

R & D and IPR Cell
 AY 2019-20

Govt/ NGO – Funded Projects

Sl. No	Name of the Investigator	Dept	Title of the Project	Amount Sanctioned	Name of the Agency	Gov/Non-Gov	Status of the project
1	Mrs G.Sowmya & Dr.M.V.Subraman yam	ECE	Lab VIEW Based Text Detection and Object Recognition Prototype for the Blind and the Dumb People	0.098L	The Institution of Engineers, India	Government	Completed
2	Dr.M.V.Subraman yam	ECE	Recent advances in carbon nano tubes and Graphine based 3D interconnections through silicon vias	3.30L	AICTE, New Delhi	Government	Sanctioned and Rs.3.30Lac is released on 16-1-2020 and Completed.
3	Mrs G.Sowmya	ECE	Entrepreneurship Awareness camp	0.20L	DST-NIMAT New Delhi	Government	Sanctioned and Rs.0.016Lac is released on 23-10-2019 & Rs.0.004Lac is released on 13-11-2019 and Completed.
4	Dr.S.M.D.Farooq	CSE	Entrepreneurship Awareness camp	0.20L	DST-NIMAT New Delhi	Government	Sanctioned and Rs.0.016Lac is released on 23-10-2019 & Rs.0.004Lac is released on 13-11-2019 and Completed.

(Signature)

PRINCIPAL
 Santhiram Engineering College
 Nandyal, Kurnool(Dt.), A.P.

(Signature)
 CO-ORDINATOR



The Institution of Engineers (India)
Technical Department
R&D Grant-in-aid Scheme

PROJECT COMPLETION REPORT

1. Project I.D: RDUG2018027
2. Project Title: LabView Based Text Detection And Object Recognition Prototype For The Blind And The Dumb People
3. Name of the Investigator: Sanitha Bellam
 - a. E-mail: sunil1998reddy@gmail.com
 - b. Contact Address: H.NO:2-27, Hussainapuram, Betamcherla mandal, Kurnool dist, A.P-518598
 - c. Mobile No.: 9701730798
4. Name of the Institution of which Investigator is attached: Santhiram Engineering College
5. Name and Designation of the Guide / supervisor: Dr.M.V.Subramanyam
 - a. E-mail: principal@sreenandyal.edu.in
 - b. Mobile No.: 9866308475
6. Name of the Director / Principal of the Institution: Dr.M.V.Subramanyam
7. Date of Release of R & D Grant: 4/12/2018
8. Date of Commencement of the Project: 21/12/2018
9. Amount of R & D Grant: 9,800/-
10. Date of Receipt of R & D Grant: 21/12/2018
11. How much work is yet to be completed with the reason of delay:
 - a. Percentage of work completed: 100%
 - b. Amount utilized till date: 43,800/-

Continued.....

Principal

Santhiram Engineering College
NANDYAL



The Institution of Engineers (India)
Technical Department
R&D Grant-in-aid Scheme

12. How much work is yet to be completed with the reason of delay: Nil

- a. Work yet to be completed with details: Nil
- b. Reason for delay: Nil

13. Probable date of completion of the project: 14/09/2019

14. Amount of matching grant :

- a) Name and address of the organization: SREC, NI-18, Nerawada 'X' roads, Nandyal, Kurnool dist, A.P. 518501
- b) Date of receipt: 21/12/2018
- c) Amount received: 9,300/-
- d) Amount utilised till date: 9,300/-

15. Name of the organizations providing support to the project:

- a. Name of the organization: Santhiram Engineering College
- b. Nature of support e.g. financial, technical and infrastructural : financial, technical and infrastructural
- c. Support yet to be received: 34,000/-

16. Project Achievements in brief:

We developed a prototype which is useful for blind and dumb people

17. Expected beneficiaries of the project: 1. Object recognition and detection for blind people

- 2. Temperature and humidity conditions of the surroundings are obtained from the prototype
- 3. The text data entered in the software by the dumb people is visible to others.

18. Any other information to be furnished regarding progress of project: 1. Next we will go for paper publication in reputed journal.
rights
2. once the prototype is published we will apply for patent

Continued.....


Principal
Santhiram Engineering College
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The Institution of Engineers (India)

Technical Department

R&D Grant-in-aid Scheme

PROJECT I.D. RDUG2018027

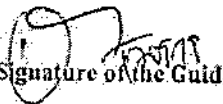
CERTIFICATE

Certified that:

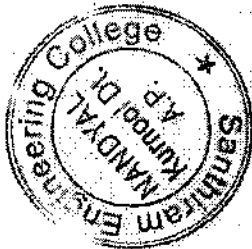
1. The above progress report is correctly and duly audited: YES
2. The necessary infrastructure is available for completion of the project by the due date: YES
3. The balance amount is readily available for completion of the project by the due date: YES
4. Interim technical report on the project has been enclosed: NA
5. The project will be completed by the due date: YES

B. Sunitha

Signature of the Investigator


Signature of the Guide


Signature & Seal of the Director/Principal



Dr. M.V. Subramanyam
B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE, MCSE
PRINCIPAL
Santhiram Engineering College
NANDYAL-518501, Kurnool (Dt.) A.P.


Principal

Santhiram Engineering College
NANDYAL



The Institution of Engineers (India)
 Technical Department
 R&D Grant-in-aid Scheme

UTILISATION CERTIFICATE

(To be submitted in duplicate)

[FOR THE FINANCIAL YEAR - (ENDING 31ST MARCH)]

1. Project ID : RDUG2018027
2. Title of the Project : LabView Based Text Detection And Object Recognition Prototype For The Blind And The Dumb People
3. Name of the Institution : Santhiram Engineering College
4. Name of the Project Guide (PG) : Dr. M.V. Subramanyam

UTILISATION CERTIFICATE

Certified that out of Rs. 9,800/- of grants-in-aid sanctioned during the year 2018-19 in favour of SRECR&D under IET's letter No. dated 20/12/2018 and Rs. 9,800 A sum of Rs. Nine thousand eight hundred rupees only has been utilised for the purpose of R&D Grant-in-Aid-scheme for which it was sanctioned and that the balance of Rs. ----- remaining unutilised at the end of completion has been returned to IET (vide Cheque/DD No. NA dated NA).

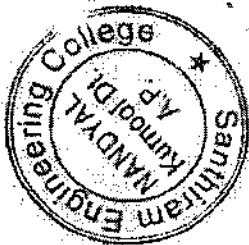
Signature of Principal Guide with date & seal

Signature of Registrar / Director / Principal with date & seal

Accounts Officer of the Institute with date & seal



Dr. M.V. Subramanyam
 B.E., M.Tech, Ph.D, MIEEE, FIETE, MISTE, MIE, MCSI
 PRINCIPAL
 Santhiram Engineering College
 NANDYAL-518501, Kurnool (Dt.) A.P.





The Institution of Engineers (India)

Technical Department

R&D Grant-in-aid Scheme

Objectives (not more than 300 words – in Aerial 9 pt.)

- Most of the people suffer with visual or auditory disabilities either because of weakness or lack of capacity to utilize the sensory organs such as eye and/or ear. These sensory organs basically have control over the remaining parts of the body.
- Object recognition and detection are considered most important help that we can provide through electronic travel aids for the blind since they need a totally independent travel kit that works on the artificial intelligence
- Here the project is focused on the implementation of a hardware and software to recognize an object by using ultrasound technology.
- Another objective of this project is to upgrade the object identification module to notify the temperature and humidity conditions of the location through buzzer.

Achievements (not more than 750 words – in Aerial 9 pt.)

- Here we developed a module which is helpful for the blind and the dumb people.
- With the help of this kit the disability persons can survive by their own and can carry the kit along with them when in need.
- The project kit also gives the information about temperature and humidity report of their surroundings.

Papers published in journals / Papers presented in Seminars / M.Tech Thesis / Ph.D Thesis / Patent generated from this Project NA

Grant received from IET & Year: Rs. 9,800.

Year: 2018-19

Principal
Santhiram Engineering College
NANDYAL



IEI R&D COMPENDIUM PROFORMA

Project title

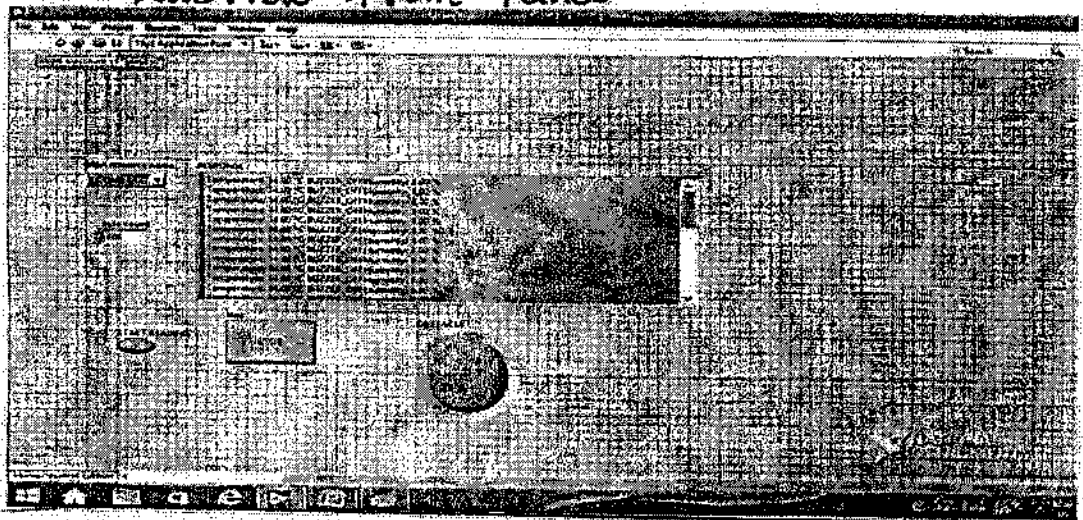
LabView Based Text Detection and Object Recognition Prototype For The Blind And The Dumb People

<u>Student</u>	<u>Guide</u>
Name : B. Sunitha Email: sunil1998reddy@gmail.com Mobile: 9701730798 IEI Membership No.: NA	Name: Dr.M.V.Subramanyam Dept.: ECE Email: principal@sreenandyal.edu.in Mobile: 9866308475 IEI Membership No.:M131932-3
<u>Institute</u>	
Name: Santhiram Engineering college Address: NH-18, Nerawada 'X' roads, Nandyal, Kurnool dist, A.P, 518501 Institutional Membership No.: ---	

Title of the photo: Text Detection And Object Recognition Module



Title of the photo: Object Recognition & Temp Humidity Condition on LabView front Panel





Lab View based Text Detection and Object Recognition Prototype for the Blind and the Dumb People

Student

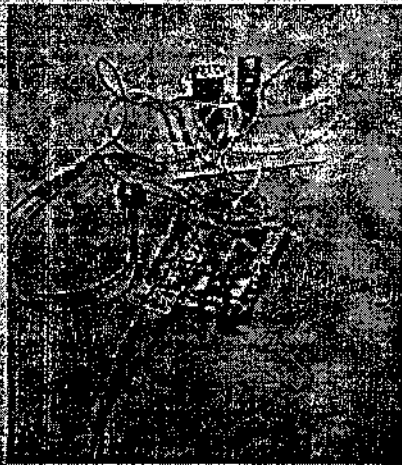
B.Sunitha, Naga Anitha Regati,
Leelavathi, Gopavaram
sumi1998reddy@gmail.com

Guide

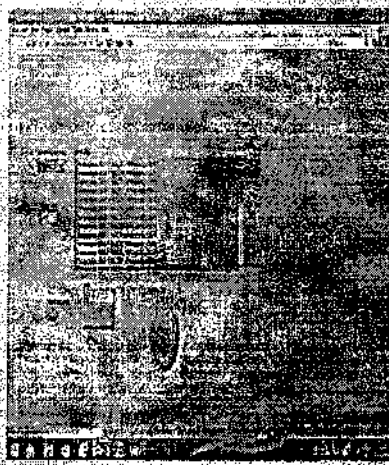
Dr.M.V. Subramanyam, MIE
G Sowmya, MIE
principal@sreanandyal.edu.in

Institute

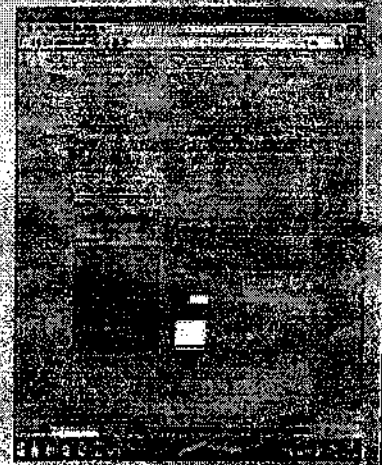
Santhiram Engineering College
NH-18, Nerayada X Roads, Nandyal
Kurnool, Andhra Pradesh
NON-IM



Sensors kit interfaced with
Arduino board



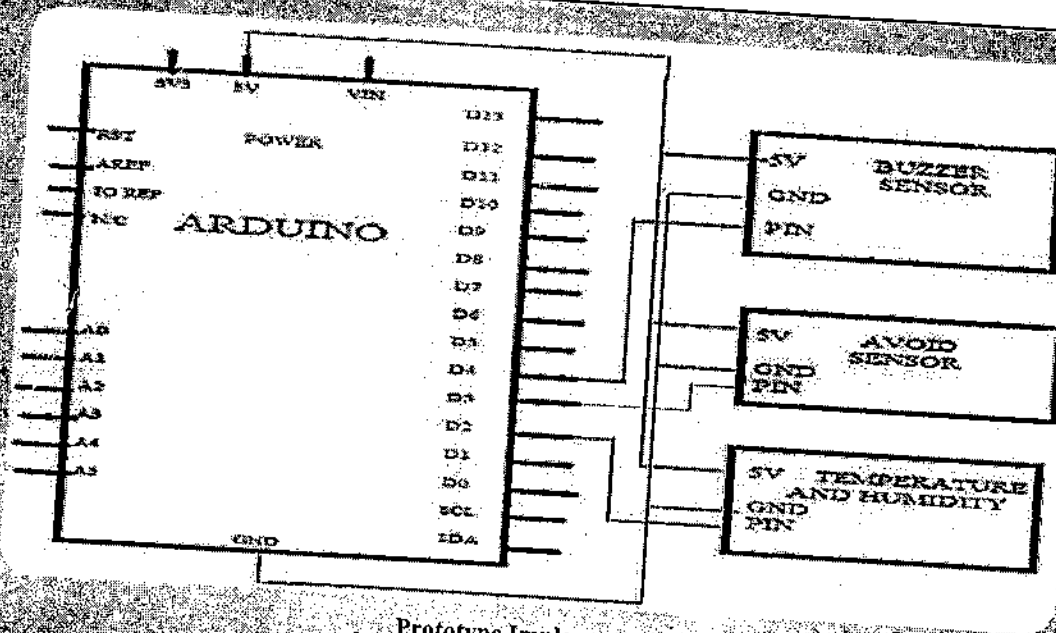
Output in LabVIEW front panel for
DHT and Obstacle detection



Output in front panel for text to
speech

OBJECTIVES

- Most of the people suffer with visual or auditory disabilities either because of weakness or lack of capacity to utilize the sensory organs such as eye and/or ear. These sensory organs basically have control over the remaining parts of the body. This predicament could be in-born or due to the age factor or sometimes meeting with may result from an accident. Disability affects the life of humans irrespective of its origin and reason. The disables require support from other people in their day to day activities.
- Sound source locator is inherently important for safety, survival and navigation of the physically challenged individuals. In addition to sound source locator, the acoustic cues and the visual cues are needed for object detection, tracking and distance measurement etc.
- Object recognition and detection are considered most important help that we can provide through electronic travel aids for the blind since they need a totally independent travel aid that works on artificial intelligence.
- Here the project is focused on the implementation of a hardware and software to recognize an object by using ultrasound technology.
- Another objective of this project is to upgrade the object identification module to notify the temperature and humidity conditions of the location through buzzer.



Prototype Implementation

The project also aims to design a prototype that helps the disables especially the blind and the dumb to walk free as a normal person identifying the objects as well as texts that comes on their way besides notifications of a temperature and humidity conditions of the concerned location.

ACHIEVEMENTS

A module was developed which is helpful for the blind and the dumb people. The design using LabVIEW software and hardware sensors interfaced with Arduino board, achieved designed kit specifications and proved efficient for blind and dumb people with low cost equipment. With the help of this kit the persons with disability can be on their own and can also carry the kit along with them when in need. The project kit also gives the information about temperature and humidity report of their surroundings.

DESCRIPTION

- The developed kit was tested using Arduino Uno board and sensors like obstacle sensor, temperature sensor, buzzer, text converter and Lab VIEW software.
- The blind people could identify an obstacle present in front of them with the help of a buzzer sound.
- The dumb people able to deliver their speech by entering the text in the software which is converted to speech and delivered through the speakers.
- Temperature and humidity could be identified by the device using temperature and humidity sensors.



Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : SANTHIRAM ENGINEERING COLLEGE,NH-18
NANDYAL,KURNOOL DIST,Kurnool
ALUR
ANDHRA PRADESH-518112
IN

Date : 25 Apr 2019

Account Number : 00000033245622746

Account Description : CA-GEN-PUB-OTH-RURAL-INR

Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH

Drawing Power : 0.00

Interest Rate(% p.a.) : 16.7

MOD Balance : 0.00

CIF No. : 86898923696

IFS Code : SBIN0010577

MICR Code : 518002683

Balance as on 1 Jul 2018 : 5,40,387.50

Account Statement from 1 Jul 2018 to 31 Dec 2018

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
24 Aug 2018	24 Aug 2018	CHEQUE WDL-WITHDRAWAL TRANSFER BY CHEQUE-34840	TRANSFER FROM 31859473276 / 34840	10577	50,000.00		4,90,387.50
24 Aug 2018	24 Aug 2018	CHEQUE WDL-WITHDRAWAL TRANSFER BY CHEQUE-34841	TRANSFER FROM 31859473276 / 34841	10577	50,000.00		4,40,387.50
24 Aug 2018	24 Aug 2018	CHEQUE WDL-WITHDRAWAL TRANSFER BY CHEQUE-34842	TRANSFER FROM 31859473276 / 34842	10577	50,000.00		3,90,387.50

Principal
Santhiram Engineering College
NANDYAL

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
10 Dec 2018	10 Dec 2018	CHQ TRANSFER-NEFT UTR NO: SBIN7183448 87733-34856 ELECTRONICS SECTOR SKILLS COUNCIL	/ 34856 ELECTRONICS SECTOR SKILLS COUNCIL	10577	20,005.90		4,65,238.90
18 Dec 2018	18 Dec 2018	BY TRANSFER-PFM C121805741 465 179CSCA 138369--	TRANSFER FROM 31999761052 12 /	10521		28,000.00	4,93,238.90
20 Dec 2018	20 Dec 2018	BY TRANSFER-NEFT*UTIB0 000005*AXT B1835473539 34*IOE*-	TRANSFER FROM 31996790443 02 /	4430		9,800.00	5,03,038.90

**This is a computer generated statement and does not require a signature.



Principal
Santhiram Engineering College
NANDYAL



Ph: 08514 - 276123

SANTHIRAM ENGINEERING COLLEGE

Approved by AICTE, New Delhi - Permanently Affiliated to JNTUA, Ananthapuramu
NH-40, NANDYAL - 518501, Kurnool Dist., A.P.
An ISO 9001:2015 Certified College, 2(A) & 12(B) Recognition by UGC Act, 1956

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal **SREC/PRO/E- 03/20**

Cell : 9866308475

To

The Drawing and Disbursing Officer,
All India Council for Technical Education,
Nelson Mandela Marg,
Vasant Kunj, New Delhi - 110070.

Date: 17.02.2020

Sir,

Sub: SREC, Nandyal-Acceptance Letter- Grant offered in response to the proposal applied under the scheme of Short Term Training Programme (STTP) for the year 2018-19- Req- reg.

Ref: F.No.34-65/180/RIRD/STTP/Policy-1/2018-19, Dt:12-12-2019.

Greetings from SREC, Nandyal

At the outset, we thank AICTE for a sanctioning Short Term Training Programme (STTP) grant to our Institution towards the topic entitled "**Recent advances in Carbon Nanotube and Graphene based 3-D Interconnections Through Silicon Vias**",

With reference to the above, we hereby given our consent for the proposal and as per the terms & conditions mentioned in the sanctioned order. The name of the Coordinator and other details of the above STTP grant are as follows:

Name of Co-ordinator	: Dr.M.V.Subramanyam
Duration of the Programme	: One Week
Venue	: Seminar Hall, ECE SREC
Title of the Programme	: Recent advances in Carbon Nanotube and Graphene based 3-D Interconnections Through Silicon Vias

Further, we also undertake that the funds received shall be utilized for the purpose for which they are sanctioned

Thanking You Sir

Signature of Coordinator



Signature of Head of the Institute

Dr. M.V. Subramanyam

Email: principal@srecnandyal.edu.in

PRINCIPAL

Santhiram Engineering College
NANDYAL-518501, Kurnool (Dt.) A.P.

Visit us : www.srecnandyal.edu.in

Principal
Santhiram Engineering College
NANDYAL



Ph: 08514 - 276123

SANTHIRAM ENGINEERING COLLEGE

Approved by AICTE, New Delhi - Permanently Affiliated to JNTUA, Ananthapuramu
NH-40, NANDYAL - 518501, Kurnool Dist, A.P.
An ISO 9001:2015 Certified College, 2(F) & 12(B) Recognition by UGC Act-1956

SREC/PRO/E- 38/2020

Date: 01.06.2020

To

The Drawing and Disbursing Officer
All India Council for Technical Education
Nelson Mandela Marg
Vasant Kunj,
New Delhi - 110070

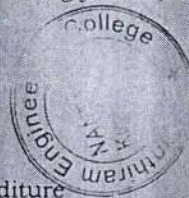
Respected sir,

Sub: SREC- DEPT OF ECE- Submission of final/completion report of AICTE sponsored STTP on Recent advances in Carbon Nanotube and Graphene based 3-D Interconnections Through Silicon Vias along with necessary documents - Request for consideration - Reg.

Ref: Ref.No.34-65/180/RID/STTP/Policy-1/2018-19, Dt:12.12.2019

With reference to your letter cited above, we have received an amount of Rs.3,30,000-00 (Rupees Three Lakhs Thirty Thousands only) towards conducting of AICTE Sponsored "Short Term Training Program (STTP) on Recent advances in Carbon Nanotube and Graphene based 3-D Interconnections Through Silicon Vias". We thank AICTE for providing an opportunity to conduct the program by sanctioning the funds. We are happy to inform you that the STTP program has been successfully conducted during 2nd -7th March 2020. The Program Report along with necessary enclosures are attached for your kind perusal and approval.

Thanking you sir,



Yours faithfully

[Signature]
01/06/20

Subram

Enclosures:

1. Program Report
2. Statement of Actual Expenditure
3. Feedback Form in Prescribed Performa
4. Copy of the Proceedings and Completion report
5. List of Candidates who have Successfully completed the program
6. Report of Program Evaluation Committee

Visit us : www.srecnandyal.edu.in

Email : principal@srecnandyal.edu.in

1

[Signature]

Principal
Santhiram Engineering College
NANDYAL

GRANT FOR ORGANISING SHORT TERM TRAINING PROGRAM (STTP)

FEED BACK FORM

1. AICTE File No.& Date of offer Letter : F.NO:34-65/180/RIFD/STTP/Policy-1/2018-19,
Dt: 12/12/2019.
2. Name of the Coordinator : Dr. M.V. Subramanyam
3. Name and address of the Institution : Santhiram Engineering College
Nandyal, Kurnool (Dist), Andhra Pradesh,
Pin: 518501
4. Title of the Training Program : Short Term Training Program (STTP) on
Recent Advances in Carbon Nanotube and
Graphene Based 3-D Interconnections Through
Silicon Visa.
5. Date (s) : 02-03-2020 to 07-03-2020 (One week)
6. Venue (s) : Seminar Hall, SREC Nandyal.
7. Total No of participants proposed and
Actually attended : Proposed : 40 Attended : 48
8. Total Amount Sanctioned : Rs. 3,30,000/-
9. No and date of sanction letter :

Letter No.	Date	Grant Released
F.NO:34-65/180/RIFD/STTP/Policy-1/2018-19	Dt: 12/12/2019	Rs. 3,30,000/-

10. Total Expenditure incurred in conducting
Short Term Training Program (STTP) : Rs.3,30,000/- (Rupees Three Lakhs
Thirty Thousand Only)
11. Grant received from various agencies other than AICTE for this STTP:

S. No.	Name of Agency	Grant Received
	NIL	

12. Details of internal revenue in any generated by the institution / Department on amount
of this program : NIL


Principal
Santhiram Engineering College
NANDYAL

Briefly mention about technological / academic / or any other benefit generated by conducting this program with respect to a) the institution , b) the faculty , c) students , d) industry / society .

a) The Institution:

The host institution, Santhiram Engineering College, Nandyal-518501, Andhra Pradesh benefitted by way of the following:

The Short Term Training Program (STTP) On “Recent Advances in Carbon Nanotube and Graphene Based 3-D Interconnections Through Silicon Vias” has provided a platform for engineers and researchers to exchange ideas on various areas of carbon nanotubes and graphene based 3-D interconnections. STTP has given an opportunity to our institution to host this type of event. This has improved its reputation on-par with the premier research institutions in the country. Since this institution is located in the rural area, organizing the STTP has given great exposure to our institution at National Level. The terms and subtheme chosen for this training program was very much relevant research trends, and has given prospective authors to emit of discussion and deliberation. This training program has unleashed the novel technologies and addresses various connected with carbon nanotubes and interconnections through silicon vias.

b) The Faculty & c) Scholars:

48 participants from various institutions have participated in this event and participants include Faculty, Research Scholars. All the participants got the exposure about the training program. Research Scholars are very much satisfied and announced that they have got enormous research inputs in their research areas because of the Lectures given by eminent personalities from premier institutions and. Other Engineering Colleges have appreciated the efforts of the host institution.

d) Industry / Society:

With this program teachers, researchers and persons who wish to pursue their research in this area can acquired sufficient exposure on CNT, GNR based interconnections. The teachers in turn will disseminate the knowledge acquired which would benefit the students to excel in the VLSI industry. This concept may help the students to design GNR and CNT based systems which can reduce the power consumption to great extent in a VLSI circuit.

