none"> ◆ Water Consumption ◆ Fertilizer & Pesticide Usage

Annexure B**Budget Distribution and Justification for Phase -1**

Sr. No.	Items	At T1	T1 + 30Days	T1 + 60Days
1.	Total Six Student Interns (B.Tech + M.Tech) involved in training, deployment, data collection from fields located at different location identified by RICH	Rs. 75,000	Rs. 75,000	Rs. 75,000
2.	Junior Faculty / Research Scholar	Rs. 10,000	Rs. 10,000	Rs. 10,000
3.	Travel	Rs. 15,000	Rs. 15,000	Rs. 15,000
4.	Contingencies and Other Overheads	Rs. 15,000	Rs. 15,000	Rs. 15,000
Total		Rs 1,15,000	Rs 1,15,000	Rs 1,15,000
Grand Total – Rs. 3,45,000/- (Plus Taxes as applicable, if any)				

- ◆ Dr. Ameet Chavan, Professor and Dean (Innovation and Research), will be assigned as the faculty mentor and point of contact from SNIST for the MIS collaborative / consultancy project with muRata.
- ◆ The invoice for each month will be prepared by Dr. Ameet Chavan and forwarded by the Principal's Office.

Thanking you and looking forward for an enriching experience with muRata Electronics Singapore.



Dr. T. Ch. Siva Reddy
Principal, SNIST