13. The Soft as well as hard copy of the detailed report has been submitted to the council.

Name & Signature of Co-Ordinator

Dr. M.V. Subramanyam

M.Tech, Ph.D

PRINCIPAL

(Dr. M.V. Subramanyam) College

NANDYAL-518 501, Kurnool (D) A.P

Name & Signature of Head of Institute

Principal

Santhiram Engineering College

(Dr. M.V. Subramanyam)

Principal
Santhiram Engineering College
NANDYAL



Account Statement for the period 01/11/2019 to 31/03/2020

Account Number	00000036090312520	Branch	RAJIV GANDHI COLLEGE OF ENGG AND TECH
Address	NH-18, NERAWADA PANYAM KURNOOL Kurnool ALUR ANDHRA PRADESH-518113 India	Account Type	CA-REGULAR- PUB-OTH-ALL- INR
Account Name	SANTHIRAM ENGINEERING COLLEGE	MOD Balance	0.00
Drawing Power	0.00	Interest Rate(% p.a.)	0.0
Balance as on 01/11/2019	6,35,409.50		

Date (Value Date)	Narration	Ref/Cheque No.	Debit	Credit	Balance
16-Jan-20 (16-Jan-2020)	BY TRANSFER C012016871946 full final amount 21BCSSB	TRANSFER FROM 4899755105212		3,30,000.00	9,65,409.50
21-Jan-20 (21-Jan-2020)	CHEQUE WDL CHEQUE TRANSFER TO 950674	TRANSFER FROM 31859473276 Mr. Matam Sivasankar 950674	17,112.00		9,48,297.50
21-Jan-20 (21-Jan-2020)	CHEQUE WDL CHEQUE TRANSFER TO 950670	TRANSFER FROM 31859473276 Mr. Matam Sivasankar 950670	50,000.00		8,98,297.50
21-Jan-20 (21-Jan-2020)	CHEQUE WDL CHEQUE TRANSFER TO 950669	TRANSFER FROM 31859473276 Mr. Matam Sivasankar 950669	75,000.00		8,23,297.50
21-Jan-20 (21-Jan-2020)	CHEQUE WDL CHEQUE TRANSFER TO 950668	TRANSFER FROM 20281599807 Mr. P NAGARAJU 950668	90,000.00		7,33,297.50
21-Jan-20 (21-Jan-2020)	CHEQUE WDL CHEQUE TRANSFER TO 950671	TRANSFER FROM 30353702437 SANTHIRAM ENGINEERING 950671	25,000.00		7,08,297.50
21-Jan-20 (21-Jan-2020)	CASH CHEQUE CASH WITHDRAWAL BY CHQ 950672	950672	30,000.00		6,78,297.50
21-Jan-20 (21-Jan-2020)	CASH CHEQUE CASH WITHDRAWAL BY CHQ 950673	950673	30,000.00		6,48,297.50
22-Jan-20 (22-Jan-2020)	CHEQUE WDL CHEQUE TRANSFER TO 950667	TRANSFER FROM 30839626384 Mr. MANTI	90,000.00		5,58,297.50

Santhiram Engineering College
NANDYAL

Fwd: DST-NIMAT Project 2019-20: Sanction Order

2 messages

Dr.Subramanyam M.V <principal@srecnandyal.edu.in>

Thu, Dec 31, 2020 at 11:45 AM

To: Sowmya G <sowmya.ece@srecnandyal.edu.in>, Dr Farooq Sunar Mahammad <farooq.cse@srecnandyal.edu.in>

----- Forwarded message -----

From: **Sareen** <sareen@ediindia.org>

Date: Wed, Aug 14, 2019 at 12:22 PM

Subject: DST-NIMAT Project 2019-20: Sanction Order

To: <principal@srecnandyal.edu.in>, <principal.srec@srecnandyal.edu.in>, <principal.srec.x5@gmail.com>, <srec.nandyal@gmail.com>

This is a soft copy only for prior Information, no attachments included - (Hard copy with attachments already sent through Speed-post)

Dr. M. V. Subramanyam

Principal & Professor (Department of ECE)

Santhiram Engineering College

NH-18, Nerawada 'X' Roads

Nandyal - 518 501

District: Kurnool

Andhra Pradesh

Dear Sir,

Sub: DST-NIMAT Project 2019-20: Sanction Order

Greetings from Entrepreneurship Development Institute of India, Ahmedabad!

This is with reference to your proposal submitted for conducting activities / programme(s) under the aegis of National Science & Technology Entrepreneurship Development Board (NSTEDB), Department of Science and Technology, Government of India, New Delhi.

We are happy to inform you that the following activities / programmes have been sanctioned:

Sr. No.	Activity / Programme	No.	Amount in Rs.	Locations
1	Entrepreneurship Awareness Camp (EAC)	2	40000	As mentioned in proposal
	Total	2	40000	

You are requested to please go through the enclosed **Guidelines / Terms & Conditions** as it is **mandatory to follow the same.**

Please note that the **first installment is to be released on receipt of the following documents;**

1. Duly Signed Agreement
2. Duly Signed "Terms & Conditions"
3. Action Plan [Annexure-I]
4. Bank Details [Annexure-IA]


Principal
Santhiram Engineering College
NANDYAL

The funds will be transferred through RTGS/NEFT. Please make sure that the above said documents must reach us as early as possible, but not later than ONE MONTH of receiving this sanction letter. Non receipt of the same may be considered as your unwillingness to take up the programme(s).

For any additional information, please contact either me (Email ID: sareen@ediindia.org, Mobile: 09925110040) or my colleague Mr. Prakash Solanki (Email ID: psolanki@ediindia.org, Mobile: 09723816384).

We look forward to have a long term professional relationship.

Thanking you, with regards,

--
S. B. Sareen
Faculty & Head
Centre for SMEs & Business Development Services
Entrepreneurship Development Institute of India
P.O.Bhat - 382 428
Dist. Gandhinagar
Gujarat (India)

Tel.: 0091-79-23 96 91 63
Tele Fax: 0091-79-23 96 91 55 [Direct]
Fax: 0091-79-23 96 91 64
e.mail: sareen@ediindia.org
Mobile: 099 25 11 00 40

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Think before you print, "File this email in an email folder and save a tree." Go Green...

--
Dr.M.V.Subramanyam B.E.,M.Tec.,P.D.D
PRINCIPAL
Santhiram Engineering College [SREC]
Nandyal, Kurnool Dist, A.P., INDIA

Sowmya G <sowmya.ece@sreknandyal.edu.in>
To: "AmareswaraKumar M.V" <amar.cse@sreknandyal.edu.in>

Fri, Mar 26, 2021 at 10:42 AM

[Quoted text hidden]


Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

SREC/PRO/E- 16/19

Date: 26.08.2019

To

Dr.S.B.SAREEN

Sr.Faculty & Project Director

DST-NIMAT

ENTERPRENEURSHIP DEVELOPMENT INSTITUTE OF INDIA

BHAT-382428

GHANDHINAGAR,

GUJARAT

Respected Sir,

Sub: SREC, Nandyal – Acceptance of DST-NIMAT Project 2019-20 for the activity '**ENTERPRENEURSHIP AWARENESS CAMP [EAC]**' of 2 Nos – Request to release the Grant – Req- Reg.

Ref: Letter No. EDII/DST-NIMAT/19-20164, Date:12.08.2019.

As per the reference cited above, we are here with submitting the following formats [2 different sets from two different coordinators] for conducting of EAC in our college.

1. Duly signed agreement
2. Duly signed 'Terms & conditions
3. Action plan- Annexure-I
4. Bank Details – Annexure-IA

Sl no	Name of the coordinator	Name of The activity	From	To	No of days
1	Smt.G.Sowmya	EAC	18.10.19	20.10.19	3 days
2	Mr.S.M.D.Farooq	EAC	01.11.19	03.11.19	3 days

Please sanction the grants at the earliest for conducting 2 activities of EAC in our college as per the action plan.

Thanking you,

Yours faithfully,

Approved by AICTE, New Delhi – Permanently Affiliated to JNTUA, Anantapur
NH - 18, NANDYAL – 518501 :: Kurnool Dist, A.P.
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NANDYAL

Dr. M.V. Subramanyam
B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE, MCSI
PRINCIPAL
Santhiram Engineering College
NANDYAL-518501, Kurnool (Dt.) A.P.

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
23 Oct 2019	23 Oct 2019	BY TRANSFER-NEFT*HDFC 0000240*N29 61909612400 02*Entrepreneurship-	TRANSFER FROM 31996810443 08 /	4430		32,000.00	20,19,353.50
9 Nov 2019	9 Nov 2019	BY TRANSFER-INB IMPS931310 516694/0000 000000/XX34 10/software-	MAA0003850 21912 MAA0003850 21912 TRANSFER FROM 48980261620 96 /	99922		10,000.00	20,29,353.50
9 Nov 2019	9 Nov 2019	BY TRANSFER-UPI/CR/9313 56719927/SR EENIVA/KVB L/996373579 2/Softw-	TRANSFER FROM 50991861620 99 /	10577		10,000.00	20,39,353.50
13 Nov 2019	13 Nov 2019	BY TRANSFER-INB IMPS931716 957851/9999 999999/XX07 95/PRNCPL_AIT-	MAB0003755 76052 MAB0003755 76052 TRANSFER FROM 48979901620 94 /	99922		8,000.00	20,47,353.50
26 Nov 2019	26 Nov 2019	CASH DEPOSIT-CASH DEPOSIT SELF-	/	10577		8,000.00	20,55,353.50
19 Dec 2019	19 Dec 2019	BY TRANSFER-INB B.Tech Comprehensive soft-	CTI0122643 TRANSFER FROM 62243092325 PRINCIPAL GLOBAL COLLE /	99922		8,000.00	20,63,353.50

**This is a computer generated statement and does not require a signature.


Principal
Santhiram Engineering College,
NANDYAL



SANTHIRAM ENGINEERING COLLEGE::NANDYAL

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NH-40, Nandyal – 518501:: Kurnool, Dist. A.P.

DST – NIMAT PROJECT

ENTREPRENEURSHIP AWARENESS CAMP (09/11/2019 to 11/11/2019)

PROFORMA FOR POST PROGRAMME REPORT (PPR) OF EAC

(Effective from 01.04.2017)

1. Name & Address of Programme : **Santhiram Engineering college**
Implementing Agency : NH-18, Nerawada 'X' Roads, Nandyal, Kurnool . A.P
(with Tel/ Fax /E-mail) **Phone: 085142 76201,**
srec.nandyal@gmail.com,
principal@srecnandyal.edu.in
2. Programme Location : Seminar Hall, SREC, Nandyal
3. Programme Date : From 09/11/2019 to 11/11/2019
4. Name of the Coordinator : **S.Md. Farooq, Department of CSE**
5. No. of candidate attended the programme : 47 (Male : 49 Female : 52)
6. List of participants : **ANNEXURE – I**
7. Program schedule : **ANNEXURE – II**
8. List of resource persons : **ANNEXURE – III**
9. List of industries visited : **ANNEXURE – IV**
10. Participant's feedback : **ANNEXURE – V**
11. Photographs of Programme : Enclosed


Principal
Santhiram Engineering College
NANDYAL

Annexure - II

DST NIMAT Project 2019 – 20

PROFORMA FOR ACTIVITY COMPLETION STATEMENT (ACS)

(To be submitted within a week after completion of each activity)

1. Name of the Organization/ Institute : SANTHIRAM ENGINEERING COLLEGE
2. Activity/ Programme (Tick on appropriate programme) : EAC / EDP / WEDP / TEDP / FDP
3. Activity / Programme Location : SREC, NANDYAL
4. Name of the Coordinator : S.MD. FAROOQ
5. Date of Launching Promotional Activities [Not applicable for EAC] : -
6. Date of Selection (Interview) [Not applicable for EAC] : -
7. Date of Commencement of the Programme : 9.11.2019
8. Date of Completion of the Programme : 11.11.2019
9. Number of Participants : A) Total : 99
: B) Male : 47
: Female : 52
10. Category of Participants (In numbers) : General : 39
: SC : 02
: ST : 03
: OBC : 55
: Minority : -
: Others : -
11. Trade (For TEDP Only) :

Date: 16.11.2019.


Signature of Programme Coordinator


Principal
Santhiram Engineering College
NANDYAL

Annexure - III

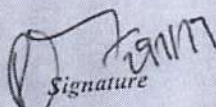
DST-NIMAT Project 2019 - 20

PROFORMA FOR STATEMENT OF AUDITED EXPENDITURE

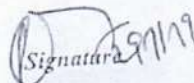
Name of the Grantee Institution : **SANTHIRAM ENGINEERING COLLEGE**
 Address : **NH-40, Neravada X' Roads, Nandyal, Kurnool Dist.**
 Sanction Letter No. & Date : **EDII | DST. NIMAT | 19-20 | 164 & 12/08/2019**
 Amount (Rs.) : **20,000/-**
 Purpose of Grant : **Entrepreneurship Awareness Camp (EAC)**

Sr. No.	Items of expenditure (in the same order as Given in terms & Conditions)	Sanctioned Expenditure	Actual Expenditure	Variation (Excess / Shortfall)	Reasons / Justification for Variation
1	2	3	4	5	6
1	Honarium to experts	5,000	5,000		
2	Travel & factory visit	4,500	5,604	1,104/-	Far away from college
3	Miscellaneous & Contingency	7,500	9,530	2,030/-	Printed material & sundries
4	Administrative overhead	3,000	3,140	140/-	Residency & generator
5					
	Total	20,000	23,274		


Total Rupees **Twenty three thousand two hundred seventy four rupees only**


 Signature
 Head of Institution
 (With rubber stamp)


 Signature
 Programme Coordinator


 Signature
 Finance &
 Accounts Officer
 of Institute
 (With rubber stamp)

P. RAJASEKHAR REDDY
 Signature
 Auditor (CA)
 (With rubber stamp)
 M.No. 245451
 UDIN : 1924545AAAAH55
RAJASEKHAR REDDY
 CHARTERED ACCOUNTANT
 M.No:245451


 Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE:: NANDYAL

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NH-40, Nandyal-518501: Kurnool Dist. A.P.

DEPARTMENT OF CSE

A report on Three day Training Program on EAC

Date : 09-11-2019 to 11-11-2019

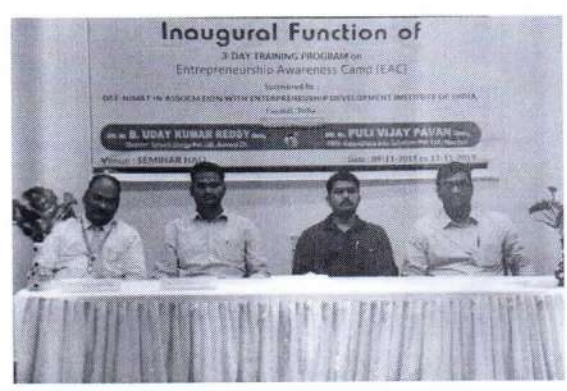
Organizing Dept. : SANTHIRAM ENGINEERING COLLEGE,
Nandyal, Kurnool Dist., AP

Resource Person : Mr.B.Uday Kumar Reddy
Director, Sprouts Energy Pvt. Ltd, Kurnool,
Mr.P.Vijay Pavan CEO,
Vasundhara Info Solutions Pvt.ltd, Nandyal


A **Three day Training Program on EAC** was organized by the Department of Computer Science & Engineering for CSE Department faculties & I- B.Tech Students. The program coordinator welcomed the gathering and delivered the felicitation address followed with Inaugural address by Principal Dr. M.V.Subramanyam garu.The Head of CSE department introduced the chief guest to the gathering followed with chief guest address delivered by Mr.B.Uday Kumar Reddy and P.Vijay Pavan



Speech by Mr. P.Vijay Pavan gaaru at Inaugural function



Dignitaries in inaugural function


Principal
Santhiram Engineering College
NANDYAL



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NH-40, Nandyal-518501: Kurnool Dist. A.P.

DEPARTMENT OF CSE

Day1 :

SESSION 1: (Timing)

First day the SESSION 1 was started at 10.45 AM and our chief guest Mr.P.Vijay Pavan ,He was clearly explained Startup and Startup Ecosystem

SESSION-II (Timing)

The second SESSION 1 was started at 2:15 and our chief guest given the orientation about the chapters. He explained Entrepreneurial Mindset

Day2 :

SESSION 1: (Timing)

Second day the SESSION 1 was started at 10.45 AM and our chief guest Mr. P.Vijay Pavan ,He was clearly explained About Creativity and Its Importance

SESSION-II (Timing)

The second SESSION 1 was started at 2:15 and our chief guest given the orientation about the chapters. He explained Importance and Need in the Country Opportunities

Day 3 :

SESSION 1: (Timing)

Third day the SESSION 1 was started at 10.45 AM and our chief guest Mr.B.Uday Kumar Reddy ,He was clearly explained Importance of Entrepreneurship

SESSION-II (Timing)

The second SESSION 1 was started at 2:15 and our chief guest given the orientation about the chapters. He explained Creativity and Its Importance

The session came to an end after long interactions from the students. After the felicitation ceremony the program ended with National Anthem in the evening.

Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE::NANDYAL

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NH-40, Nandyal – 518501:: Kurnool Dist. A.P.

DST – NIMAT PROJECT

ENTREPRENEURSHIP AWARENESS CAMP (24/10/2019 to 26/10/2019)

PROFORMA FOR POST PROGRAMME REPORT (PPR) OF EAC (Effective from 01.04.2017)

1. Name & Address of Programme : **Santhiram Engineering college**
Implementing Agency : NH-18, Nerawada 'X' Roads, Nandyal, Kurnool
Andhra Pradesh 518501
(with Tel/ Fax /E-mail) **Phone:** 085142 76123,
principal@srecnandyal.edu.in
2. Programme Location : Seminar Hall, SREC, Nandyal
3. Programme Date : From 24/10/2019 to 26/10/2019
4. Name of the Coordinator : G.SOWMYA
5. No. of candidate attended the programme : 81 (Male 49 Female 32)
6. List of participants : **ANNEXURE – I**
7. Program schedule : **ANNEXURE – II**
8. List of resource persons : **ANNEXURE – III**
9. List of industries visited : **ANNEXURE – IV**
10. Participant's feedback : **ANNEXURE – V**
11. Photographs of Programme : Enclosed

Principal
Santhiram Engineering College
NANDYAL

Annexure - II

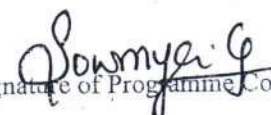
DST NIMAT Project 2019 – 2020

PROFORMA FOR ACTIVITY COMPLETION STATEMENT (ACS)

(To be submitted within a week after completion of each activity)

1. Name of the Organization/ Institute : Santhiram Engineering College
2. Activity/ Programme (Tick on appropriate programme) : EAC / EDP / WEDP / TEDP / FDP
3. Activity / Programme Location : Nandyal & Kurnool
4. Name of the Coordinator : Sowmya G
5. Date of Launching Promotional Activities [Not applicable for EAC] : NA
6. Date of Selection (Interview) [Not applicable for EAC] : NA
7. Date of Commencement of the Programme : 24/10/2019
8. Date of Completion of the Programme : 26/10/2019
9. Number of Participants : A) Total : 81
: B) Male : 49
Female : 32
10. Category of Participants (In numbers) : General : 46
SC : 6
ST : 0
OBC : 6
Minority : 23
Others : 0
11. Trade (For TEDP Only) : NA

Date: 26/10/2019

Signature of Programme Coordinator


Annexure - III


DST-NIMAT Project 2019 - 2020

PROFORMA FOR STATEMENT OF AUDITED EXPENDITURE


Name of the Grantee Institution : Santhiram Engineering College
Address : NH-18, Nerawada X'roads, Nandyal, Kurino A.P. 518501
Sanction Letter No. & Date : EDII/DST-NIMAT/19-20/164 & 12/08/2019.
Amount (Rs.) : 20,000/-
Purpose of Grant : Entrepreneurship Awareness Camp (EAC)


Sr. No.	Items of expenditure (in the same order as Given in terms & Conditions)	Sanctioned Expenditure	Actual Expenditure	Variation - (Excess / Shortfall)	Reasons / Justification for Variation
1	2	3	4	5	6
1	Honorarium to experts	5,000	5,000/-		
2	Travel & Factory Visit	4,500	5,580/-	1080/-	for away from the colleg
3	Miscellaneous & Contingency	7,500	8,450/-	950/-	Printed materiel & snack
4	Administrative overheads	3000	3,400/-	400/-	Residency for guests
5					
	Total	20,000	22,430/-	2,430/-	

Total Rupees Twenty two thousand four hundred and thirty Rupees only


Signature
Head of Institution
(With rubber stamp)


Signature
Programme Coordinator


Signature
Finance &
Accountants Officer
of Institute
(With rubber stamp)


Signature
Auditor (CA)
(With rubber stamp)
M.No. 245451
UDIN: 1924541AAMAH56

RAJASEKHAR K...
CHARTERED ACCOUNTANT
M.No:245451


Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE

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As ISO 9001:2015 Certified Institution, 2(f) & 12(B) Recognition by UGC Act, 1956
NH-40, Nandyal - 518501:: Kurnool Dist. A.P.

DEPARTMENT OF ELECTRONICS & COMMUNICATION

A report on Three day Training Program on EAC

Date : 24/10/2019 to 26/10/2019

Organizing Dept.: SANTHIRAM ENGINEERING COLLEGE, ECE
Nandyal, Kurnool Dist., AP

Resource Persons: 1. K.Somasekhar reddy General Manager, District industries sector, Kurnool
2 P. Murali Naik Chief Manager, SBI, Small & Medium Entrepreneurship branch,
Nandyal
3 P.Rajesh reddy Director, Damodhar Pvt.Ltd
Kurnool

A Three day Training Program on "ENTREPRENEURSHIP AWARENESS CAMP" was organized by the Department of Electronics and Communication Engineering Students from host institution was participated in the program. The program coordinator welcomed the gathering and delivered introduction about the importance of the programme. Later Program coordinator calls Head of the department, Principal and resource person on to the dais. After that Head of the department address the gathering next Principal spoke about importance of the Program later resource person delivered importance of gathering in the seminar hall after completion there is small tea break, and then session was handed over to the chief guest and resource person of the day.

SANTHIRAM ENGINEERING COLLEGE, NANDYAL
(Approved by AICTE, New Delhi; Permanently Affiliated to JNTUA, Ananthapuramu)
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NH-40, NANDYAL-518501:: KURNOOL DIST. A.P

Inaugural Function of
A3-DAY TRAINING PROGRAM on
Entrepreneurship Awareness Camp (EAC)

Sponsored by :
DST-NIMAT IN ASSOCIATION WITH ENTERPRENEUSHIP DEVELOPMENT INSTITUTE OF INDIA,
Gujarat, India.

Resource Persons :

SRI. K. SOMASEKHAR REDDY Genl. General Manager, District Industries Sector, Kurnool Dt.	SRI. P. MURALI NAIK Genl. SBI-SME Branch, Nandyal	SRI. P. RAJESH REDDY Genl. Director, Damodar Oil Pvt Ltd., Kurnool.
---	---	---

Venue : SEMINAR HALL
Date : 24-10-2019 to 26-10-2019.

Photo 1: Banner of the program

Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE

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NH-40, Nandyal - 518501:: Kurnool Dist. A.P.

DEPARTMENT OF ELECTRONICS & COMMUNICATION



Photo3: Participants in the program

Day3: Factory visit (Damodhar Pvt.Ltd) and experience sharing by existing entrepreneur, Feedback and discussion on the camp and factory visit.



Students at Damodhar Pvt.Ltd Factory


Principal
Santhiram Engineering College
NANDYAL


Program Coordinator

Govt/ NGO – Funded Projects

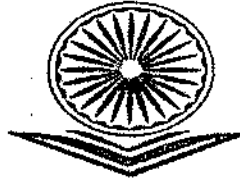
S.N	Name of the Investigator	Dept	Title of the Project	Amount Sanctioned	Name of the Agency	Gov/Non-Gov	Status of the project
1	Mr.P.Bhaksar	CSE	Efficient and Reliable Routing Protocol for Wireless Sensor Networks (WSN'S)	1L	Union Grants Commission (UGC)	Government	Rs. 0.28Lac is released on 18-12-2018 and Completed.
2	Mr.K. Rajasekhara Reddy Mr. M.Y. Veeresh	EEE	Design & implementation of String Combiner Box	2L	Sprouts Energy Private Limited	Non-Government	Rs. 1.12Lac is released on 25-03-2019 & Rs. 0.88Lac is released on 26-03-2019 and Completed.
3	Mrs.G.Sowmya Mr.C.V.Subhaskara Reddy	ECE	Design and implementation of Data Monitoring System	6.10L	Sprouts Energy Private Limited	Non-Government	Sanctioned and Rs. 2.0Lac is released on 25-03-2019, Rs. 1.90Lac is released on 26-03-2019 & Rs. 2.19Lac is released on 27-03-2019 and Completed.
4	Mrs G.Sowmya & Dr.M.V.Subramanya	ECE	LabVIEW Based Text Detection and Object Recognition Prototype for the Blind and the Dumb People	0.098L	The Institution of Engineers, India	Government	Sanctioned and Rs. 0.098Lac is released on 20-12-2018.
5	Mr. S.Nagendrudu	CSE	Design of College Maintenance Software	1.04L	Global College of Engg and Tech, Kadapa	Non-Government	Sanctioned and Rs. 1.04Lac is released on 27-03-2019 and Completed.

JM

PRINCIPAL
Santhiram Engineering College
Nandyal, Kurnool(Dt.), A.P.

Ramya
CO-ORDINATOR

**"EFFICIENT AND RELIABLE ROUTING PROTOCOL
FOR WIRELESS SENSOR NETWORKS (WSN'S)"**



ज्ञान-विज्ञान विमुक्तये

Final Report of the Minor Research Proposal

Funded by

University Grants Commission with Reference Number
(MRP-6528/16 (SERO/UGC))

By

Mr. P.BHASKAR, M.Tech.,

Principal Investigator &

Assistant Professor

Department Of Computer Science & Engineering



SANTHIRAM ENGINEERING COLLEGE

Nandyal - 518501 Kurnool (Dist.), A.P

Approved by AICTE, New Delhi; Affiliated to JNTUA, Anantapuramu.

An ISO 9001:2008 Certified Institution. 2(f) and 12(B) recognition by UGC Act, 1956.

2017-2019

Principal

**Santhiram Engineering College
NANDYAL**

www.srechandyal.com
principal_srec_x5@gmail.com
srec_nandyal@gmail.com



PH: 08514-27922
Fax: 08514-27912

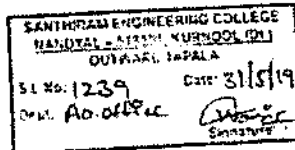
SANTHIRAM ENGINEERING COLLEGE

Dr. M. V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

9866308475



SREC/PRO/E- 11/19

Date: 12.05.2019

To

The Joint Secretary,
UGC - SERO, Hyderabad.

Respected Sir,

Sub: P.Bhaskar - PI - SREC - Nandyal A.P - Submission of Hard Copy of the Final Report of the Minor Research Proposal to UGC - Req - Reg.

Ref: UGC approval Letter No. MRP-6528-16 (MRP/UGC-SERO), Dt:26/03/2017

As per the reference cited above, I am here by sending the Final Report on the Minor Research Proposal of the Principal Investigator Mr. P.Bhaskar, topic entitled "Efficient And Reliable Routing Protocol For Wireless Sensor Networks (WSN's)" for which the amount of Rs. 95,000/- (Rupees Ninety Three Thousands only) has been sanctioned and I assure that the amount has been utilized properly only for the proposed research work.

I am here with attaching the following documents for your kind reference.

1. Annexure III, IV, V, VI
2. Annexure - A - Books and Journals
3. Annexure - B - Equipment Details
4. Annexure - C - Field Work and Travel
5. Annexure - D - Contingency
6. Annexure - E - Hiring Services
7. Bill
8. Final Report
9. Publications

Approved by AICTE, New Delhi - Permanently Affiliated to JNTUA, Anantapuram

NH - 18, NANDYAL - 515501, Kurnoor Dist. A.P.

Am ISO 9001:2008 Certified College. 2015-12 (B) Recognition by UGC Act 1956

Principal

Santhiram Engineering College
NANDYAL

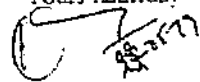
1377

Total Amount Approved	Amount Sanctioned	Total Amount Incurred	Amount Claimed
Rs. 1,00,000.00	Rs. 93,000.00	Rs. 1,06,552.00	Rs. 13,552.00

Kindly accept and sanction the claimed amount and I will be thankful to you in this regard. I take this opportunity to thank UGC for the financial grant extended to the PI for two years 2017-2019. For further clarifications please contact me over phone 09866308475.

Thanking You Sir,

Yours faithfully,



Principal

Santhiram Engineering College
NANDYAL



Principal

Santhiram Engineering College
NANDYAL

**UNIVERSITY GRANTS COMMISSION
FORMAT FOR SUBMISSION OF PROPOSAL FOR
MINOR RESEARCH PROJECT**

PART – A

1. Broad Subject : **Computer Science and Engineering**
2. Area of Specialization : **Computer Networks**
3. Duration : **Two years**

4. Principal Investigator :

- i. Name : P.Bhaskar
- ii. Sex : Male
- iii. Date of Birth : 01-06-1984
- iv. Category: (GEN/SC/ST/OBC) : SC
- v. Qualification : M. Tech
- vi. Designation : Assistant Professor
- vii. Address: Office : **Santhiram Engineering College**
Department of CSE, Nandyal,
Kurnool(Dist.),AndhraPradesh-518501.


Residence: : H.No:28-812-U1,
N.G.O.s colony,
Nandyal-518502, Kurnool (DT)

Email/Phone : bhaskar5cse@gmail.com
/+91-9908830718

5. Name of the Institution where the project will be undertaken:

- (a) Department : **Computer Science and Engineering**
- (b) College : **Santhiram Engineering College**
- (c) Affiliating University : **JNT University Anantapuramu,
Anantapuramu**
- (d) Whether the institute is located in rural/backward area : **Rural Area**

6. Whether the College is approved under Section 2 (f) and 12 B of the UGC Act?
Yes/No : **YES**


Principal
Santhiram Engineering College
NANDYAL

7. Teaching and Research Experience of Principal Investigator:

(a) Teaching experience : **PG 4 Years**
(b) Research experience :
(c) Publication : **01**

Papers Published : **01**

1. Mr. p.Bhaskar, "Highly scalable key pre-distribution scheme for wireless sensor networks " in International Journal of innovative research & development Vol-3, issue-6, June-2014 ISSN number: 2278 - 0211 (online).

Accepted : **-Nil-**
Communicated : **-Nil-**
Books Published : **-Nil-**
Accepted : **-Nil-**
Communicated : **-Nil-**

(Please enclose the list of papers and books published and/or accepted during last five years)

PART – B Proposed Research Work

8.


- (i) **Project Title: Efficient and Reliable Routing Protocol for Wireless Sensor Networks (WSNs)**

(ii) Introduction:

Sensor networks are plagued by the problems of interference to wireless communication from environmental noise, node failure and energy-constrained nodes. However, they face mote failures, RF interference from environmental noise and energy constraints. Routing protocols are overcome these problems to achieve reliability, energy efficiency and scalability in message delivery. Achievement of these requirements, however, poses conflicting demands.

(iii) Objectives:

I propose an efficient and reliable routing protocol (EAR) that achieves reliable and scalable performance with minimal compromise of energy efficiency. The routing design of EAR is based on four parameters – expected path length and a weighted combination of distance traversed, energy levels and link transmission success history, dynamically determine and maintain the best route. Simulation experiments of EAR with existing protocols demonstrate that a design based on a combination of routing demonstrate that a design based on a combination of routing parameters exhibits collectively better performance than based on just hop-count and energy of those using flooding.


Principal Investigator
Santhiram Engineering College
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(iv) Methodology:

The procedural design of EAR may be divided into three phases: setup, route selection, and data dissemination. These are detailed in the following sections.

A Setup Phase:

When a hub is powered on, it broadcasts an Advertisement (ADV) packet indicating that it wants to receive RPT packets. When a neighboring node around the hub receives this ADV packet, it will store the route to the hub in its routing table. Nodes do not propagate the ADV packet received. A node may store more than one route to the hub. A route in the routing table is indexed using the next hop node's ID – that is the ID of the neighboring node. A node keeps only one route entry for a neighbor that has route to the hub even though that neighbor could have multiple routes to the hub.

B Route Selection Phase:

Ideally, the best route is the shortest as it incurs the lowest latency and consumes the least energy. In an actual environment, the performance of an RF link varies with physical distance and terrain between nodes and should be accounted for in routing decisions. In EAR, shortest routes are initially admitted into the routing table based on hop-count. As RPT packets flow through these links, less desirable ones will start to exhibit high packet loss rate and are eventually blacklisted and omitted from the routing table. Links that are omitted from the routing table may be re-admitted again only after a period of time. Some RF links are affected by temporary external disruption and should be given the chance to be re-admitted. This allow for adaptiveness. The mechanism uses a sliding window that keeps track of the last N attempts, and then it will be blacklisted and omitted from the table.

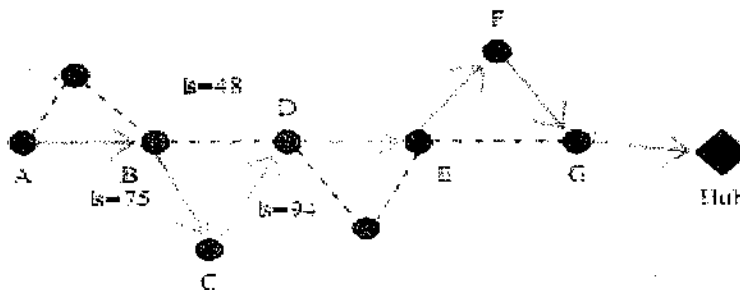


Fig: Illustration of forwarding based on *Link Score Metric*

A metric, $Link\ Score = (P_E * W_E + P_T * W_T)$, where P_E – energy level of the next of the hop node (0.0 to 100.0), W_E – assigned weight for P_E (0.0 to 1.0), P_T – transmission success rate (0.0 to 1.0). Weights, W_E and W_T , may be determined empirically but their sum must equal. Link Score is used when there are two links of different routes with the same hub distance competing to be admitted to the routine table. This is illustrated in Fig . When there is more than one entry with the same Link Score, the entry with the longest length is chosen to be replaced. If there is a tie in route length, then the route with the higher Link Score is admitted.


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Data Dissemination:

Sensor nodes generate RPT packets at periodic intervals or sleep, waiting for some event to happen. An RPT packet contains information of interest to network users and has two fields in its header: *ExpPathLen* and *NumHopTraversed*. The first field is the expected number of hops the packets will have to traverse before it reaches the hub. It is defined as $ExpPathLen = NH \times a$, where $0.0 < a < 1.0$, *NH* is the number of hops from this node to the hub for the route selected. The route selected need not be the shortest but *ExpPathLen* is bounded by the network diameter, a mini number of hops to reach the hub is at least 1.

Route Update:

Sensor nodes continually update “best” routes in the routing table. Instead of explicit control packets, EAR uses the handshaking mechanism at the MAC layer. Route information is piggybacked onto both RTS and CTS packets. Fig illustrates this scenario. Hence utilizing RTS and CTS handshaking instead of separate DATA-ACK would result in more current route information for a node.

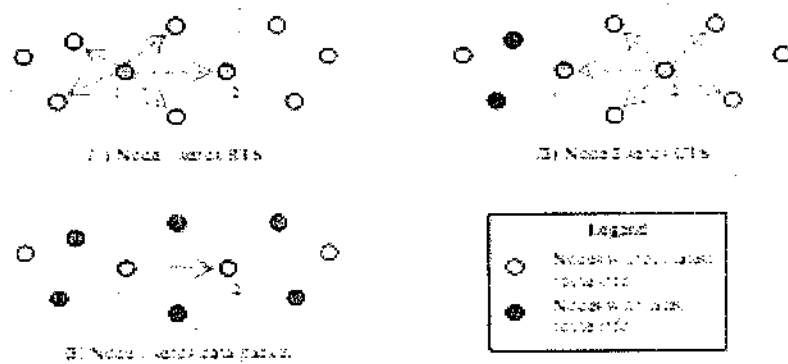
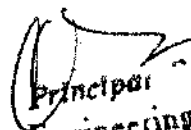


Fig: Piggy Backing on RTS/CTS packet

(v) Year-wise Plan of work and targets to be achieved.

S.No	Name of the Module	Duration
1	Literature Survey	3 Months
2	Modeling & Designing of Base Station Module	4 Months
3	Modeling & Designing of Mobile Terminal Module	4 Months
4	Simulation Results Analysis	3 Months
5	Implementation & Practical Results from the Field Work	6 Months
6	Preparation of Documentation	4 Months
Total Duration		24 Months


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9. Financial Assistance required

Item	Estimated Expenditure
i. Books and Journals	Rs. 50,000-00
ii. Equipment Cost	Rs. 2,65,000-00
iii. Field Work and Travel	Rs. 80,000-00
iv. Stationary	Rs. 20,000-00
v. Contingency (including special needs)	Rs. 55,000-00
vi. Hiring Services	Rs. 30,000-00
Total	Rs. 5,00,000-00

10. Whether the teacher has received support for the research project from the UGC under Major, Minor or from any other agency?

If so, please indicate :

-Nil-

- Name of the agency from which the assistance was approved
- Sanction letter No. and date under which the assistance was approved
- Amount approved and utilized
- Title of the project for which assistance was approved
- In case the project was completed, whether the work on the project has been published
- If the candidate was working for the doctoral degree, whether the thesis was submitted and accepted by the University for the award of degree. (A summary of the report/thesis in about 1,000 words may please be attached with the application)
- If the project has not been completed, please state the reasons

11. (a) Details of the UGC project/scheme completed or ongoing.:

-Nil-

12. Any other information which the teacher may like to give in support of this Proposal:

-No-

To certify that:

- The College is approved under Section 2(f) and 12(B) of the UGC Act and is fit to receive grants from the UGC.
- General physical facilities, such as furniture/space etc., are available in the Department/College.
- I shall abide by the rules governing the scheme in case assistance is provided to me from the UGC for the above project.
- I shall complete the project within the stipulated period. If I fail to do so and if the UGC is not satisfied with the progress of the research project, the Commission may terminate the project immediately and ask for the refund of the entire amount (with interest) released by the UGC.
- The above research Project is not funded by any other agency.

Signature of Principal Investigator

Principal

**Santhiram Engineering College
NANDYAL**

Principal

**Santhiram Engineering College
NANDYAL**



Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : SANTHIRAM ENGINEERING COLLEGE, NH-18 NANDYAL, KURN
OOL DIST, Kurnool
ALUR
ANDHRA PRADESH-518112
IN
Date : 14 Nov 2017
Account Number : 00000033245622746
Account Description : CA-GEN-PUB-OTH-RURAL-INR
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH
Drawing Power : 0.00
Interest Rate(% p.a.) : 16.7
MOD Balance : 0.00
CIF No. : 86898923696
IFS Code : SBIN0010577
MICR Code : 518002683
Nomination Registered : No
Balance as on 1 Jan 2017 : 9,743.00

Account Statement from 1 Jan 2017 to 30 Jun 2017

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
12 Mar 2017	12 Mar 2017	A/C Keeping Chgs -		99999	632.50		9,110.50
25 Mar 2017	25 Mar 2017	BY TRANSFER- INB Deposit / Investment-	IHD6153618 TRANSFER FROM 31825422233	99922		6,500.00	15,610.50
3 Apr 2017	3 Apr 2017	BY TRANSFER- NEFT*IDIB000B0 27*IDIBH1709332 5812*PRINCIPAL CHAITA-	TRANSFER FROM 3199421044306	4430		20,000.00	35,610.50
7 Apr 2017	7 Apr 2017	BY TRANSFER- NEFT*CNRB0000 606*P1704074206 5048*UNIVERSIT Y GRANTS-	TRANSFER FROM 3199414044305	4430		65,000.00	1,00,610.50
17 Jun 2017	17 Jun 2017	CHEQUE DEPOSIT-- 792086	TRANSFER TO 33086784412 / 792086	10577		1,97,455.00	2,98,065.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680854 91-34829 UGC SERO HYDERABAD	34829 UGC SERO HYDERABAD	10577	57,868.00		2,40,197.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680871 30-34824 UGC SERO HYDERABAD	34824 UGC SERO HYDERABAD	10577	31,142.00		2,09,055.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680887 14-34822 UGC SERO HYDERABAD	34822 UGC SERO HYDERABAD	10577	43,341.00		1,65,714.50

PRINCIPAL -
Santhiram Engineering College
Nandyal Kurnool/Dt.L.A.P.

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
10 Dec 2018	10 Dec 2018	CHQ TRANSFER-NEFT UTR NO: SBIN7183448 87733-34856 ELECTRONICS SECTOR SKILLS COUNCIL	/ 34856 ELECTRONICS SECTOR SKILLS COUNCIL	10577	20,005.90		4,65,238.90
18 Dec 2018	18 Dec 2018	BY TRANSFER-PFM C121805741 465 179CSCA 138369--	TRANSFER FROM 31999761052 12 /	10521		28,000.00	4,93,238.90
20 Dec 2018	20 Dec 2018	BY TRANSFER-NEFT*UTIB0 000005*AXT B1835473539 34*IOE*-	TRANSFER FROM 31996790443 02 /	4430		9,800.00	5,03,038.90

**This is a computer generated statement and does not require a signature.



Principal
Santhiram Engineering College
NANDYAL



Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : SANTHIRAM ENGINEERING COLLEGE,NH-18
NANDYAL,KURNOOL DIST,Kurnool
ALUR
ANDHRA PRADESH-518112
IN

Date : 18 Jan 2020
Account Number : 00000033245622746
Account Description : CA-GEN-PUB-OTH-RURAL-INR
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH
Drawing Power : 0.00
Interest Rate(% p.a.) : 16.7
MOD Balance : 0.00
CIF No. : 86898923696
IFS Code : SBIN0010577
MICR Code : 518002683
Balance as on 1 Jul 2019 : 17,92,952.50

Account Statement from 1 Jul 2019 to 31 Dec 2019

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
16 Aug 2019	16 Aug 2019	BY TRANSFER-PFM C081904005 934 274987- C081904005 875 179CSCA-	TRANSFER FROM 45994371052 12 /	10521		4,681.00	17,97,633.50
2 Sep 2019	2 Sep 2019	BY TRANSFER-NEFT*BARB OTRICOI*BARBR1924512 3682*STEPS KNOWLEDGE-	TRANSFER FROM 31994140443 05 /	4430		1,00,000.00	18,97,633.50
24 Sep 2019	24 Sep 2019	BULK POSTING-BY SALARY-	/	50203		1,89,720.00	20,87,353.50
1 Oct 2019	1 Oct 2019	CHEQUE WDL- TRF CHQ-34867	TRANSFER FROM 62423775910 ELECTRONICS AND ICT AC / 34867	20149	1,00,000.00		19,87,353.50


Principal
Santhiram Engineering College

ACKNOWLEDGEMENT FOR THE GRANTS RECEIVED FROM UGC-SERO, HYDERABAD

(TO BE RETURNED IMMEDIATELY ON RECEIPT OF (PFMS E-PAYMENT))

GEN/SC/ST

B-29/2018-19

**TO,
The Joint Secretary,
University Grants Commission -SERO,
4th Floor, A.P.S.F.C Building,
Chirag Ali Lane,Hyderabad -500001.**

4

Received from University Grants Commission - South Eastern Regional office,
Hyderabad a grant of Rs. 28,000/- (Rupees Twenty Eight
thousands only only)

by PFMS E-Payment Credited to our college A/c.No. 33245622746 on
in terms of Sanction No.F. MRP 6528/16 /dt. Dec 12

Under the scheme Minor research project (**GEN/SC/ST**)

Date: 26/12/18
Station: Nandyal.

Affix
Revenue stamp

Signature of the Principal

Full Name: Dr. M.V. Subramanyam

Office Seal: Santhiram Engineering College
BE, M.Tech, Ph.D., MIEE, FIETE, MISTE, MIE, MCSI
NANDYAL-518501, Kurnool (Dt.) A.P.

**(NOTE: FUTURE GRANTS TO THE COLLEGES WILL DEPEND ON RECEIPT OF THIS
ACKNOWLEDGEMENT WITHIN A WEEK ON RECEIPT OF PFMS E-PAYMENT)**

[Handwritten signature]

**Principal
Santhiram Engineering College
NANDYAL**

paid
the on
1528
728

**ACKNOWLEDGEMENT FOR THE GRANTS RECEIVED FROM UGC-SERO, HYDERABAD
(TO BE RETURNED IMMEDIATELY ON RECEIPT OF PEMS E-PAYMENT)**

GEN/SC/ST

B. 29 / 2018-19

To:
The Joint Secretary,
University Grants Commission -SERO,
4th Floor, A.P.S.F.C Building,
Chirag-All Lane, Hyderabad -500001

Received from University Grants Commission - South Eastern Regional Office
Hyderabad a grant of Rs. 4,68,111 (Rupees Four Lacs Sixty Eight Thousand One Hundred and Eleven only)
by PEMS E-Payment Credited to our college A/c No. 202001100001 on
20/08/19 in terms of Sanction No. F. 117/D-6528/18 /Ad.
Under the scheme (GEN/SC/ST)

Date: 20/08/19
Station: NANDYAL



AME
Revenue stamp

Signature of the Principal
S. Subramanian
OFFICE SEAL PRINCIPAL

(NOTE: FUTURE GRANTS TO THE COLLEGES WILL DEPEND ON RECEIVING COLLEGES
ACKNOWLEDGEMENT WITHIN A WEEK ON RECEIPT OF THE GRANTS FROM SERO)

Principal
Santhiram Engineering College
NANDYAL

Visit us : www.sreknandyal.com
Email : principal.srec.x5@gmail.com
srec.nandyal@gmail.com



Ph : 08514 - 276201
Fax : 08514 - 276123

SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/EEE/2017-18/P-15

Date: 07.06.2018

To
Sprouts Energy Private Limited,
Mittakandala Village,
Kurnool (Dist.),
Andhra Pradesh.

Dear Sir,

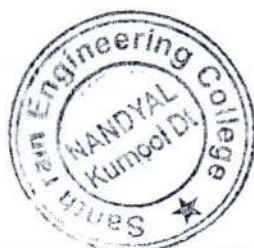
Sub: - SREC-Information about Research Activity- Design & Implementation of String Combiner Box- Reg.

Ref. No. SEPL/May/2018/12/03 - Date: 12-05-2018

As per your ref cited above, we are happy to inform that the Dept. of EEE wish to take up your project titled "**Design & Implementation of String Combiner Box**". The duration required for the implementation of boxes is 6 months and the cost per each unit is Rs.40, 000/-. We are looking forward for the project order.

Total project cost - Design & Implementation of String Combiner Box (5 units) is Rs.2,00,000/- (Two Lakh Rupees only inclusive of all taxes).

Thanking you,



(Handwritten signature)
Principal

With regards

(Handwritten signature)
Principal
Santhiram Engineering College
NANDYAL

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Email : principal.srec.x5@gmail.com
srec.nandyal@gmail.com



Ph : 08514 - 276201
Fax : 08514 - 276123

SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/EEE/2017-18/P-19

Date: 28.06.2018

To
The Head of the Department,
Electrical and Electronics Engineering,
Santhiram Engineering College,
Nandyal.

Dear Sir,

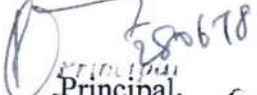
Sub:-Information about Research Project 'Design & Implementation of String Combiner Box'- Reg.

It is bringing to your notice that, the SREC has accepted & willing to do the research activity with Sprouts Energy Private Limited for the Project Titled "Design & Implementation of String Combiner Box". As per our discussion, based on the expertise, assign this research project to the Mr.K. Rajasekhara Reddy, Assistant Professor and Mr. M.Y.Veeresh, Assistant Professor, Dept.of EEE. The project duration is 6 months. You are informed to complete this project before the due date and also informed to demonstrate it.

Thanking you,

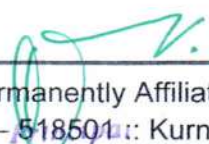


With regards


Principal,
Santhiram Engineering College
NANDYAL

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NH - 18, NANDYAL – 518501 : Kurnool Dist, A.P.

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Phone: 08514-276201
Cell No: 9705765566



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Lr. No: SREC/EEE/R&D/2018-19/P-04

Date: 12.01.2019

To
The Principal,
Santhiram Engineering College,
Nandyal.

Dear Sir,

Sub: SREC-EEE-Report related to completion of the research project-Reg.

We have successfully completed the research project entitled "**Design & Implementation of String Combiner Box**" with the help of Mr.K. Rajasekhara Reddy, Assistant Professor and Mr. M.Y.Veeresh, Assistant Professor, Dept of EEE in 6 months.

The model according to Sprouts Energy Private Limited specifications is enclosed.

Thank you Sir,

With regards

HEEED

Enclosed: Project Report and Kit.

Principal
Santhiram Engineering College
NANDYAL



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Report on

Design and Implementation of String Combiner Box

Introduction:

In Photovoltaic based solar power plant system, the modules are arranged in strings depending upon the total power, inverter used and technical characteristics of the module. The string combiner box (SBC) accommodates over-current protection devices, disconnectors and surge protection devices. The string combiner boxes form subsystems that can be designed according to number of strings, voltage and current ratings.

Benefits:

- Solar string combiners improve safety of solar panels and the entire photovoltaic plant.
- Solar combiner box, also called DC switchboard, fuse disconnectors with fuse links, surge protective devices and switch disconnectors.
- Combiner box solutions for all residential, commercial and utility-scale applications with single string.
- Solar string combiners are built body are having great mechanical strength.
- Protection against dust, heavy seas or powerful jets of water, chemicals and high UV rays.

Design and Specification:

The Sprouts Energy Private Limited solar power plant is having a capacity of 2MW. A single solar panel is of 310W capacity with open circuit voltage of 40V and a current rating of 8.2A. A 20 number of such solar panel are connected in series to form as a string of power capacity of $310W \times 20 = 6.2KW$ with voltage of 800V and current of 8.2A. One such 24 strings are connected in parallel to form as a block of power capacity of $6.2KW \times 24 = 148.8KW$ with a voltage rating of 800V and a current rating of 196.8A.

A string combiner box is designed based on the above rating required. In this design, a total of 24 positive output pins and 24 negative output pins are coming out from a 24 string block. The 24 positive pins are reduced to 12 positive pins through a T or Y or branch connectors before the string combiner box. Similarly, the 24 negative pins to 12 negative pins are taken out from Y connectors.



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Therefore, from the above inputs, a string combiner box is designed for a 1000V, 200A, 12 port positive and negative input pins. The requirement of string combiner boxes of 5 in quantity are identical in design and specifications. The specifications used in each of the SBC are as follows.

S. No.	Item Description	Make	Part no.	Qty.
1	FRP material Enclosure Box 548 (H) x 650 (W) x 250 (D) mm approx. with IP65, IK 10 rating.	Allied enclosure USA	AM24208IRLS	1
2	Bakelite material Mounting Base plate 460 (H) x 560 (W) x 5 (D) mm.	Reputed Make	-	1
3	DC disconnecter Switch (1000V, DC 400A, 2P).	Socomec / ABB / Telergon	26PV2039	1
4	PV Fuses (1000V, 30A) with fuse holder (1000V, 30/32A).	Mersen / Little Fuse / elmex	HP10M30 / USM1HEL	12 set
5	Surge Protection (SPD, type 2), 1000V, DC	Dehn	950535	1
6	Earth terminal Block.	Elmex / Connectwell	ET 16/CGT16U	1
7	Pressure Equalizer / Ventilation device (M12).	Ortac / reputed make	OMVPBL01UHL	4
8	Box side female MC4 Connectors 1000V DC rated.		32.0078P0001-UR	12
9	Box side Male MC4 Connectors 1000V DC rated.		32.0079P0001-UR	12
10	Field side Female MC4 Connectors 1000V DC rated.		32.0016P0001-UR	12
11	Field side Male Connectors 1000V DC rated.		32.0017P0001-UR	12
12	Polyamide cable gland (IP 68), M20	Ortac / reputed make	OMRB04	1
13	Polyamide cable gland (IP 68), M40, (clamping range- Ø22-Ø32mm).	Ortac / reputed make	OMRB08	2
14	+ve copper tinned bus bar (250x40x5mm). +/- 5mm.		-	1
15	-ve copper tinned bus bar (155x40x5mm). +/- 5mm.		-	1
16	Spreader links copper tinned (75x40x5mm). +/- 5mm.		-	2
17	Copper flexible cable for string input 6sqmm	Apar / reputed	-	1 set

Visit us: www.sreknandyal.edu.in
Email : hod.eee@sreknandyal.edu.in

Phone: 08514-276201
Cell No: 9705765566



SANTHIRAM ENGINEERING COLLEGE : NANDYAL

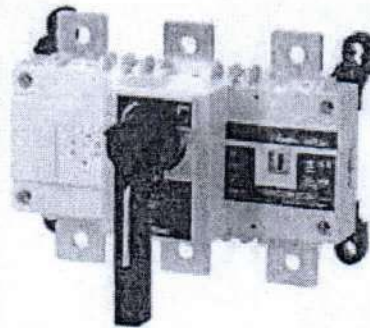
Approved by AICTE, New Delhi: Permanently Affiliated to JNTUA, Ananthapuramu
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NH-40, Nandyal-518501:: Kurnool Dist . A. P.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

18	16sqmm SPD Cables	make Apar/reute d make	-	1 set
19	Internal wiring diagram (SLD).	-	-	1
20	Enclsoure mounitng channel with Box side hardware.	Allied enclosure USA	-	4 set
21	Acrylic sheet for live part protection.	Reputed Make	-	1 set
22	Output hardware M12x40 with Nut, Plain washer & spring washer.	Reputed Make	-	2 set
23	Other Accessories (Insulater, sticker, Din Rail, Lugs, etc.)	Reputed Make	-	1 set

Some of the Main Component of SBC:

DC Disconnect Switch:



A 2 pole, 400 Ampere rated current and 1000V DC Voltage Disconnect switch is employed in the SBC.

PV Fuse Holder:



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A 30 Ampere, 1000 Volts Solar PV Fuse Holder is used in the SBC.

Visit us: www.sreknandyal.edu.in
Email : hod.eee@sreknandyal.edu.in

Phone: 08514-276201
Cell No: 9705765566

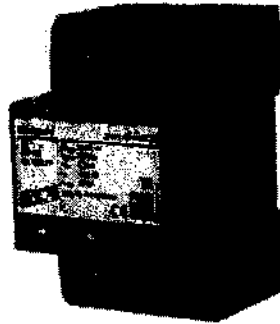


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NH-40, Nandyal-518501:: Kurnool Dist . A. P.

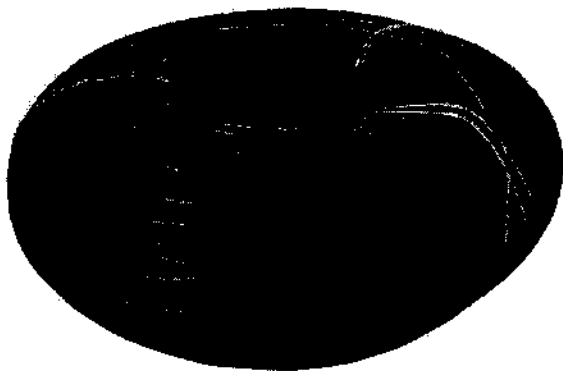
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Surge Protection:

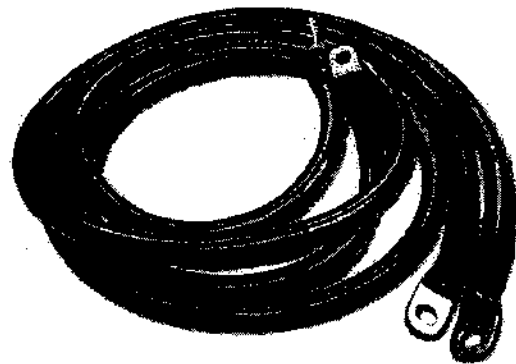


A type 2, Surge protection device of 1000V is employed in the SBC.

Cables:



A 6sq.mm Copper flexible cable used in SBC.



A 16sq.mm Surge Protection for string input Cable used in SBC.

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Photo 1: The complete make model of string combiner box.

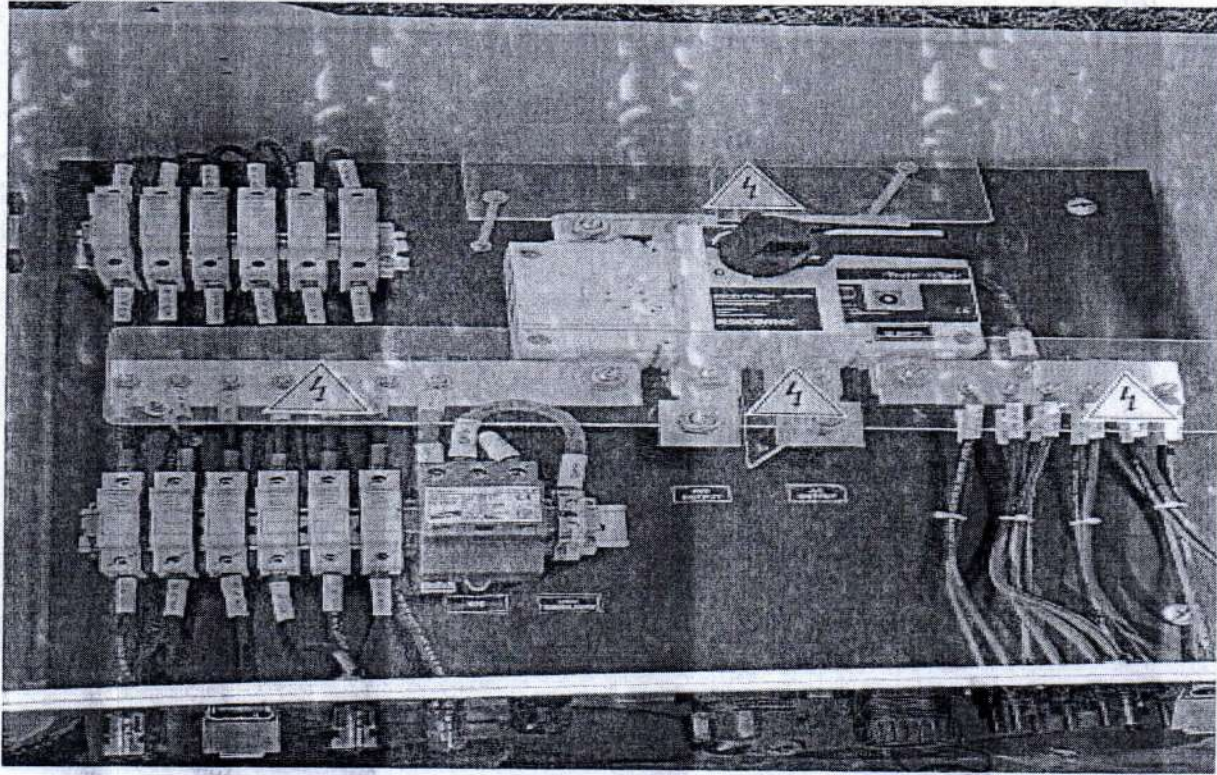
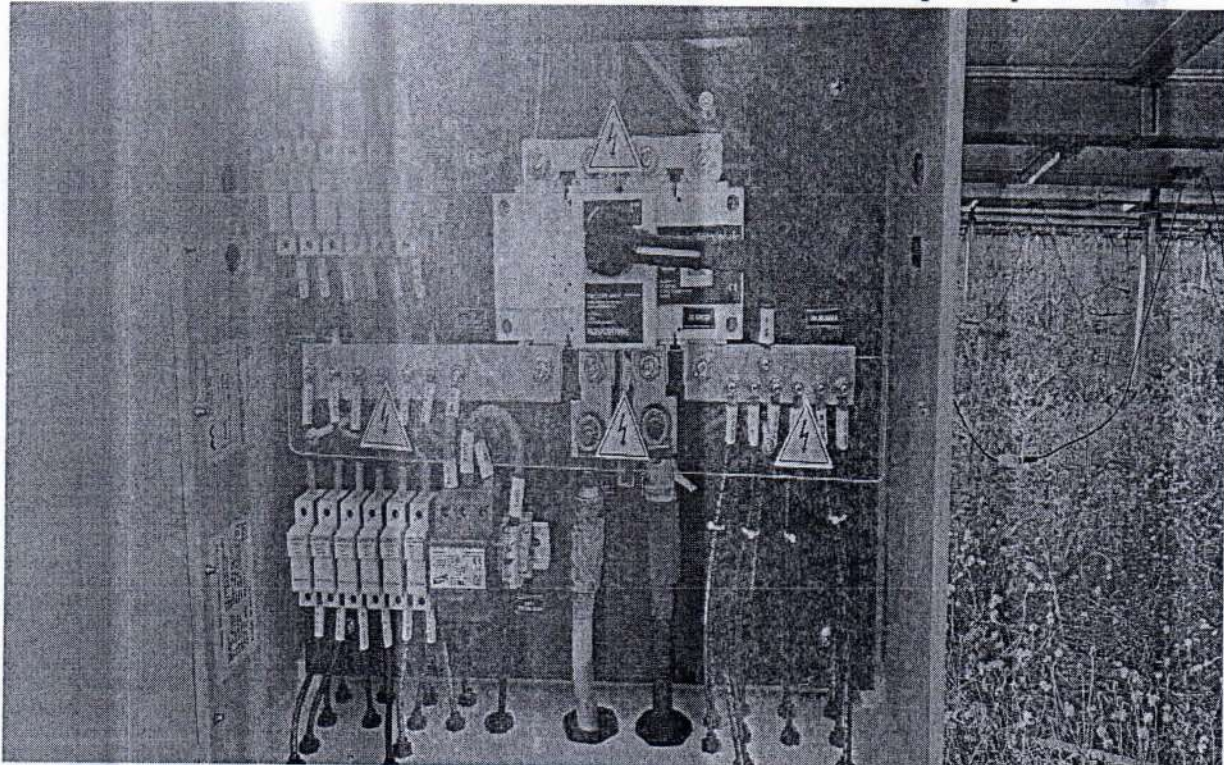


Photo 2: The SBC is built in the Sprouts Energy Private Limited solar power plant.



Note: The single line diagram of wiring connections of string combiner box are arranged as per the diagram shown in figure 1.



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Wiring Diagram:

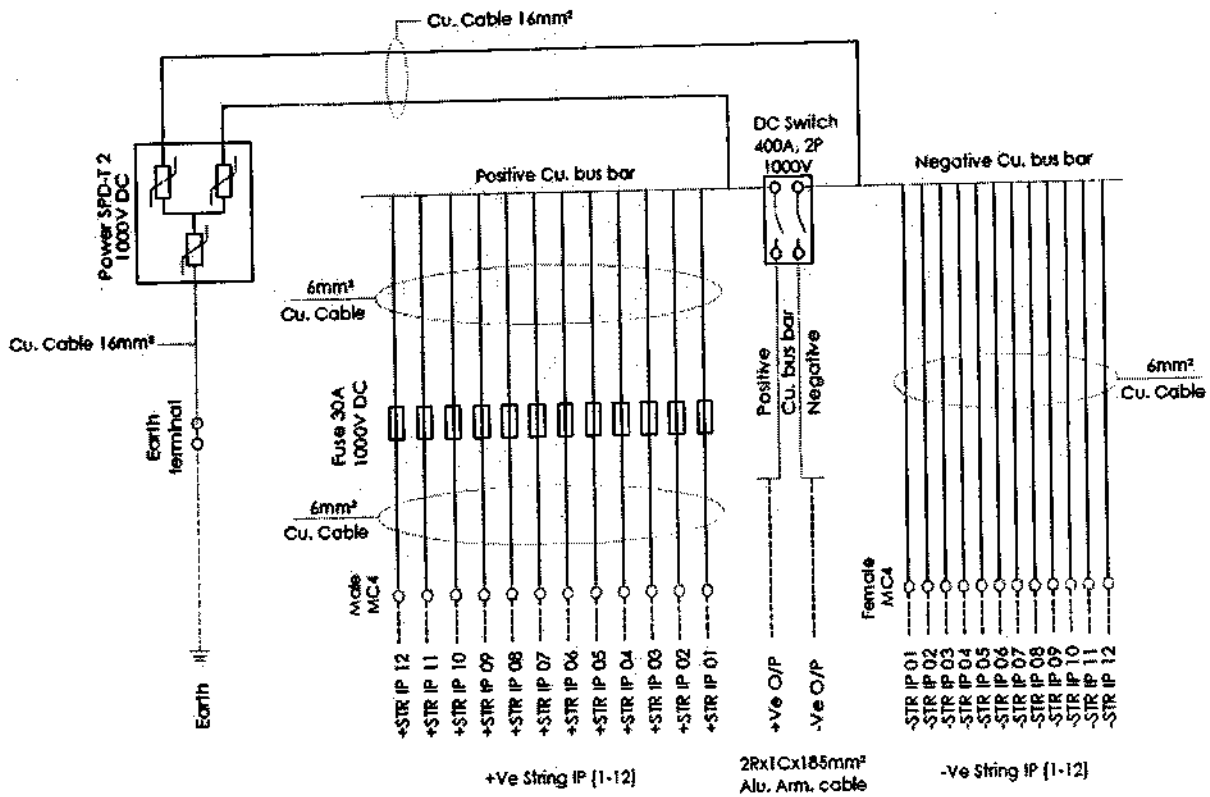


Figure 1: Single Line Diagram of Wiring of String Combiner Box

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Email : principal.srec.x5@gmail.com
srec.nandyal@gmail.com



Ph : 08514 - 276201
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Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/EEE/2018-19/P-02

Date: 17/01/2019

To
Sprouts Energy Private Limited,
Mittakandala Village,
Kurnool (Dist.),
Andhra Pradesh.

Dear Sir,

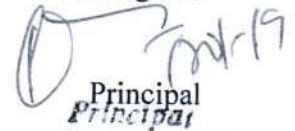
Sub: Submission of Research Project Kits and request to release the due for the Research Activity-Reg.

Ref. No.: SEPL/June/2018/25/02 - Date: 25-06-2018

I wish to confirm you that the research project kits "String Combiner Box-05 units" are given to your client. Please sanction the amount of Rs.2,00,000/- (Two Lakh Rupees Only) at the earliest.

Thanking you,

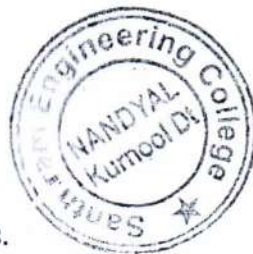
With regards


Principal

Santhiram Engineering College
NANDYAL

Enclosures:

Project Report and kits.





Sprouts Energy Pvt. Ltd.

Lr. No. SEPL/March/2019/28/03

Date: 28-03-2019

To
The Principal,
Santhiram Engineering College,
Nandyal, Kurnool, A.P.

Dear Sir,

Sub: Payment of Research Project "Design and Implementation of String Combiner Box" - reg
Ref. No: SREC/PRO/R&D/EEE/2018-19/P-02, Dt: 17.01.2019.

----XXX----

I wish to inform you that the modules are working properly, and your team is continuously monitoring and supporting. I am happy to inform you that the total amount of the project of **Rs.2,00,000/- (Two Lakh Rupees only)** was paid as per the details given below.

S.No.	Date	Cheque Number	Amount
1.	25-03-2019	777148	Rs. 1,12,000/-
2.	26-03-2019	777149	Rs. 88,000/-
Total			Rs. 2,00,000/-

I request you to support us in future for any requirements and to verify the accounts.

Thanking you

From Sprouts Energy Private Limited




Authorized Signature

#401, Indra Imperia, Above Yes Bank, Ramanthapur, Hyderabad – 500

013, Ph: 8309154730

Principal

Santhiram Engineering College
NANDYAL



Date : 20 Jan 2020
 Account Number : 00000030353702437
 Description : CA-GEN-PUB-IND-RURAL-INR
 Name : **SANTHIRAM ENGINEERING COLLEGE**
 Currency : INR
 Corporate Address : NERAWADA
 : NANDYAL
 : AP-518113
 Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH(10577)
 Rate of Interest (% p.a.) : 16.7%
 IFS Code : SBIN0010577
 Book Balance : 132732.36
 Available Balance : 132732.36
 Hold Value : 0.00
 MOD Balance : 0.00
 Uncleared Amount : 0.00
 Balance as on 1 Jan 2019 : 1,57,467.31

Account Statement from 1 Jan 2019 to 30 Jun 2019

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
02/01/2019	02/01/2019	TO TRANSFER-INB FILTER SHEET TO AO OFFICE TOPPERS LIST-CTE7951365 TRANSFER TO 31802094635 Mr. MATTAM NARESH-	CTE7951365 TRANSFER TO 31802094635 Mr. MATTAM NARESH / -	99922	2,000.00		1,55,467.31
02/01/2019	02/01/2019	TO TRANSFER-INB MATHS DAY CELEBRATIONS -2018- CTE7951426 TRANSFER TO 33513087634 HOD- BS, SREC-	CTE7951426 TRANSFER TO 33513087634 HOD- BS, SREC / -	99922	59,272.00		96,195.31
02/01/2019	02/01/2019	TO TRANSFER-INB DIESEL BILL FOR COLLEGE VEHICLES AND GEN- CTE7950884 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	CTE7950884 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	42,584.00		53,611.31
05/01/2019	05/01/2019	TO TRANSFER-INB ECE DEPT IMPREST EXPENDITURE-CTE8247331 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247331 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	1,800.00		51,811.31
05/01/2019	05/01/2019	TO TRANSFER-INB helix ultra5w40-4l-CTE8246856 TRANSFER TO 33512454982 HOD, ME- SREC-	CTE8246856 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	4,200.00		47,611.31
05/01/2019	05/01/2019	TO TRANSFER-INB TRAVELLING EXPENDITURE TO HECE AND HCSE- CTE8247180 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247180 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	3,770.00		43,841.31
05/01/2019	05/01/2019	TO TRANSFER-INB MINI PROJECT KIT TO ECE- CTE8247063 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247063 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	36,000.00		7,841.31
05/01/2019	05/01/2019	BY TRANSFER-CLOSERE- TRANSFER FROM 37701060164 SANTHIRAM ENGINEERING-	TRANSFER FROM 37701060164 SANTHIRAM ENGINEERING / -	10577		7,73,681.00	7,81,522.31
05/01/2019	05/01/2019	BY TRANSFER-CLOSERE- TRANSFER FROM 37829919826 SANTHIRAM ENGINEERING-	TRANSFER FROM 37829919826 SANTHIRAM ENGINEERING / -	10577		10,21,489.00	18,03,011.31


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Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
23/03/2019	23/03/2019	TO TRANSFER-INB BS DEPT LAB EXPENDITURE-CTF511129 TRANSFER TO 33513087634 HOD- BS, SREC-	CTF511129 TRANSFER TO 33513087634 HOD- BS, SREC / -	99922	2,428.00		1,11,714.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33681894394-777387	TRANSFER TO 33681894394 / 777387	10577		6,000.00	1,17,714.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 30840553455-863472	TRANSFER TO 30840553455 / 863472	10577		13,020.00	1,30,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634-972042	TRANSFER TO 33513087634 / 972042	10577		44,000.00	1,74,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715-937550	TRANSFER TO 33512370715 / 937550	10577		1,98,000.00	3,72,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513089347-777148	TRANSFER TO 33513089347 / 777148	10577		1,12,000.00	4,84,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975-777252	TRANSFER TO 33604045975 / 777252	10577		2,00,000.00	6,84,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982-54695	TRANSFER TO 33512454982 / 54695	10577		1,88,000.00	8,72,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 10826488552-106268	TRANSFER TO 10826488552 / 106268	10577		10,00,000.00	18,72,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513089347-777149	TRANSFER TO 33513089347 / 777149	10577		88,000.00	19,60,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634-972043	TRANSFER TO 33513087634 / 972043	10577		41,000.00	20,01,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715-100854	TRANSFER TO 33512370715 / 100854	10577		1,98,000.00	21,99,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982-54696	TRANSFER TO 33512454982 / 54696	10577		1,90,000.00	23,89,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975-777253	TRANSFER TO 33604045975 / 777253	10577		1,90,000.00	25,79,734.33
26/03/2019	26/03/2019	BY TRANSFER-INB FUND TRANSFER-CTF5291662 TRANSFER FROM 37296299778 SANTHIRAM ENGINEERING-	CTF5291662 TRANSFER FROM 37296299778 SANTHIRAM ENGINEERING / -	99922		50,000.00	26,29,734.33
26/03/2019	26/03/2019	BY TRANSFER-INB FUND TRANSFER-CTF5292133 TRANSFER FROM 37296630804 SANTHIRAM ENGINEERING-	CTF5292133 TRANSFER FROM 37296630804 SANTHIRAM ENGINEERING / -	99922		50,000.00	26,79,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB ADVANCE TOBUSES-CTF5291624 TRANSFER TO 62289702577 Mr. NAYAB SHAIK ANWAR-	CTF5291624 TRANSFER TO 62289702577 Mr. NAYAB SHAIK ANWAR / -	99922	50,000.00		26,29,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB DIESEL BILL FOR COLLEGE VEHICLES-CTF5307098 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTF5307098 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	1,00,000.00		25,29,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB TRAVELLING EXPENDITURE TO VIJAYAWADA-CTF5306058 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTF5306058 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	5,864.00		25,23,870.33
26/03/2019	26/03/2019	TO TRANSFER-INB IMPREST AMOUNT TO MBA DEPT-CTF5306515 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF5306515 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	1,005.00		25,22,865.33
26/03/2019	26/03/2019	TO TRANSFER-INB IT FOR 2017-18-CTF5306621 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING-	CTF5306621 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING / -	99922	24,00,000.00		1,22,865.33
26/03/2019	26/03/2019	CASH DEPOSIT-CASH DEPOSIT SELF--	- / -	10577		2,300.00	1,25,165.33
27/03/2019	27/03/2019	TO TRANSFER-INB MANAGEMENT MEET BY MBA DEPT-CTF5372974 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF5372974 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	16,670.00		1,08,495.33
27/03/2019	27/03/2019	TO TRANSFER-INB CARPENTRY MATERIAL FOR NEW BLOCK-CTF5372271 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5372271 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	7,140.00		1,01,355.33

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srec.nandyal@gmail.com



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Fax : 08514 - 276123

SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/ECE/2018-19/P-17

Date:16.08.2018

To

Sprouts Energy Private Limited,
Mittakandala Village,
Kurnool (Dist.),
Andhra Pradesh.

Dear Sir,

Sub: - SREC-Information about Research Activity-Design and Implementation of Data monitoring System -Reg.

Ref. No. SEPL /August/2018/06/06 - Date: 06-08-2018

As per your ref cited above we are happy to inform that the Dept of ECE wish to take up your project titled "**Design and Implementation of Data monitoring System**". The duration required for the implementation of kits is 6 months and the cost per each unit is Rs 43,500/-(Forty three thousand and five hundred rupees only). We are looking forward for the project order.

Total Project cost - Design and Implementation of Data monitoring System (14 units) is 6,09,000/-(Six lakh nine thousand rupees only inclusive all taxes).

Thank you,



Principal

Santhiram Engineering College

With regards

Principal

Santhiram Engineering College

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Fax : 08514 - 276123

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Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

LF. No: SREC/PRO/R&D/ECE/2018-19/P-25

Date:27-08-2018

To
The Head of the Department,
Electronics & Communication Engineering,
Santhiram Engineering College,
Nandyal.

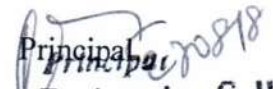
Dear Sir,

Sub: - SREC- Information about Research Project "Design & Implementation of Data monitoring System" -Reg.

It is bringing to your notice that, the SREC has accepted & willing to do the research activity with Sprouts Energy Private Limited for the Project Titled "Design & Implementation of Data monitoring System". As per Our Discussion based on the expertise assign this research project to the Mrs.G.Sowmya, Assistant Professor and Mr.C.V.SubhaskarReddy, Assistant Professor, Dept of ECE. The Project Duration is 6 months. You are informed to complete this project before the due date and also informed to demonstrate it.




Principal
Santhiram Engineering College
NANDYAL


Principal
Santhiram Engineering College
NANDYAL



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DEPARTMENT OF ELECTRONICS & COMMUNICATION

Lr. No: SREC/ECE/R&D/2018-19/P-08

Date: 06/02/2019

To
The Principal,
Santhiram Engineering College,
Nandyal.

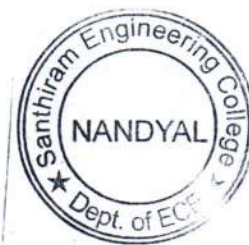
Dear Sir,

Sub: SREC-ECE-Report related to completion of the research project-Reg.

We have successfully completed the research project entitled "Design and implementation of Data Monitoring System" with the help of Mrs.G.Sowmya, Assistant Professor and Mr.C.V.Subhaskar reddy, Assistant Professor, Dept of ECE in 6months.

. The model according to Sprouts Energy Private Limited specifications is enclosed.

Thank you sir,



With regards,

[Signature]
HECE
06/02/19

HO-D-Dept. of ECE
Santhiram Engineering College
Nandyal, Kurnool(Dt) A.P

Enclosed: Project Kits and Report

[Signature]
Principal
Santhiram Engineering College
NANDYAL



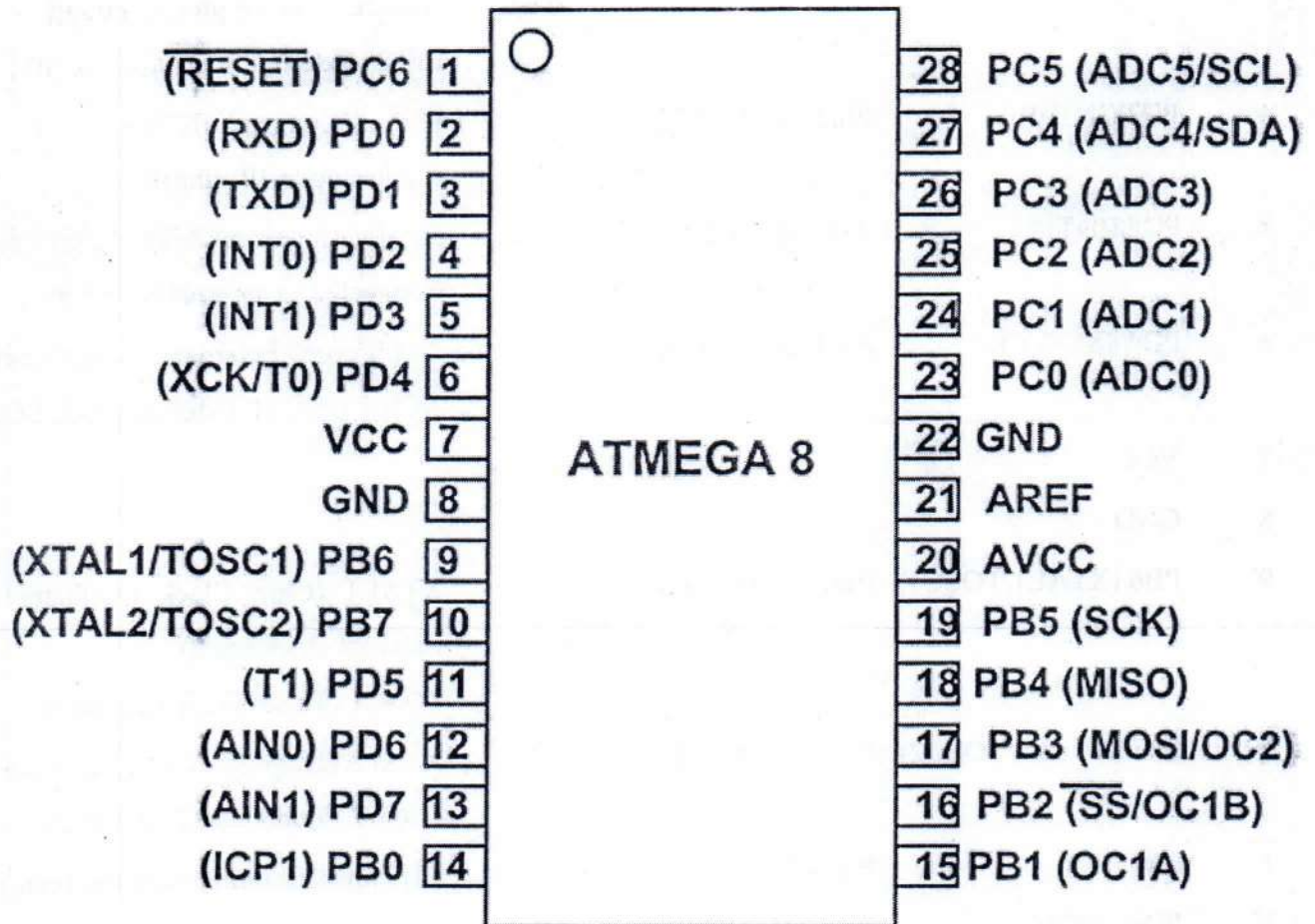
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DEPARTMENT OF ELECTRONICS & COMMUNICATION

Design and implementation of Data Monitoring System

Data monitoring system-15 units all are having same specifications. Each control panel fixed and monitored using this system. Data monitoring is done with the help of different types of sensors like IR Sensor, Air quality sensor, temperature sensor and circuit breakage sensor. The sensors are connected to ATMEGA controller



1	PC6 (RESET)	Pin6 of PORTC	Pin by default is used as RESET pin. If the RSTDISBL Fuse is programmed, PC6 can be used as an I/O pin. (Pulled HIGH to RESET controller)
2	PD0 (RXD)	Pin0 of PORTD	RXD (USART Input Pin) (circuit breakag



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			sensor) USART Serial Communication Interface [Can be used for programming]
3	PD1 (TXD)	Pin1 of PORTD	TXD (USART Output Pin) connecte panell output USART Serial Communication Interface [Can be used for programming] INT2(External Interrupt 2 Input)
4	PD2 (INT0)	Pin2 of PORTD	External Interrupt INT0 Connected to IR sensor
5	PD3 (INT1)	Pin3 of PORTD	External Interrupt INT1 Connected to air quality sensor
6	PD4 (XCK/T0)	Pin4 of PORTD	T0(Timer0 External Counter Input) XCK (USART External Clock I/O)
7	VCC		
8	GND		
9	PB6 (XTAL1/TOSC1)	Pin6 of PORTB	XTAL1 (Chip Clock Oscillator pin 1 c External clock input) TOSC1 (Timer Oscillator pin 1)
10	PB7 (XTAL2/TOSC2)	Pin7 of PORTB	XTAL2 (Chip Clock Oscillator pin 2) TOSC2 (Timer Oscillator pin 2)
11	PD5 (T1)	Pin5 of PORTD	T1(Timer1 External Counter Input)
12	PD6 (AIN0)	Pin6 of PORTD	AIN0(Analog Comparator Positive I/P)
13	PD7 (AIN1)	Pin7 of PORTD	AIN1(Analog Comparator Negative I/P)
14	PB0 (ICP1)	Pin0 of PORTB	ICP1(Timer/Counter1 Input Capture Pin)
15	PB1 (OC1A)	Pin1 of PORTB	OC1A (Timer/Counter1 Output Compar Match A Output)



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DEPARTMENT OF ELECTRONICS & COMMUNICATION

Panel monitoring can be observed using LCD display according to the data displayed control panel will be controlled.

IR Sensor: An infrared sensor is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measure only infrared radiation, rather than emitting it that is called a passive IR sensor.

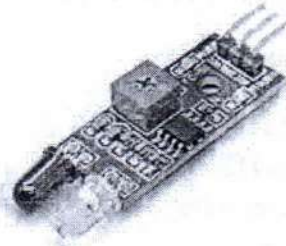
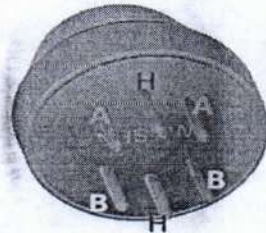
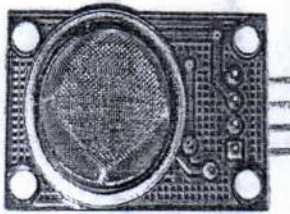


Fig : IR sensor

MQ-135 - Gas Sensor for Air Quality:



Pin No.	Pin Name
1	Vcc(+5V)
2	Ground
3	Digital Out
4	Analog out

Fig: Air quality sensor

Here we use the digital pin or the analog pin to do this. Simply power the module with 5V and you should notice the power LED on the module to glow and when no gas it detected the output LED will remain turned off meaning the digital output pin will be 0V. Remember that these sensors have to be kept on for pre-heating time (mentioned in features above) before you can actually work with it.

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Temperature Sensor :

The temperature sensor is a loop-powered sensor which accurately converts the measured temperature to a 4-20 milliamp signal, which can be monitored by the display.



Fig: Temperature sensor

Temperature sensor Specifications

Selectable input current range: 0 - 10, 0 - 20, and 0 - 40 amps

• Power supply voltage: 12 - 30 volts DC •

Current accuracy: +/-2% from 10% to 100% of full scale

• Temperature range: -40 °C to 120 °C

Circuit Breakage:

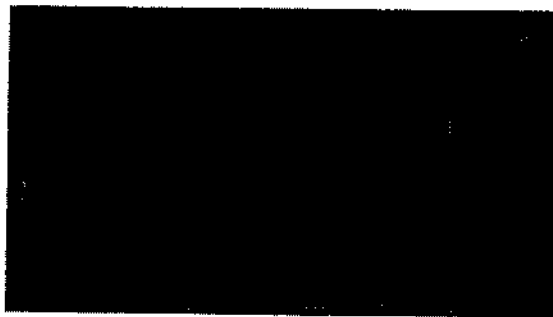


Fig : Breakage circuit Module

If any circuit breakage is present in control panel then the indication is done with the help of buzzer.

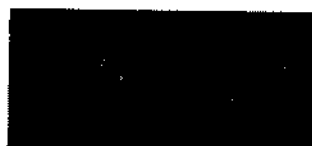


Fig: Buzzer Module



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16	PB2 (SS/OC1B)	Pin2 of PORTB	SS (SPI Slave Select Input). This pin is low when controller acts as slave. [Serial Peripheral Interface (SPI) for programming] OC1B (Timer/Counter1 Output Compare Match B Output)
17	PB3 (MOSI/OC2)	Pin3 of PORTB	MOSI (Master Output Slave Input). When controller acts as slave, the data is received by this pin. [Serial Peripheral Interface (SPI) for programming] OC2 (Timer/Counter2 Output Compare Match Output)
18	PB4 (MISO)	Pin4 of PORTB	MISO (Master Input Slave Output). When controller acts as slave, the data is sent to master by this controller through this pin. [Serial Peripheral Interface (SPI) for programming]
19	PB5 (SCK)	Pin5 of PORTB	SCK (SPI Bus Serial Clock). This is the clock shared between this controller and other system for accurate data transfer. [Serial Peripheral Interface (SPI) for programming]
20	AVCC		Vcc for Internal ADC Converter
21	AREF		Analog Reference Pin for ADC
22	GND		GROUND
23	PC0 (ADC0)	Pin0 of PORTC	ADC0 (ADC Input Channel 0)
24	PC1 (ADC1)	Pin1 of PORTC	ADC1 (ADC Input Channel 1)
25	PC2 (ADC2)	Pin2 of PORTC	ADC2 (ADC Input Channel 2)
26	PC3 (ADC3)	Pin3 of PORTC	ADC3 (ADC Input Channel 3)



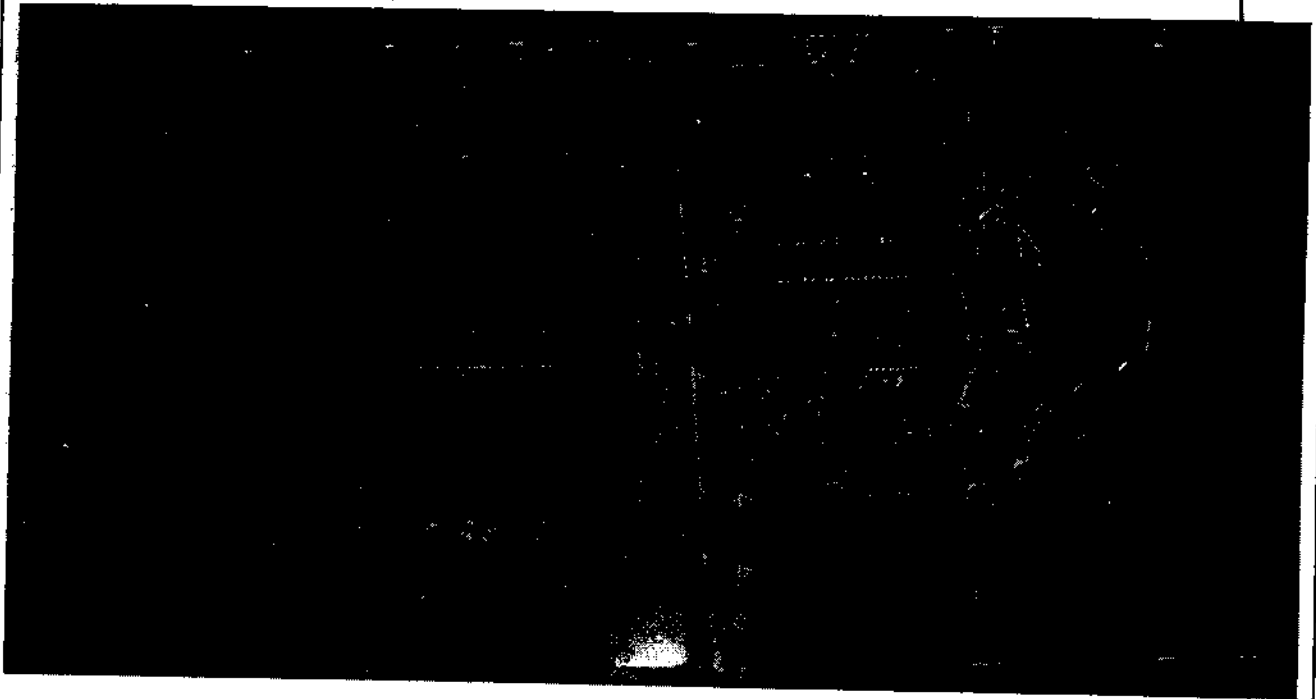
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27	PC4 (ADC4/SDA)	Pin4 of PORTC	ADC4 (ADC Input Channel 4) SDA (Two-wire Serial Input/Output Line)	Bus	Dat
28	PC5 (ADC5/SCL)	Pin5 of PORTC	ADC5 (ADC Input Channel 5) SCL (Two-wire Serial Bus Clock Line)		

Module for Data Monitoring System using ATMEGA Controller



Visit us : www.srecnandyal.com
Email : principal.srec.x5@gmail.com
srec.nandyal@gmail.com

Ph : 08514 - 276201
Fax : 08514 - 276123



SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/ECE/2018-19/P-42

Date: 08-02-2019

To

Sprouts Energy Private Limited,
Mittakandala Village,
Kurnool (Dist.),
Andhra Pradesh.

Dear Sir,

Sub: Submission of Research Project Kits and request to release the due for the Research Activity-Reg.

Ref .No. SEPL /August/2018/24/11- Date: 24-08-2018

I wish to confirm you that the research project kits "Data Monitoring System- 14 units" are given to your client. Please sanction the amount of Rs.6,09,000/- (Six Lakh Nine Thousand Rupees Only) at the earliest.

Thanking you,



With regards


Principal

Santhiram Engineering College
NANDYAL

Enclosures:

Project Report and kits.


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Date : 20 Jan 2020
Account Number : 00000030353702437
Description : CA-GEN-PUB-IND-RURAL-INR
Name : **SANTHIRAM ENGINEERING COLLEGE**
Currency : INR
Corporate Address : NERAWADA
NANDYAL
AP-518113
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH(10577)
Rate of Interest (% p.a.) : 16.7%
IFS Code : SBIN0010577
Book Balance : 132732.36
Available Balance : 132732.36
Hold Value : 0.00
MOD Balance : 0.00
Uncleared Amount : 0.00
Balance as on 1 Jan 2019 : 1,57,467.31

Account Statement from 1 Jan 2019 to 30 Jun 2019

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
02/01/2019	02/01/2019	TO TRANSFER-INB FILTER SHEET TO AO OFFICE TOPPERS LIST-CTE7951365 TRANSFER TO 31802094635 Mr. MATTAM NARESH-	CTE7951365 TRANSFER TO 31802094635 Mr. MATTAM NARESH / -	99922	2,000.00		1,55,467.31
02/01/2019	02/01/2019	TO TRANSFER-INB MATHS DAY CELEBRATIONS -2018- CTE7951426 TRANSFER TO 33513087634 HOD- BS, SREC-	CTE7951426 TRANSFER TO 33513087634 HOD- BS, SREC / -	99922	59,272.00		96,195.31
02/01/2019	02/01/2019	TO TRANSFER-INB DIESEL BILL FOR COLLEGE VEHICLES AND GEN- CTE7950884 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	CTE7950884 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	42,584.00		53,611.31
05/01/2019	05/01/2019	TO TRANSFER-INB ECE DEPT IMPREST EXPENDITURE-CTE8247331 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247331 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	1,800.00		51,811.31
05/01/2019	05/01/2019	TO TRANSFER-INB helix ultra5w40-4l-CTE8246856 TRANSFER TO 33512454982 HOD, ME- SREC-	CTE8246856 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	4,200.00		47,611.31
05/01/2019	05/01/2019	TO TRANSFER-INB TRAVELLING EXPENDITURE TO HECE AND HCSE- CTE8247180 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247180 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	3,770.00		43,841.31
05/01/2019	05/01/2019	TO TRANSFER-INB MINI PROJECT KIT TO ECE- CTE8247063 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247063 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	36,000.00		7,841.31
05/01/2019	05/01/2019	BY TRANSFER-CLOSERE- TRANSFER FROM 37701060164 SANTHIRAM ENGINEERING-	TRANSFER FROM 37701060164 SANTHIRAM ENGINEERING / -	10577		7,73,681.00	7,81,522.31
05/01/2019	05/01/2019	BY TRANSFER-CLOSERE- TRANSFER FROM 37829919826 SANTHIRAM ENGINEERING-	TRANSFER FROM 37829919826 SANTHIRAM ENGINEERING / -	10577		10,21,489.00	18,03,011.31

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Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
23/03/2019	23/03/2019	TO TRANSFER-INB BS DEPT LAB EXPENDITURE-CTF5111129 TRANSFER TO 33513087634 HOD- BS, SREC-	CTF5111129 TRANSFER TO 33513087634 HOD- BS, SREC / -	99922	2,428.00		1,11,714.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33681894394-777387	TRANSFER TO 33681894394 / 777387	10577		6,000.00	1,17,714.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 30840553455-863472	TRANSFER TO 30840553455 / 863472	10577		13,020.00	1,30,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634-972042	TRANSFER TO 33513087634 / 972042	10577		44,000.00	1,74,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715-937550	TRANSFER TO 33512370715 / 937550	10577		1,98,000.00	3,72,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513089347-777148	TRANSFER TO 33513089347 / 777148	10577		1,12,000.00	4,84,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975-777252	TRANSFER TO 33604045975 / 777252	10577		2,00,000.00	6,84,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982-54695	TRANSFER TO 33512454982 / 54695	10577		1,88,000.00	8,72,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 10826488552-106268	TRANSFER TO 10826488552 / 106268	10577		10,00,000.00	18,72,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513089347-777149	TRANSFER TO 33513089347 / 777149	10577		88,000.00	19,60,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634-972043	TRANSFER TO 33513087634 / 972043	10577		41,000.00	20,01,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715-100854	TRANSFER TO 33512370715 / 100854	10577		1,98,000.00	21,99,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982-54696	TRANSFER TO 33512454982 / 54696	10577		1,90,000.00	23,89,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975-777253	TRANSFER TO 33604045975 / 777253	10577		1,90,000.00	25,79,734.33
26/03/2019	26/03/2019	BY TRANSFER-INB FUND TRANSFER-CTF5291662 TRANSFER FROM 37296299778 SANTHIRAM ENGINEERING-	CTF5291662 TRANSFER FROM 37296299778 SANTHIRAM ENGINEERING / -	99922		50,000.00	26,29,734.33
26/03/2019	26/03/2019	BY TRANSFER-INB FUND TRANSFER-CTF5292133 TRANSFER FROM 37296630804 SANTHIRAM ENGINEERING-	CTF5292133 TRANSFER FROM 37296630804 SANTHIRAM ENGINEERING / -	99922		50,000.00	26,79,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB ADVANCE TOBUSES-CTF5291624 TRANSFER TO 62289702577 Mr. NAYAB SHAIK ANWAR-	CTF5291624 TRANSFER TO 62289702577 Mr. NAYAB SHAIK ANWAR / -	99922	50,000.00		26,29,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB DIESEL BILL FOR COLLEGE VEHICLES-CTF5307098 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTF5307098 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	1,00,000.00		25,29,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB TRAVELLING EXPENDITURE TO VIJAYAWADA-CTF5306058 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTF5306058 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	5,864.00		25,23,870.33
26/03/2019	26/03/2019	TO TRANSFER-INB IMPREST AMOUNT TO MBA DEPT-CTF5306515 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF5306515 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	1,005.00		25,22,865.33
26/03/2019	26/03/2019	TO TRANSFER-INB IT FOR 2017-18-CTF5306621 TRANSFER TO 31957038662 SANTHIRAM ENGINEERING-	CTF5306621 TRANSFER TO 31957038662 SANTHIRAM ENGINEERING / -	99922	24,00,000.00		1,22,865.33
26/03/2019	26/03/2019	CASH DEPOSIT-CASH DEPOSIT SELF--	- / -	10577		2,300.00	1,25,165.33
27/03/2019	27/03/2019	TO TRANSFER-INB MANAGEMENT MEET BY MBA DEPT-CTF5372974 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF5372974 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	16,670.00		1,08,495.33
27/03/2019	27/03/2019	TO TRANSFER-INB CARPENTRY MATERIAL FOR NEW BLOCK-CTF5372271 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5372271 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	7,140.00		1,01,355.33

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Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
27/03/2019	27/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982-54697	TRANSFER TO 33512454982 / 54697	10577		1,27,000.00	2,28,355.33
27/03/2019	27/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975-777254	TRANSFER TO 33604045975 / 777254	10577		2,20,000.00	4,48,355.33
27/03/2019	27/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715-100855	TRANSFER TO 33512370715 / 100855	10577		1,04,000.00	5,52,355.33
27/03/2019	27/03/2019	TO TRANSFER-INB IT- CTF5447451 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING-	CTF5447451 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING / -	99922	5,00,000.00		52,355.33
27/03/2019	27/03/2019	TO TRANSFER-INB IEEE STUDENT MEMBERSHIPS- CTF5373018 TRANSFER TO 33513089347 HOD, EEE- SREC-	CTF5373018 TRANSFER TO 33513089347 HOD, EEE- SREC / -	99922	15,600.00		36,755.33
30/03/2019	30/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634-972044	TRANSFER TO 33513087634 / 972044	10577		3,00,000.00	3,36,755.33
30/03/2019	30/03/2019	TO TRANSFER-INB NAME PLATE BOARDS OF ALL DEPTS-CTF5372814 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5372814 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	45,500.00		2,91,255.33
30/03/2019	30/03/2019	TO TRANSFER-INB ONE DAY SEMINAR BY ME DEPT- CTF5781805 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5781805 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	1,205.00		2,90,050.33
30/03/2019	30/03/2019	TO TRANSFER-INB TELEPHONE BILL FOR JAN,FEB-19-CTF5781919 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5781919 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	2,020.00		2,88,030.33
13/04/2019	13/04/2019	TO TRANSFER-INB WOOD TO DOORS-CTF7146481 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF7146481 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	1,882.00		2,86,148.33
13/04/2019	13/04/2019	TO TRANSFER-INB TRAVELLING BILL FOR MD SIR-CTF7146750 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF7146750 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	4,400.00		2,81,748.33
13/04/2019	13/04/2019	TO TRANSFER-INB ONE DAY SEMINAR BY MBA DEPT ON 30.03.19-CTF7146035 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF7146035 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	3,760.00		2,77,988.33
13/04/2019	13/04/2019	TO TRANSFER-INB ONE DAY INDUSTRIAL VISIT BY ECE 27.03.19-CTF7146692 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTF7146692 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	9,647.00		2,68,341.33
13/04/2019	13/04/2019	TO TRANSFER-INB DIESEL BILL FOR MARCH-19- CTF7147029 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTF7147029 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	49,175.00		2,19,166.33
13/04/2019	13/04/2019	TO TRANSFER-INB TRAVELLING ALLOWANCE TO PRO HYD-CTF7147112 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTF7147112 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	1,350.00		2,17,816.33
13/04/2019	13/04/2019	TO TRANSFER-INB DIESEL FOR GENERATOR AMD COLLEGE VEHICLE- CTF7147252 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTF7147252 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	28,047.00		1,89,769.33
15/04/2019	15/04/2019	TO TRANSFER-INB NEFT UTR NO: SBIN319105722535- NEFT INB: CNAAQHQM3 TRANSFER TO 3197945044305-MAHAMAD ALI AND SONS	NEFT INB: CNAAQHQM3 TRANSFER TO 3197945044305 / -	99922	12,754.36		1,77,014.97
15/04/2019	15/04/2019	CHEQUE DEPOSIT-- TRANSFER TO 34793733215-632411	TRANSFER TO 34793733215 / 632411	10577		7,50,000.00	9,27,014.97
15/04/2019	15/04/2019	TO DEBIT THROUGH CHEQUE-SBI-9294	- / 9294	10577	7,90,080.00		1,36,934.97
18/04/2019	18/04/2019	TO TRANSFER-INB NEFT UTR NO: SBIN619108738257- NEFT INB: CNAAQJUXN8 TRANSFER TO 3197945044305- MAHALAKSHMI PAINT AGENCIES	NEFT INB: CNAAQJUXN8 TRANSFER TO 3197945044305 / -	99922	59,792.36		77,142.61

Principal
Santhiram Engineering College
NANDYAL



The Institution of Engineers (India)
Technical Department
R&D Grant-in-aid Scheme

PROJECT COMPLETION REPORT

1. Project ID : RDUG2018027
2. Project Title : LabView Based Text Detection And Object Recognition Prototype For The Blind And The Dumb People
3. Name of the Investigator : Sunitha Bellam
 - a. E-mail: suni1998reddy@gmail.com
 - c. Mobile No.: 9701730798
 - b. Contact Address: H.NO:2-27,Hussainapuram,Betamcherla mandal, Kurnool dist.A.P-518598
4. Name of the Institution of which Investigator is attached: Santhiram Engineering College
5. Name and Designation of the Guide / supervisor: Dr.M.V.Subramanyam
 - a. E-mail: principal@srecuandyal.edu.in
 - b. Mobile No.:9866308475
6. Name of the Director / Principal of the Institution: Dr.M.V.Subramanyam
7. Date of Release of R & D Grant: 4/12/2018
8. Date of Commencement of the Project: 21/12/2018
9. Amount of R & D Grant: 9,800/-
10. Date of Receipt of R & D Grant: 21/12/2018
11. How much work is yet to be completed with the reason of delay:
 - a. Percentage of work completed: 100%
 - b. Amount utilized till date: 43,800/-

Continued.....

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Technical Department
R&D Grant-in-aid Scheme

12. How much work is yet to be completed with the reason of delay: Nil

- a. Work yet to be completed with details: Nil
- b. Reason for delay: Nil

13. Probable date of completion of the project: 14/09/2019

14. Amount of matching grant :

- a) Name and address of the organization: SREC,NH-18,Nerawada 'X' roads ,Nandyal ,Kurnool dist.A.P.518501
- b) Date of receipt: 21/12/2018
- c) Amount received: 9,800/-
- d) Amount utilised till date: 9,800/-

15. Name of the organizations providing support to the project:

- a. Name of the organization: Santhiram Engineering College
- b. Nature of support e.g. financial, technical and infrastructural : financial, technical and infrastructural
- c. Support yet to be received: 34,000/-

16. Project Achievements in brief:

We developed a prototype which is useful for blind and dumb people

17. Expected beneficiaries of the project: 1. Object recognition and detection for blind people

2. Temperature and humidity conditions of the surroundings are obtained from the prototype

3. The text data entered in the software by the dumb people is visible to others.

18. Any other information to be furnished regarding progress of project: 1. Next we will go for paper publication in reputed journal.

rights

2. once the prototype is published we will apply for patent

Continued.....

[Signature]
Principal
Santhiram Engineering College
NANDYAL



The Institution of Engineers (India)
Technical Department
R&D Grant-in-aid Scheme

PROJECT ID: RDUG2018027

CERTIFICATE

Certified that:

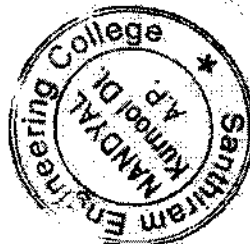
1. The above progress report is correctly and duly audited: YES
2. The necessary infrastructure is available for completion of the project by the due date: YES
3. The balance amount is readily available for completion of the project by the due date: YES
4. Interim technical report on the project has been enclosed: NA
5. The project will be completed by the due date: YES

B. Sunitha

Signature of the Investigator


Signature of the Guide


Signature & Seal of the Director/Principal



Dr. M.V. Subramanyam
B.E., M.Tech., Ph.D., MIEE, FIETE, MISTE, MIE, MCSI
PRINCIPAL
Santhiram Engineering College
NANDYAL-518501, Kurnool (DL) A.P.


Principal

Santhiram Engineering College
NANDYAL



The Institution of Engineers (India)
Technical Department
R&D Grant-in-aid Scheme

UTILISATION CERTIFICATE

(To be submitted in duplicate)

[FOR THE FINANCIAL YEAR - (ENDING 31ST
MARCH)]

1. Project ID : RDUG2018027
2. Title of the Project : LabView Based Text Detection And Object Recognition Prototype For The Blind And The Dumb People
3. Name of the Institution : Santhiram Engineering College
4. Name of the Project Guide (PG) : Dr. M.V. Subramanyam

UTILISATION CERTIFICATE

Certified that out of Rs. 9,800/- of grants-in-aid sanctioned during the year 2018-19 in favour of SREC R&D under IET's letter No. _____ dated 20/12/2018 and Rs. 9,800 A sum of Rs. Nine thousand eight hundred rupees only has been utilised for the purpose of R&D Grant-in-Aid-scheme for which it was sanctioned and that the balance of Rs. _____ remaining unutilised at the end of completion has been returned to IET (vide Cheque/DD No. NA dated NA).

Signature of Principal Guide with
date & seal

Signature of Registrar/
Director /
Principal with date & seal

Signature of
Accounts Officer of the
Institute with date & seal



Dr. M.V. Subramanyam
B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, IAE, MCSI
PRINCIPAL
Santhiram Engineering College
NANDYAL-518501, Kurnool (Dt.) A.P.





The Institution of Engineers (India)
Technical Department
R&D Grant-in-aid Scheme

Objectives (not more than 300 words – in Aerial 9 pt.)

- Most of the people suffer with visual or auditory disabilities either because of weakness or lack of capacity to utilize the sensory organs such as eye and/or ear. These sensory organs basically have control over the remaining parts of the body.
- Object recognition and detection are considered most important help that we can provide through electronic travel aids for the blind since they need a totally independent travel kit that works on the artificial intelligence
- Here the project is focused on the implementation of a hardware and software to recognize an object by using ultrasound technology.
- Another objective of this project is to upgrade the object identification module to notify the temperature and humidity conditions of the location through buzzer.

Achievements (not more than 750 words – in Aerial 9 pt.)

- Here we developed a module which is helpful for the blind and the dumb people.
- With the help of this kit the disability persons can survive by their own and can carry the kit along with them when in need.
- The project kit also gives the information about temperature and humidity report of their surroundings.

Papers published in journals / Papers presented in Seminars / M.Tech Thesis / Ph.D Thesis / Patent generated from this Project NA

Grant received from IET & Year: Rs. 9,800

Year: 2018-19


Principal

Santhiram Engineering College
NANDYAL



The Institution of Engineers (India)
Technical Department
R&D Grant-in-aid Scheme

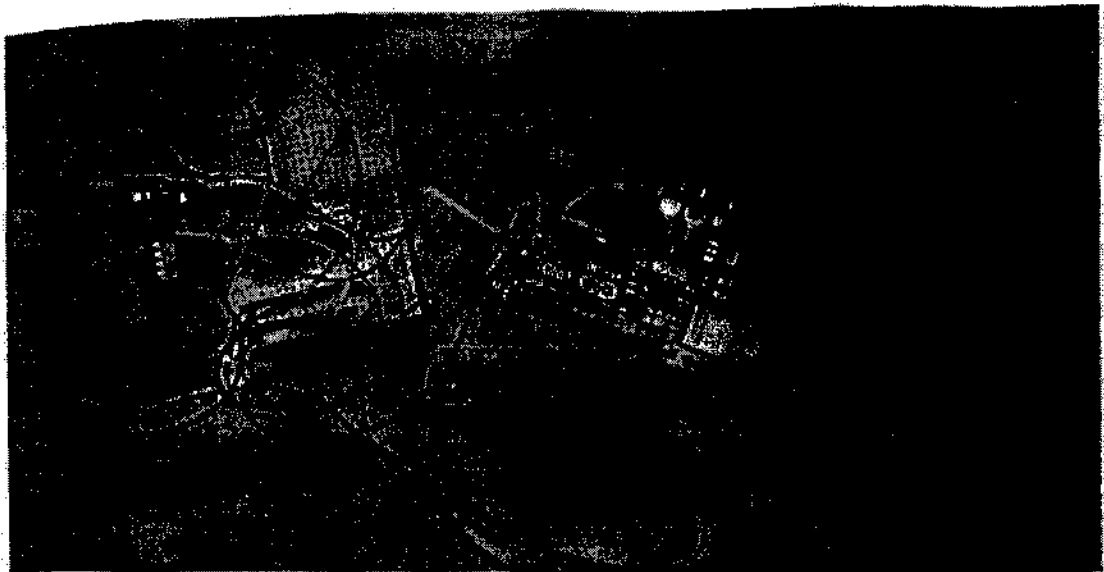
IEI R&D COMPENDIUM PROFORMA

Project title

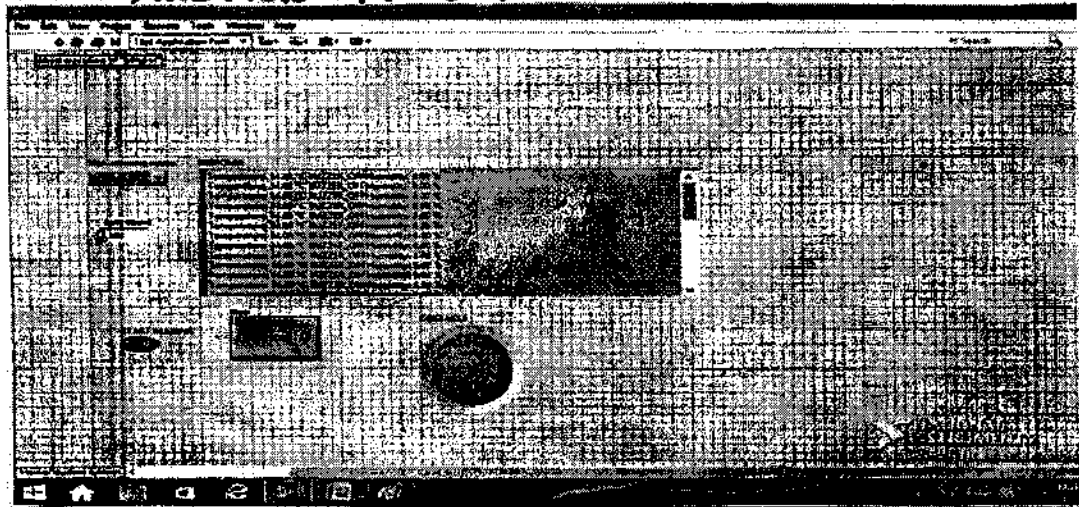
LabView Based Text Detection and Object Recognition Prototype For The Blind And The Dumb People

Student	Guide
Name :B. Sunitha Email: sunil998reddy@gmail.com Mobile: 9701730798 IEI Membership No.: NA	Name: Dr.M.V.Subramanyam Dept.: ECE Email: principal@sreenandya.edu.in Mobile: 9866308475 IEI Membership No.:M131932-3
<u>Institute</u> Name: Santhiram Engineering college Address: NH-18,Nerawada 'X' roads ,Nandyal ,Kurnool dist,A.P,518501 Institutional Membership No.: ---	

Title of the photo: Text Detection And Object Recognition Module



Title of the photo: Object Recognition & Temp Humidity Condition on LabView front Panel





Lab View based Text Detection and Object Recognition Prototype for the Blind and the Dumb People

Student

B.Sunitha, Naga Anitha Regati,
Leelavathi Gopayaram
sunil1998reddy@gmail.com

Guide

Dr.M.V.Subramanyam, *MIE*
G.Sowmya, *MIE*
principal@sreknandyal.edu.in

Institute

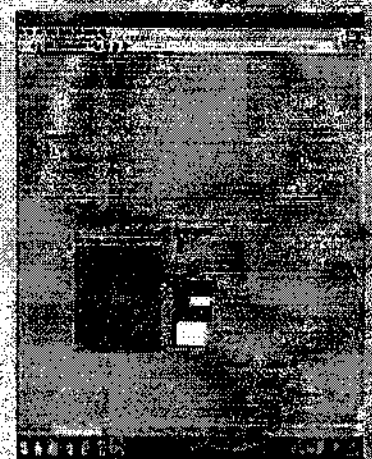
Santhiram Engineering College
NH-18, Nerawada 'X' Roads, Nandyal
Kurnool, Andhra Pradesh
NON-IM



Sensors kit interfaced with
Arduino board



Output in LabVIEW front panel for
DHT and Obstacle detection




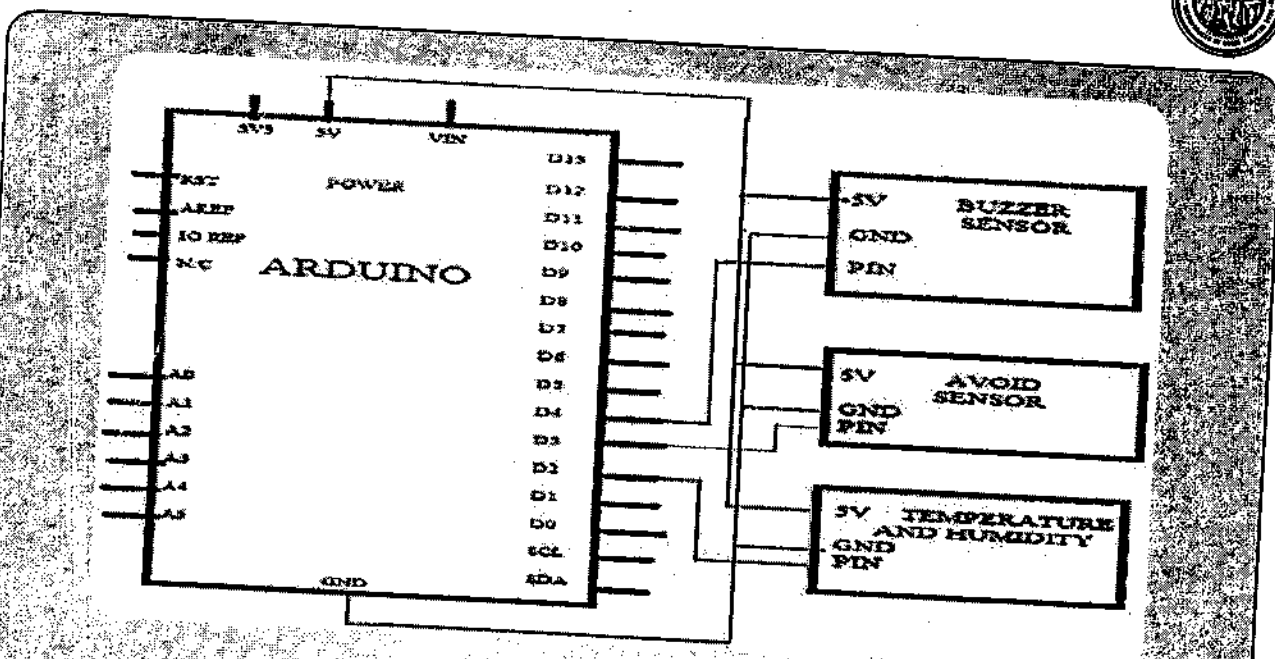
Output in front panel for text to
speech

OBJECTIVES

- Most of the people suffer with visual or auditory disabilities either because of weakness or lack of capacity to utilize the sensory organs such as eye and/or ear. These sensory organs basically have control over the remaining parts of the body. This predicament could be in-born or due to the age factor or sometimes meeting with may result from an accident. Disability affects the life of humans irrespective of its origin and reason. The disables require support from other people in their day to day activities.
- Sound source locator is inherently important for safety, survival and navigation of the physically challenged individuals. In addition to sound source locator the acoustic cues and the visual cues are needed for object detection, tracking and distance measurement etc.
- Object recognition and detection are considered most important help that we can provide through electronic travel aids for the blind since they need a totally independent travel kit that works on artificial intelligence.
- Here the project is focused on the implementation of a hardware and software to recognize an object by using ultrasound technology.
- Another objective of this project is to upgrade the object identification module to notify the temperature and humidity conditions of the location through buzzer.

R&D under IEL Grant-in-aid Scheme


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Prototype Implementation

The project also aims to design a prototype that helps the disables especially the blind and the dumb to walk free as a normal person identifying the objects as well as texts that comes on their way besides notifications of a temperature and humidity conditions of the concerned location.

ACHIEVEMENTS

A module was developed which is helpful for the blind and the dumb people. The design using LabVIEW software and hardware sensors interfaced with Arduino board, achieved designed kit specifications and proved efficient for blind and dumb people with low cost equipment. With the help of this kit the persons with disability can be on their own and can also carry the kit along with them when in need. The project kit also gives the information about temperature and humidity report of their surroundings.

DESCRIPTION

- The developed kit was tested using Arduino Uno board and sensors like obstacle sensor, temperature sensor, buzzer, text converter and Lab VIEW software.
- The blind people could identify an obstacle present in front of them with the help of a buzzer sound.
- The dumb people able to deliver their speech by entering the text in the software which is converted to speech and delivered through the speakers.
- Temperature and humidity could be identified by the device using temperature and humidity sensors.

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R&D under IET Grant-in-aid Scheme




Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : **SANTHIRAM ENGINEERING COLLEGE,NH-18**
NANDYAL,KURNOOL DIST,Kurnool
ALUR
ANDHRA PRADESH-518112
IN

Date : 25 Apr 2019
Account Number : 00000033245622746
Account Description : CA-GEN-PUB-OTH-RURAL-INR
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH
Drawing Power : 0.00
Interest Rate(% p.a.) : 16.7
MOD Balance : 0.00
CIF No. : 86898923696
IFS Code : SBIN0010577
MICR Code : 518002683
Balance as on 1 Jul 2018 : 5,40,387.50

Account Statement from 1 Jul 2018 to 31 Dec 2018

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
24 Aug 2018	24 Aug 2018	CHEQUE WDL-WITHDRAWAL TRANSFER BY CHEQUE-34840	TRANSFER FROM 31859473276 / 34840	10577	50,000.00		4,90,387.50
24 Aug 2018	24 Aug 2018	CHEQUE WDL-WITHDRAWAL TRANSFER BY CHEQUE-34841	TRANSFER FROM 31859473276 / 34841	10577	50,000.00		4,40,387.50
24 Aug 2018	24 Aug 2018	CHEQUE WDL-WITHDRAWAL TRANSFER BY CHEQUE-34842	TRANSFER FROM 31859473276 / 34842	10577	50,000.00		3,90,387.50


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Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
10 Dec 2018	10 Dec 2018	CHQ TRANSFER-NEFT UTR NO: SBIN7183448 87733-34856 ELECTRONI CS SECTOR SKILLS COUNCIL	/ 34856 ELECTRONI CS SECTOR SKILLS COUNCIL	10577	20,005.90		4,65,238.90
18 Dec 2018	18 Dec 2018	BY TRANSFER-PFM C121805741 465 179CSCA 138369--	TRANSFER FROM 31999761052 12 /	10521		28,000.00	4,93,238.90
20 Dec 2018	20 Dec 2018	BY TRANSFER-NEFT*UTIB0 000005*AXT B1835473539 34*IOE*-	TRANSFER FROM 31996790443 02 /	4430		9,800.00	5,03,038.90

**This is a computer generated statement and does not require a signature.


Principal
Santhiram Engineering College
NANDYAL

Visit us : www.sreknandyal.com
Email : principal.srec.x5@gmail.com
srec.nandyal@gmail.com



Ph : 08514 - 276201
Fax : 08514 - 276123

SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/CSE/2018-19/P-27

Date :03/01/2019

To
The Principal
GlobalCET, Satellite City, Kadapa (Dist.,)
Andhra Pradesh, Pin Code: 516162

Dear Sir

Sub: - Payment details for completion of College Maintenance software project -
Reg.

Ref. No. GCET/ CSE/ SW-C01 Date: 11.10.2018

We are very happy with our new research association on customized software development project. Our faculty Mr. S. NAGENDRUDU, Asst Professor, Dept of CSE developed customized research project for College Maintenance software for your Institution.

Now it is requested to concede the instalment towards SREC-Research Project for the recent research services received for the project duration. As it was agreed in the earlier communication, it is appealed to release the project fund of Rs.1,04,000/- (Rs. One Lakh Four Thousands) headed for the research services from SREC.

Thank you

With regards

Principal

Santhiram Engineering College
NANDYAL

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NH - 18, NANDYAL, 518501, Kurnool Dist, A.P.
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Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
27/03/2019	27/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982- 54697	TRANSFER TO 33512454982 / 54697	10577		1,27,000.00	2,28,355.33
27/03/2019	27/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975- 777254	TRANSFER TO 33604045975 / 777254	10577		2,20,000.00	4,48,355.33
27/03/2019	27/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715- 100855	TRANSFER TO 33512370715 / 100855	10577		1,04,000.00	5,52,355.33
27/03/2019	27/03/2019	TO TRANSFER-INB IT- CTF5447451 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING-	CTF5447451 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING / -	99922	5,00,000.00		52,355.33
27/03/2019	27/03/2019	TO TRANSFER-INB IEET STUDENT MEMBERSHIPS- CTF5373018 TRANSFER TO 33513089347 HOD, EEE- SREC-	CTF5373018 TRANSFER TO 33513089347 HOD, EEE- SREC / -	99922	15,600.00		36,755.33
30/03/2019	30/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634- 972044	TRANSFER TO 33513087634 / 972044	10577		3,00,000.00	3,36,755.33
30/03/2019	30/03/2019	TO TRANSFER-INB NAME PLATE BOARDS OF ALL DEPTS-CTF5372814 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5372814 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	45,500.00		2,91,255.33
30/03/2019	30/03/2019	TO TRANSFER-INB ONE DAY SEMINAR BY ME DEPT- CTF5781805 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5781805 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	1,205.00		2,90,050.33
30/03/2019	30/03/2019	TO TRANSFER-INB TELEPHONE BILL FOR JAN,FEB-19-CTF5781919 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5781919 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	2,020.00		2,88,030.33
13/04/2019	13/04/2019	TO TRANSFER-INB WOOD TO DOORS-CTF7146481 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF7146481 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	1,882.00		2,86,148.33
13/04/2019	13/04/2019	TO TRANSFER-INB TRAVELLING BILL FOR MD SIR-CTF7146750 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF7146750 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	4,400.00		2,81,748.33
13/04/2019	13/04/2019	TO TRANSFER-INB ONE DAY SEMINAR BY MBA DEPT ON 30.03.19-CTF7146035 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF7146035 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	3,760.00		2,77,988.33
13/04/2019	13/04/2019	TO TRANSFER-INB ONE DAY INDUSTRIAL VISIT BY ECE 27.03.19-CTF7146692 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTF7146692 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	9,647.00		2,68,341.33
13/04/2019	13/04/2019	TO TRANSFER-INB DIESEL BILL FOR MARCH-19- CTF7147029 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTF7147029 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	49,175.00		2,19,166.33
13/04/2019	13/04/2019	TO TRANSFER-INB TRAVELLING ALLOWANCE TO PRO HYD-CTF7147112 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTF7147112 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	1,350.00		2,17,816.33
13/04/2019	13/04/2019	TO TRANSFER-INB DIESEL FOR GENERATOR AMD COLLEGE VEHICLE- CTF7147252 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTF7147252 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	28,047.00		1,89,769.33
15/04/2019	15/04/2019	TO TRANSFER-INB NEFT UTR NO: SBIN319105722535- NEFT INB: CNAAQHMY3 TRANSFER TO 3197945044305-MAHAMAD ALI AND SONS	NEFT INB: CNAAQHMY3 TRANSFER TO 3197945044305 / -	99922	12,754.36		1,77,014.97
15/04/2019	15/04/2019	CHEQUE DEPOSIT-- TRANSFER TO 34793733215- 632411	TRANSFER TO 34793733215 / 632411	10577		7,50,000.00	9,27,014.97
15/04/2019	15/04/2019	TO DEBIT THROUGH CHEQUE-SBI-9294	- / 9294	10577	7,90,080.00		1,36,934.97
18/04/2019	18/04/2019	TO TRANSFER-INB NEFT UTR NO: SBIN619108738257- NEFT INB: CNAAQJUXN8 TRANSFER TO 3197945044305- MAHALAKSHMI PAINT AGENCIES	NEFT INB: CNAAQJUXN8 TRANSFER TO 3197945044305 / -	99922	59,792.36		77,142.61

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NH-40, Nandyal - 518501, Kurnool Dist. A.P.

R&D and IPR Cell

A.Y. 2017-18

Govt/ NGO - Funded Projects

Sl. No	Name of the Investigator	Dept	Title of the Project	Amount Sanctioned	Name of the Agency	Govt/Non-Govt	Status of the project
1	Mr. P. Bhaksar	CSE	Efficient and Reliable Routing Protocol for Wireless Sensor Networks (WSN'S)	1L	Union Grants Commission (UGC)	Government	Under progress
2	Mr. K. Rajasekhara Reddy Mr. M. Y. Veeresh	EEE	Design & implementation of String Combiner Box	2L	Sprouts Energy Private Limited	Non-Government	Sanctioned



PRINCIPAL
Santhiram Engineering College
Nandyal, Kurnool (A.P.)


CO-ORDINATOR

**“EFFICIENT AND RELIABLE ROUTING PROTOCOL
FOR WIRELESS SENSOR NETWORKS (WSN’S)”**



ज्ञान-विज्ञान विमुक्तये

Final Report of the Minor Research Proposal

Funded by

University Grants Commission with Reference Number
(MRP-6528/16 (SERO/UGC))

By

Mr. P.BHASKAR, M.Tech.

Principal Investigator &
Assistant Professor

Department Of Computer Science & Engineering



SANTHIRAM ENGINEERING COLLEGE

Nandyal – 518501 Kurnool (Dist.), A.P

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An ISO 9001:2008 Certified Institution, 2(f) and 12(B) recognition by UGC Act, 1956.

2017-2019

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www.srecnandyal.com
principal.srec.x5@gmail.com
srec.nandyal@gmail.com



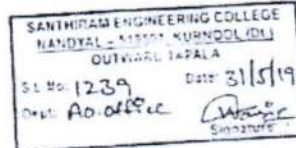
Ph: 08514 - 275001
Fax: 08514 - 275125

SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal
9866308475



SREC/PRO/E- 11/19

Date: 12.05.2019

To

The Joint Secretary,
UGC - SERO, Hyderabad.

Respected Sir,

Sub: P.Bhaskar - PI - SREC- Nandyal A.P - Submission of Hard Copy of the Final Report of the Minor Research Proposal to UGC - Req - Reg.

Ref: UGC approval Letter No. MRP-6528/16 (MRP/UGC-SERO), Dt:26/03/2017

As per the reference cited above, I am here by sending the Final Report on the Minor Research Proposal of the Principal Investigator Mr. P.Bhaskar, topic entitled "Efficient And Reliable Routing Protocol For Wireless Sensor Networks (WSN's)" for which the amount of Rs. 93,000/- (Rupees Ninety Three Thousands only) has been sanctioned and I assure that the amount has been utilized properly only for the proposed research work.

I am here with attaching the following documents for your kind reference.

1. Annexure III, IV, V, VI
2. Annexure - A - Books and Journals
3. Annexure - B - Equipment Details
4. Annexure - C - Field Work and Travel
5. Annexure - D - Contingency
6. Annexure - E - Hiring Services
7. Bills
8. Final Report
9. Publications

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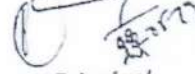
112/1

Total Amount Approved	Amount Sanctioned	Total Amount Incurred	Amount Claimed
Rs. 1,00,000.00	Rs. 93,000.00	Rs. 1,06,552.00	Rs. 13,552.00

Kindly accept and sanction the claimed amount and I will be thankful to you in this regard. I take this opportunity to thank UGC for the financial grant extended to the PI for two years 2017-2019. For further clarifications please contact me over phone 09866308475.

Thanking You Sir,

Yours faithfully



Principal

Santhiram Engineering College
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Santhiram Engineering College
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**UNIVERSITY GRANTS COMMISSION
FORMAT FOR SUBMISSION OF PROPOSAL FOR
MINOR RESEARCH PROJECT**

PART – A

1. Broad Subject : **Computer Science and Engineering**
2. Area of Specialization : **Computer Networks**
3. Duration : **Two years**
4. Principal Investigator :

i. Name : P.Bhaskar
ii. Sex : Male
iii. Date of Birth : 01-06-1984
iv. Category: (GEN/SC/ST/OBC) : SC
v. Qualification : M. Tech
vi. Designation : Assistant Professor
vii. Address: Office : **Santhiram Engineering College**
Department of CSE, Nandyal,
Kurnool(Dist.),AndhraPradesh-518501.

Residence: : H.No:28-812-U1,
N.G.O.s colony,
Nandyal-518502, Kurnool (DT)


Email/Phone : bhaskar5cse@gmail.com
/+91-9908830718

5. Name of the Institution where the project will be undertaken:

- (a) Department : **Computer Science and Engineering**
- (b) College : **Santhiram Engineering College**
- (c) Affiliating University : **JNT University Anantapuramu,
Anantapuramu**
- (d) Whether the institute is located in rural/backward area : **Rural Area**

6. Whether the College is approved under Section 2 (f) and 12 B of the UGC Act?

Yes/No : **YES**


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7. Teaching and Research Experience of Principal Investigator:

(a) Teaching experience : PG 4 Years
(b) Research experience :
(c) Publication : 01

Papers Published : 01

1. Mr. p.Bhaskar, "Highly scalable key pre-distribution scheme for wireless sensor networks " in International Journal of innovative research & development Vol-3, issue-6, June-2014 ISSN number: 2278 – 0211 (online).

Accepted : -Nil-
Communicated : -Nil-
Books Published : -Nil-
Accepted : -Nil-
Communicated : -Nil-

(Please enclose the list of papers and books published and/or accepted during last five years)

PART – B Proposed Research Work

8.

(i) Project Title: Efficient and Reliable Routing Protocol for Wireless Sensor Networks (WSNs)

(ii) Introduction:

Sensor networks are plagued by the problems of interference to wireless communication from environmental noise, node failure and energy-constrained nodes. However, they face mote failures, RF interference from environmental noise and energy constraints. Routing protocols are overcome these problems to achieve reliability, energy efficiency and scalability in message delivery. Achievement of these requirements, however, poses conflicting demands.

(iii) Objectives:

I propose an efficient and reliable routing protocol (EAR) that achieves reliable and scalable performance with minimal compromise of energy efficiency. The routing design of EAR is based on four parameters – expected path length and a weighted combination of distance traversed, energy levels and link transmission success history, dynamically determine and maintain the best route. Simulation experiments of EAR with existing protocols demonstrate that a design based on a combination of routing demonstrate that a design based on a combination of routing parameters exhibits collectively better performance than based on just hop-count and energy of those using flooding.


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(iv) Methodology:

The procedural design of EAR may be divided into three phases: setup, route selection, and data dissemination. These are detailed in the following sections.

A Setup Phase:

When a hub is powered on, it broadcasts an Advertisement (ADV) packet indicating that it wants to receive RPT packets. When a neighboring node around the hub receives this ADV packet, it will store the route to the hub in its routing table. Nodes do not propagate the ADV packet received. A node may store more than one route to the hub. A route in the routing table is indexed using the next hop node's ID – that is the ID of the neighboring node. A node keeps only one route entry for a neighbor that has route to the hub even though that neighbor could have multiple routes to the hub.

B Route Selection Phase:

Ideally, the best route is the shortest as it incurs the lowest latency and consumes the least energy. In an actual environment, the performance of an RF link varies with physical distance and terrain between nodes and should be accounted for in routing decisions. In EAR, shortest routes are initially admitted into the routing table based on hop-count. As RPT packets flow through these links, less desirable ones will start to exhibit high packet loss rate and are eventually blacklisted and omitted from the routing table. Links that are omitted from the routing table may be re-admitted again only after a period of time. Some RF links are affected by temporary external disruption and should be given the chance to be re-admitted. This allow for adaptiveness. The mechanism uses a sliding window that keeps track of the last N attempts, and then it will be blacklisted and omitted from the table.

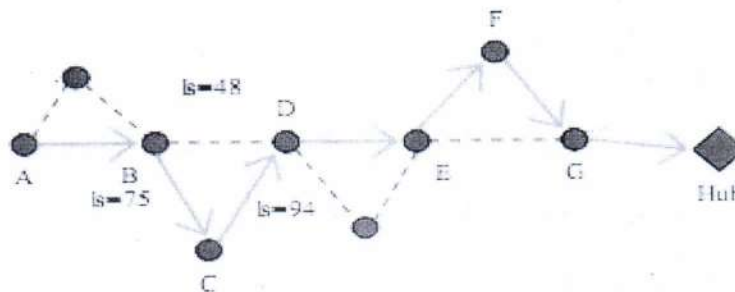


Fig: Illustration of forwarding based on *Link Score* Metric

A metric, $Link\ Score = (P_E * W_E + P_T * W_T)$, where P_E – energy level of the next of the hop node (0.0 to 100.0), W_E – assigned weight for P_E (0.0 to 1.0), P_T – transmission success rate (0.0 to 1.0). Weights, W_E and W_T , may be determined empirically but their sum must equal. Link Score is used when there are two links of different routes with the same hub distance competing to be admitted to the routine table. This is illustrated in Fig. When there is more than one entry with the same Link Score, the entry with the longest length is chosen to be replaced. If there is a tie in route length, then the route with the higher Link Score is admitted.

Data Dissemination:

Sensor nodes generate RPT packets at periodic intervals or sleep, waiting for some event to happen. An RPT packet contains information of interest to network users and has two fields in its header: *ExpPathLen* and *NumHopTraversed*. The first field is the expected number of hops the packets will have to traverse before it reaches the hub. It is defined as $ExpPathLen = NH \times a$, where $0.0 < a < 1.0$, *NH* is the number of hops from this node to the hub for the route selected. The route selected need not be the shortest but *ExpPathLen* is bounded by the network diameter, a mini number of hops to reach the hub is at least 1.

Route Update:

Sensor nodes continually update “best” routes in the routing table. Instead of explicit control packets. EAR uses the handshaking mechanism at the MAC layer. Route information is piggybacked onto both RTS and CTS packets. Fig illustrates this scenario. Hence utilizing RTS and CTS handshaking instead of separate DATA-ACK would result in more current route information for a node.

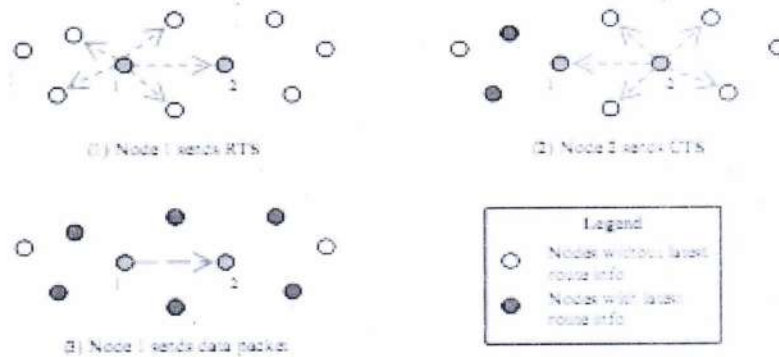


Fig: Piggy Backing on RTS/CTS packet

(v) Year-wise Plan of work and targets to be achieved.

S.No	Name of the Module	Duration
1	Literature Survey	3 Months
2	Modeling & Designing of Base Station Module	4 Months
3	Modeling & Designing of Mobile Terminal Module	4 Months
4	Simulation Results Analysis	3 Months
5	Implementation & Practical Results from the Field Work	6 Months
6	Preparation of Documentation	4 Months
	Total Duration	24 Months


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 Santhiram Engineering College
 MANDYAL

9. Financial Assistance required

Item	Estimated Expenditure
i. Books and Journals	Rs. 50,000-00
ii. Equipment Cost	Rs. 2,65,000-00
iii. Field Work and Travel	Rs. 80,000-00
iv. Stationary	Rs. 20,000-00
v. Contingency (including special needs)	Rs. 55,000-00
vi. Hiring Services	Rs. 30,000-00
Total	Rs. 5,00,000-00

10. Whether the teacher has received support for the research project from the UGC under Major, Minor or from any other agency?

If so, please indicate :

-Nil-

- Name of the agency from which the assistance was approved
- Sanction letter No. and date under which the assistance was approved
- Amount approved and utilized
- Title of the project for which assistance was approved
- In case the project was completed, whether the work on the project has been published
- If the candidate was working for the doctoral degree, whether the thesis was submitted and accepted by the University for the award of degree. (A summary of the report/thesis in about 1,000 words may please be attached with the application)
- If the project has not been completed, please state the reasons

11. (a) Details of the UGC project/scheme completed or ongoing.:

-Nil-


12. Any other information which the teacher may like to give in support of this Proposal:

-No-

To certify that:

- The College is approved under Section 2(f) and 12(B) of the UGC Act and is fit to receive grants from the UGC.
- General physical facilities, such as furniture/space etc., are available in the Department/College.
- I shall abide by the rules governing the scheme in case assistance is provided to me from the UGC for the above project.
- I shall complete the project within the stipulated period. If I fail to do so and if the UGC is not satisfied with the progress of the research project, the Commission may terminate the project immediately and ask for the refund of the entire amount (with interest) released by the UGC.
- The above research Project is not funded by any other agency.

Signature of Principal Investigator


Principal
Santhiram Engineering College
NANDYAL

Principal


(seal)
Principal
Santhiram Engineering College
NANDYAL



Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : SANTHIRAM ENGINEERING COLLEGE, NH-18 NANDYAL, KURN
OOL DIST, Kurnool
ALUR
ANDHRA PRADESH-518112
IN
Date : 14 Nov 2017
Account Number : 00000033245622746
Account Description : CA-GEN-PUB-OTH-RURAL-INR
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH
Drawing Power : 0.00
Interest Rate(% p.a.) : 16.7
MOD Balance : 0.00
CIF No. : 86898923696
IFS Code : SBIN0010577
MICR Code : 518002683
Nomination Registered : No
Balance as on 1 Jan 2017 : 9,743.00

Account Statement from 1 Jan 2017 to 30 Jun 2017

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
12 Mar 2017	12 Mar 2017	A/C Keeping Chgs --		99999	632.50		9,110.50
25 Mar 2017	25 Mar 2017	BY TRANSFER- INB Deposit / Investment-	IHD6153618 TRANSFER FROM 31825422233	99922		6,500.00	15,610.50
3 Apr 2017	3 Apr 2017	BY TRANSFER- NEFT*IDIB000B0 27*IDIBH1709332 5812*PRINCIPAL CHAITA-	TRANSFER FROM 3199421044306	4430		20,000.00	35,610.50
7 Apr 2017	7 Apr 2017	BY TRANSFER- NEFT*CNRB0000 606*P1704074206 5048*UNIVERSIT Y GRANTS-	TRANSFER FROM 3199414044305	4430		65,000.00	1,00,610.50
17 Jun 2017	17 Jun 2017	CHEQUE DEPOSIT-- 792086	TRANSFER TO 33086784412 / 792086	10577		1,97,455.00	2,98,065.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680854 91-34829 UGC SERO HYDERABAD	34829 UGC SERO HYDERABAD	10577	57,868.00		2,40,197.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680871 30-34824 UGC SERO HYDERABAD	34824 UGC SERO HYDERABAD	10577	31,142.00		2,09,055.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680887 14-34822 UGC SERO HYDERABAD	34822 UGC SERO HYDERABAD	10577	43,341.00		1,65,714.50

PRINCIPAL
Santhiram Engineering College
Nandyal, Kurnool(Dt.), A.P.

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
10 Dec 2018	10 Dec 2018	CHQ TRANSFER-NEFT UTR NO: SBIN7183448 87733-34856 ELECTRONICS SECTOR SKILLS COUNCIL	/ 34856 ELECTRONICS SECTOR SKILLS COUNCIL	10577	20,005.90		4,65,238.90
18 Dec 2018	18 Dec 2018	BY TRANSFER-PFM C121805741 465 179CSCA 138369--	TRANSFER FROM 31999761052 12 /	10521		28,000.00	4,93,238.90
20 Dec 2018	20 Dec 2018	BY TRANSFER-NEFT*UTIB0 000005*AXT B1835473539 34*IOE*-	TRANSFER FROM 31996790443 02 /	4430		9,800.00	5,03,038.90

**This is a computer generated statement and does not require a signature.



Principal
Santhiram Engineering College
NANDYAL



Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : SANTHIRAM ENGINEERING COLLEGE, NH-18
NANDYAL, KURNOOL DIST, Kurnool
ALUR
ANDHRA PRADESH-518112
IN

Date : 18 Jan 2020
Account Number : 00000033245622746
Account Description : CA-GEN-PUB-OTH-RURAL-INR
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH
Drawing Power : 0.00
Interest Rate(% p.a.) : 16.7
MOD Balance : 0.00
CIF No. : 86898923696
IFS Code : SBIN0010577
MICR Code : 518002683
Balance as on 1 Jul 2019 : 17,92,952.50

Account Statement from 1 Jul 2019 to 31 Dec 2019

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
16 Aug 2019	16 Aug 2019	BY TRANSFER-PFM C081904005 934 274987-C081904005 875 179CSCA-	TRANSFER FROM 45994371052 12 /	10521		4,681.00	17,97,633.50
2 Sep 2019	2 Sep 2019	BY TRANSFER-NEFT*BARB 0TRICOI*BARBR1924512 3682*STEPS KNOWLEDGE-	TRANSFER FROM 31994140443 05 /	4430		1,00,000.00	18,97,633.50
24 Sep 2019	24 Sep 2019	BULK POSTING-BY SALARY-	/	50203		1,89,720.00	20,87,353.50
1 Oct 2019	1 Oct 2019	CHEQUE WDL- TRF CHQ-34867	TRANSFER FROM 62423775910 ELECTRONICS AND ICT AC / 34867	20149	1,00,000.00		19,87,353.50


Principal
Santhiram Engineering College
NANDYAL

ACKNOWLEDGEMENT FOR THE GRANTS RECEIVED FROM UGC-SERO, HYDERABAD

(TO BE RETURNED IMMEDIATELY ON RECEIPT OF (PFMS E-PAYMENT))

GEN/SC/ST

B- 29/2018-19

4

TO,
The Joint Secretary,
University Grants Commission -SERO,
4th Floor, A.P.S.F.C Building,
Chirag Ali Lane,Hyderabad -500001.

Received from University Grants Commission - South Eastern Regional office,
Hyderabad a grant of Rs. 28,000 (Rupees Twenty Eight
thousands only only)

by PFMS E-Payment Credited to our college A/c.No. 33245622746 on
MRP 6528/16 in terms of Sanction No.F. MRP 6528/16 /dt. Dec 12

Under the scheme Minor research project (GEN/SC/ST)

Date: 26/12/18
Station: Nandyal

Affix
Revenue stamp

Signature of the Principal

Full Name: Dr. M.V. Subramanyam
Office Seal: Dr. M.V. Subramanyam
B.E. M.Tech, Ph.D, MIEEE, FIETE, MISTE, MIE, MCSI
Santhiram Engineering College
NANDYAL-518501, Kurnool (Dt.) A.P.

(NOTE: FUTURE GRANTS TO THE COLLEGES WILL DEPEND ON RECEIPT OF THIS
ACKNOWLEDGEMENT WITHIN A WEEK ON RECEIPT OF THE GRANT)

Principal
Santhiram Engineering College
NANDYAL

paid
on
1521
2018

**ACKNOWLEDGEMENT FOR THE GRANTS RECEIVED FROM UGC-SERO, HYDERABAD
(TO BE RETURNED IMMEDIATELY ON RECEIPT OF (PFMS E-PAYMENT))**

GEN/SC/ST

2018-20
B-20/2018-19
4

To,
The Joint Secretary,
University Grants Commission -SERO,
4th Floor, A.P.S.F.C Building,
Chirag Ali Lane, Hyderabad -500001.

Received from University Grants Commission - South Eastern Regional office,
Hyderabad a grant of Rs. 4,681/- (Rupees Four Thousand
Six hundred and Eighty one only)
by PFMS E-Payment Credited to our college A/c.No. 3324582746 on
16-08-19 in terms of Sanction No.F. M.P.P-6528/16 /dt.
Under the scheme (GEN/SC/ST)

Date: 30-08-19
Station: NANDYAL



Affix
Revenue stamp

Signature of the Principal
Subramanyam
Office Seal
PRINCIPAL
Santhiram Engineering College
Nandyal, Kurnool (Dt.) A.P.

(NOTE: FUTURE GRANTS TO THE COLLEGE WILL DEPEND ON RECEIPT OF THIS
ACKNOWLEDGEMENT WITHIN A WEEK ON RECEIPT OF THE GRANT)

Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/EEE/2017-18/P-15

Date: 07.06.2018

To
Sprouts Energy Private Limited,
Mittakandala Village,
Kurnool (Dist.),
Andhra Pradesh.

Dear Sir,

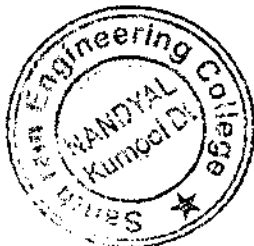
Sub: - SREC-Information about Research Activity- Design & Implementation of String Combiner Box- Reg.

Ref. No. SEPL/May/2018/12/03 - Date: 12-05-2018

As per your ref cited above, we are happy to inform that the Dept. of EEE wish to take up your project titled "**Design & Implementation of String Combiner Box**". The duration required for the implementation of boxes is 6 months and the cost per each unit is Rs.40, 000/-. We are looking forward for the project order.

Total project cost - Design & Implementation of String Combiner Box (5 units) is Rs.2,00,000/- (Two Lakh Rupees only inclusive of all taxes).

Thanking you,



(Handwritten signature)
Principal

With regards

(Handwritten signature)
Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/EEE/2017-18/P-19

Date: 28.06.2018

To
The Head of the Department,
Electrical and Electronics Engineering,
Santhiram Engineering College,
Nandyal.

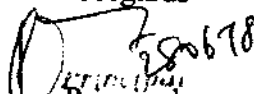
Dear Sir,

Sub:-Information about Research Project 'Design & Implementation of String Combiner Box'- Reg.

It is bringing to your notice that, the SREC has accepted & willing to do the research activity with Sprouts Energy Private Limited for the Project Titled "Design & Implementation of String Combiner Box". As per our discussion, based on the expertise, assign this research project to the Mr.K. Rajasekhara Reddy, Assistant Professor and Mr. M.Y.Veeresh, Assistant Professor, Dept.of EEE. The project duration is 6 months. You are informed to complete this project before the due date and also informed to demonstrate it.

Thanking you,



With regards

Principal,
Santhiram Engineering College
NANDYAL

Approved by AICTE, New Delhi - Permanently Affiliated to JNTUA, Anantapuramu
NH - 18, NANDYAL - 518501, Kurnool Dist, A.P.

An ISO 9001:2008 Certified College (2018 & 12(B) College) Affiliated to UGC Act, 1956

Santhiram Engineering College
NANDYAL

Visit us: www.srecnandyal.edu.in
Email : hod.eec@srecnandyal.edu.in

Phone: 08514-276201
Cell No: 9705765566



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NH-40, Nandyal-518501:: Kurnool Dist . A. P.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Lr. No: SREC/EEE/R&D/2018-19/P-04

Date: 12.01.2019

To
The Principal,
Santhiram Engineering College,
Nandyal.

Dear Sir,

Sub: SREC-EEE-Report related to completion of the research project-Reg.

We have successfully completed the research project entitled "Design & Implementation of String Combiner Box" with the help of Mr.K. Rajasekhara Reddy, Assistant Professor and Mr. M. Y. Veeresh, Assistant Professor, Dept of EEE in 6 months.

The model according to Sprouts Energy Private Limited specifications is enclosed.

Thank you Sir,

With regard

grees

HEEE

Enclosed: Project Report and Kit.

V. V.
Principal
Santhiram Engineering College
NANDYAL



SANTHIRAM ENGINEERING COLLEGE : NANDYAL

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NH-40, Nandyal-518501:: Kurnool Dist . A. P.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Report on

Design and Implementation of String Combiner Box

Introduction:

In Photovoltaic based solar power plant system, the modules are arranged in strings depending upon the total power, inverter used and technical characteristics of the module. The string combiner box (SBC) accommodates over-current protection devices, disconnectors and surge protection devices. The string combiner boxes form subsystems that can be designed according to number of strings, voltage and current ratings.

Benefits:

- Solar string combiners improve safety of solar panels and the entire photovoltaic plant.
- Solar combiner box, also called DC switchboard, fuse disconnectors with fuse links, surge protective devices and switch disconnectors.
- Combiner box solutions for all residential, commercial and utility-scale applications with single string.
- Solar string combiners are built body are having great mechanical strength.
- Protection against dust, heavy seas or powerful jets of water, chemicals and high UV rays.

Design and Specification:

The Sprouts Energy Private Limited solar power plant is having a capacity of 2MW. A single solar panel is of 310W capacity with open circuit voltage of 40V and a current rating of 8.2A. A 20 number of such solar panel are connected in series to form as a string of power capacity of $310W \times 20 = 6.2KW$ with voltage of 800V and current of 8.2A. One such 24 strings are connected in parallel to form as a block of power capacity of $6.2KW \times 24 = 148.8KW$ with a voltage rating of 800V and a current rating of 196.8A.

A string combiner box is designed based on the above rating required. In this design, a total of 24 positive output pins and 24 negative output pins are coming out from a 24 string block. The 24 positive pins are reduced to 12 positive pins through a T or Y or branch connectors before the string combiner box. Similarly, the 24 negative pins to 12 negative pins are taken out from Y connectors.



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 NH-40, Nandyal-518501:: Kurnool Dist . A. P.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Therefore, from the above inputs, a string combiner box is designed for a 1000V, 200A, 12 port positive and negative input pins. The requirement of string combiner boxes of 5 in quantity are identical in design and specifications. The specifications used in each of the SBC are as follows.

S. No.	Item Description	Make	Part no.	Qty.
1	FRP material Enclosure Box 548 (H) x 650 (W) x 250 (D) mm approx. with IP65, IK 10 rating.	Allied enclosure USA	AM24208IRLS	1
2	Bakelite material Mounting Base plate 460 (H) x 560 (W) x 5 (D) mm.	Reputed Make	-	1
3	DC disconnecter Switch (1000V, DC 400A, 2P).	Socomec / ABB / Telergon	26PV2039	1
4	PV Fuses (1000V, 30A) with fuse holder (1000V, 30/32A).	Mersen / Little Fuse / elmex	HP10M30 / USM1HEL	12 set
5	Surge Protection (SPD, type 2), 1000V, DC	Dehn	950535	1
6	Earth terminal Block.	Elmex / Connectwell	ET 16/CGT16U	1
7	Pressure Equalizer / Ventilation device (M12).	Ortac / reputed make	OMVPBL01UHL	4
8	Box side female MC4 Connectors 1000V DC rated.		32.0078P0001-UR	12
9	Box side Male MC4 Connectors 1000V DC rated.		32.0079P0001-UR	12
10	Field side Female MC4 Connectors 1000V DC rated.		32.0016P0001-UR	12
11	Field side Male Connectors 1000V DC rated.		32.0017P0001-UR	12
12	Polyamide cable gland (IP 68), M20	Ortac / reputed make	OMRB04	1
13	Polyamide cable gland (IP 68), M40, (clamping range- \varnothing 22- \varnothing 32mm).	Ortac / reputed make	OMRB08	2
14	+ve copper tinned bus bar (250x40x5mm). +/- 5mm.		-	1
15	-ve copper tinned bus bar (155x40x5mm). +/- 5mm.		-	1
16	Spreader links copper tinned (75x40x5mm). +/- 5mm.		-	2
17	Copper flexible cable for string input 6sqmm	Apar / reuted	-	1 set



SANTHIRAM ENGINEERING COLLEGE : NANDYAL

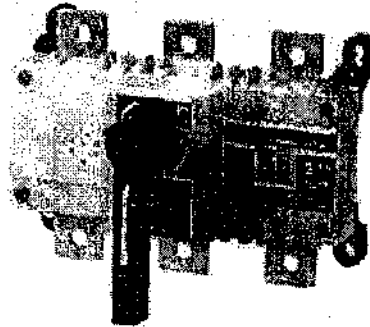
Approved by AICTE, New Delhi: Permanently Affiliated to JNTUA, Ananthapuramu
An ISO 9001:2015 Certified Institution, 2(f) & 12(B) recognition by UGC Act, 1956
NH-40, Nandyal-518501:: Kurnool Dist . A. P.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

		make		
18	16sqmm SPD Cables	Apar/reute d make	-	1 set
19	Internal wiring diagram (SLD).	-	-	1
20	Enclsoure mounitng channel with Box side hardware.	Allied enclosure USA	-	4 set
21	Acrylic sheet for live part protection.	Reputed Make	-	1 set
22	Output hardware M12x40 with Nut, Plain washer & spring washer.	Reputed Make	-	2 set
23	Other Accessories (Insulater, sticker, Din Rail, Lugs, etc.)	Reputed Make	-	1 set

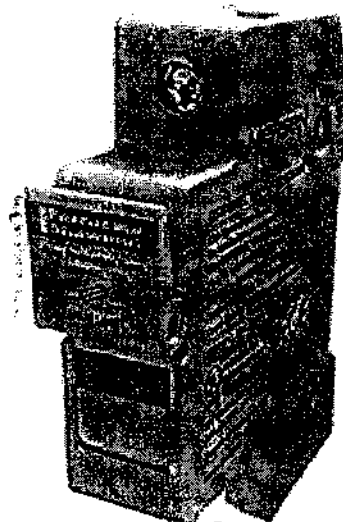
Some of the Main Component of SBC:

DC Disconnecter Switch:



A 2 pole, 400 Ampere rated current and 1000V DC Voltage Disconnecter switch is employed in the SBC.

PV Fuse Holder:



[Signature]
Principal

Santhiram Engineering College

A 30 Ampere, 1000 Volts Solar PV Fuse Holder is used in the SBC.

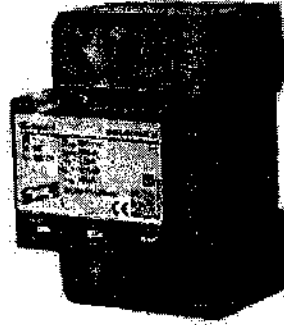


SANTHIRAM ENGINEERING COLLEGE : NANDYAL

Approved by AICTE, New Delhi: Permanently Affiliated to JNTUA, Ananthapuramu
An ISO 9001:2015 Certified Institution, 2(f) & 12(B) recognition by UGC Act, 1956
NH-40, Nandyal-518501:: Kurnool Dist . A. P.

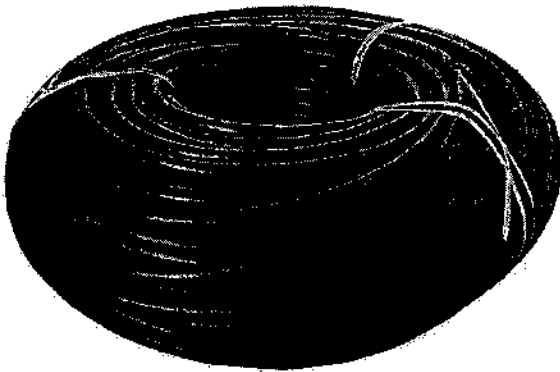
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Surge Protection:

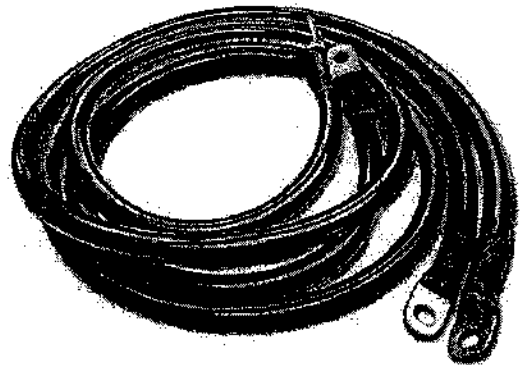


A type 2, Surge protection device of 1000V is employed in the SBC.

Cables:



A 6sq.mm Copper flexible cable used in SBC.



A 16sq.mm Surge Protection for string input Cable used in SBC.



SANTHIRAM ENGINEERING COLLEGE : NANDYAL

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NH-40, Nandyal-518501:: Kurnool Dist . A. P.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Photo 1: The complete make model of string combiner box.

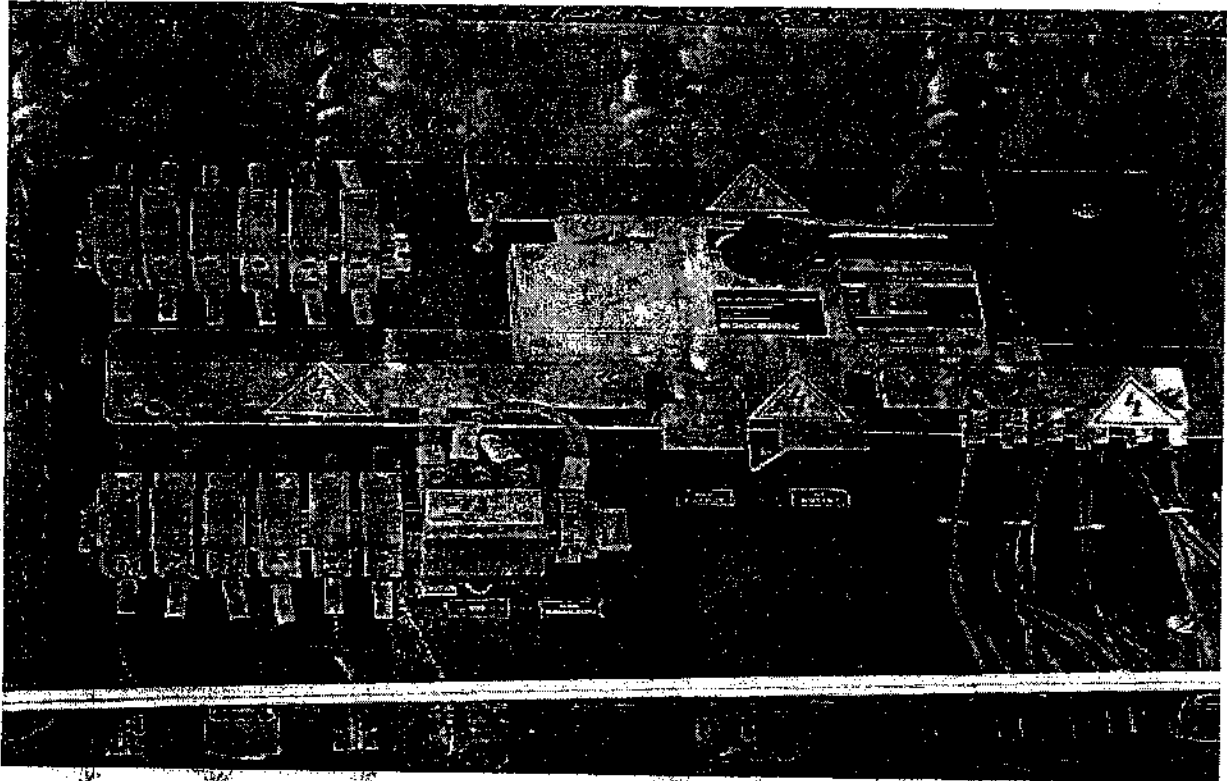
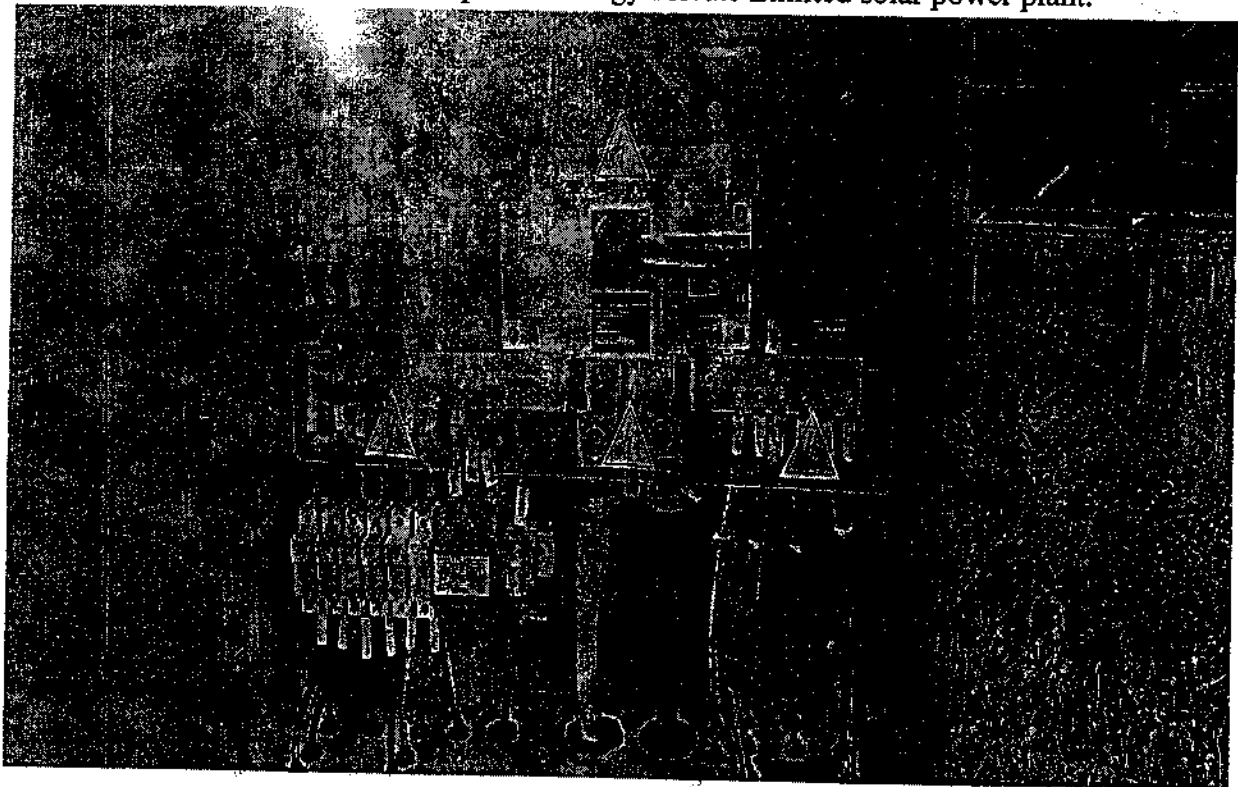


Photo 2: The SBC is built in the Sprouts Energy Private Limited solar power plant.



Note: The single line diagram of wiring connections of string combiner box are arranged as per the diagram shown in figure 1.

Principal
Santhiram Engineering College



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 NH-40, Nandyal-518501:: Kurnool Dist . A. P.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Wiring Diagram:

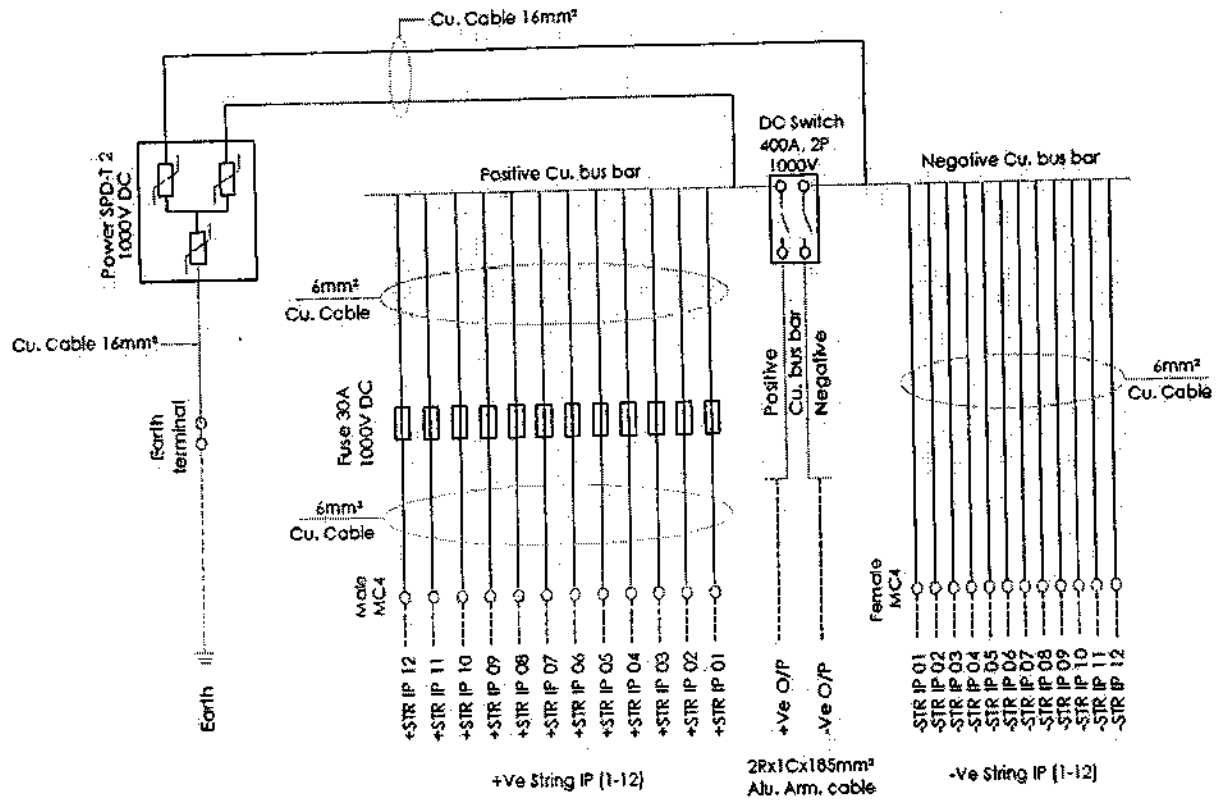


Figure 1: Single Line Diagram of Wiring of String Combiner Box



SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, MIE

Principal

Cell : 9866308475

Lr. No: SREC/PRO/R&D/EEE/2018-19/P-02

Date: 17/01/2019

To
Sprouts Energy Private Limited,
Mittakandala Village,
Kurnool (Dist.),
Andhra Pradesh.

Dear Sir,

Sub: Submission of Research Project Kits and request to release the due for the Research Activity-Reg.

Ref. No.: SEPL/June/2018/25/02 - Date: 25-06-2018

I wish to confirm you that the research project kits "String Combiner Box-05 units" are given to your client. Please sanction the amount of Rs.2,00,000/- (Two Lakh Rupees Only) at the earliest.

Thanking you,

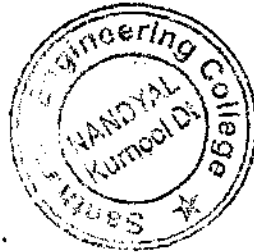
With regards


Principal

Santhiram Engineering College
NANDYAL

Enclosures:

Project Report and kits.





Sprouts Energy Pvt. Ltd.

Lr. No. SEPL/March/2019/28/03

Date: 28-03-2019

To

The Principal,

Santhiram Engineering College,

Nandyal, Kurnool, A.P.

Dear Sir,

Sub: Payment of Research Project "Design and Implementation of String Combiner Box" - reg

Ref. No: SREC/PRO/R&D/EEE/2018-19/P-02, Dt: 17.01.2019.

----XXX----


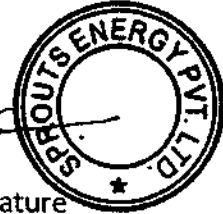
I wish to inform you that the modules are working properly, and your team is continuously monitoring and supporting. I am happy to inform you that the total amount of the project of Rs.2,00,000/- (Two Lakh Rupees only) was paid as per the details given below.

S.No.	Date	Cheque Number	Amount
1.	25-03-2019	777148	Rs. 1,12,000/-
2.	26-03-2019	777149	Rs. 88,000/-
Total			Rs. 2,00,000/-

I request you to support us in future for any requirements and to verify the accounts.

Thanking you

From Sprouts Energy Private Limited

Authorized Signature

#401, Indra Imperia, Above Yes Bank, Ramanthapur, Hyderabad – 500

013, Ph: 8309154730

Principal

Santhiram Engineering College
NANDYAL



Date : 20 Jan 2020
Account Number : 00000030353702437
Description : CA-GEN-PUB-IND-RURAL-INR
Name : SANTHIRAM ENGINEERING COLLEGE
Currency : INR
Corporate Address : NERAWADA
NANDYAL
AP-518113
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH(10577)
Rate of Interest (% p.a.) : 16.7%
IFS Code : SBIN0010577
Book Balance : 132732.36
Available Balance : 132732.36
Hold Value : 0.00
MOD Balance : 0.00
Uncleared Amount : 0.00
Balance as on 1 Jan 2019 : 1,57,467.31


Account Statement from 1 Jan 2019 to 30 Jun 2019

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
02/01/2019	02/01/2019	TO TRANSFER-INB FILTER SHEET TO AO OFFICE TOPPERS LIST-CTE7951365 TRANSFER TO 31802094635 Mr. MATTAM NARESH-	CTE7951365 TRANSFER TO 31802094635 Mr. MATTAM NARESH / -	99922	2,000.00		1,55,467.31
02/01/2019	02/01/2019	TO TRANSFER-INB MATHS DAY CELEBRATIONS -2018- CTE7951426 TRANSFER TO 33513087634 HOD- BS, SREC-	CTE7951426 TRANSFER TO 33513087634 HOD- BS, SREC / -	99922	59,272.00		96,195.31
02/01/2019	02/01/2019	TO TRANSFER-INB DIESEL BILL FOR COLLEGE VEHICLES AND GEN- CTE7950884 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTE7950884 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	42,584.00		53,611.31
05/01/2019	05/01/2019	TO TRANSFER-INB ECE DEPT IMPREST EXPENDITURE-CTE8247331 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247331 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	1,800.00		51,811.31
05/01/2019	05/01/2019	TO TRANSFER-INB helix ultra5w40-4l-CTE8246856 TRANSFER TO 33512454982 HOD, ME- SREC-	CTE8246856 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	4,200.00		47,611.31
05/01/2019	05/01/2019	TO TRANSFER-INB TRAVELLING EXPENDITURE TO HECE AND HCSE- CTE8247180 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247180 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	3,770.00		43,841.31
05/01/2019	05/01/2019	TO TRANSFER-INB MINI PROJECT KIT TO ECE- CTE8247063 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTE8247063 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	36,000.00		7,841.31
05/01/2019	05/01/2019	BY TRANSFER-CLOSERE- TRANSFER FROM 37701060164 SANTHIRAM ENGINEERING-	TRANSFER FROM 37701060164 SANTHIRAM ENGINEERING / -	10577		7,73,681.00	7,81,522.31
05/01/2019	05/01/2019	BY TRANSFER-CLOSERE- TRANSFER FROM 37829919826 SANTHIRAM ENGINEERING-	TRANSFER FROM 37829919826 SANTHIRAM ENGINEERING / -	10577		10,21,489.00	18,03,011.31

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Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
23/03/2019	23/03/2019	TO TRANSFER-INB BS DEPT LAB EXPENDITURE-CTF5111129 TRANSFER TO 33513087634 HOD- BS, SREC-	CTF5111129 TRANSFER TO 33513087634 HOD- BS, SREC / -	99922	2,428.00		1,11,714.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33681894394-777387	TRANSFER TO 33681894394 / 777387	10577		6,000.00	1,17,714.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 30840553455-863472	TRANSFER TO 30840553455 / 863472	10577		13,020.00	1,30,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634-972042	TRANSFER TO 33513087634 / 972042	10577		44,000.00	1,74,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715-937550	TRANSFER TO 33512370715 / 937550	10577		1,98,000.00	3,72,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513089347-777148	TRANSFER TO 33513089347 / 777148	10577		1,12,000.00	4,84,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975-777252	TRANSFER TO 33604045975 / 777252	10577		2,00,000.00	6,84,734.33
25/03/2019	25/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982-54695	TRANSFER TO 33512454982 / 54695	10577		1,88,000.00	8,72,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 10826488552-106268	TRANSFER TO 10826488552 / 106268	10577		10,00,000.00	18,72,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513089347-777149	TRANSFER TO 33513089347 / 777149	10577		88,000.00	19,60,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33513087634-972043	TRANSFER TO 33513087634 / 972043	10577		41,000.00	20,01,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512370715-100854	TRANSFER TO 33512370715 / 100854	10577		1,98,000.00	21,99,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33512454982-54696	TRANSFER TO 33512454982 / 54696	10577		1,90,000.00	23,89,734.33
26/03/2019	26/03/2019	CHEQUE DEPOSIT-- TRANSFER TO 33604045975-777253	TRANSFER TO 33604045975 / 777253	10577		1,90,000.00	25,79,734.33
26/03/2019	26/03/2019	BY TRANSFER-INB FUND TRANSFER-CTF5291662 TRANSFER FROM 37296299778 SANTHIRAM ENGINEERING-	CTF5291662 TRANSFER FROM 37296299778 SANTHIRAM ENGINEERING / -	99922		50,000.00	26,29,734.33
26/03/2019	26/03/2019	BY TRANSFER-INB FUND TRANSFER-CTF5292133 TRANSFER FROM 37296630804 SANTHIRAM ENGINEERING-	CTF5292133 TRANSFER FROM 37296630804 SANTHIRAM ENGINEERING / -	99922		50,000.00	26,79,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB ADVANCE TOBUSES-CTF5291624 TRANSFER TO 62289702577 Mr. NAYAB SHAIK ANWAR-	CTF5291624 TRANSFER TO 62289702577 Mr. NAYAB SHAIK ANWAR / -	99922	50,000.00		26,29,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB DIESEL BILL FOR COLLEGE VEHICLES-CTF5307098 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT-	CTF5307098 TRANSFER TO 33703061868 SANTHIRAM FILLING STAT / -	99922	1,00,000.00		25,29,734.33
26/03/2019	26/03/2019	TO TRANSFER-INB TRAVELLING EXPENDITURE TO VIJAYAWADA-CTF5306058 TRANSFER TO 33604045975 HOD-ECE, SREC-	CTF5306058 TRANSFER TO 33604045975 HOD-ECE, SREC / -	99922	5,864.00		25,23,870.33
26/03/2019	26/03/2019	TO TRANSFER-INB IMPREST AMOUNT TO MBA DEPT-CTF5306515 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF5306515 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	1,005.00		25,22,865.33
26/03/2019	26/03/2019	TO TRANSFER-INB IT FOR 2017-18-CTF5306621 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING-	CTF5306621 TRANSFER TO 31957038662 SANTHI RAM ENGINEERING / -	99922	24,00,000.00		1,22,865.33
26/03/2019	23/03/2019	CASH DEPOSIT-CASH DEPOSIT SELF--	- / -	10577		2,300.00	1,25,165.33
27/03/2019	27/03/2019	TO TRANSFER-INB MANAGEMENT MEET BY MBA DEPT-CTF5372974 TRANSFER TO 33512457280 HOD, MBA - SREC-	CTF5372974 TRANSFER TO 33512457280 HOD, MBA - SREC / -	99922	16,670.00		1,08,495.33
27/03/2019	27/03/2019	TO TRANSFER-INB CARPENTRY MATERIAL FOR NEW BLOCK-CTF5372271 TRANSFER TO 33512454982 HOD, ME- SREC-	CTF5372271 TRANSFER TO 33512454982 HOD, ME- SREC / -	99922	7,140.00		1,01,355.33


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SANSHIRAM ENGINEERING COLLEGE:: NANDYAL

NIH-40, Nandyal – 518501 : Kurmool Dist. A.P.

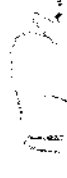
R&D and IPR Cell

A.Y. 2016-17

Govt/ NGO – Funded Projects

SL.No	Name of the Investigator	Dept	Title of the Project	Amount Sanctioned	Name of the Agency	Govt/Non-Govt	Status of the project
1	Mr.P.Bhaksar	CSE	Efficient and Reliable Routing Protocol for Wireless Sensor Networks (WSN'S)	IL	Union Grants Commission (UGC)	Government	Sanctioned and Rs. 0.65Lac is released on 07-04-2017


~~COORDINATOR~~



PRINCIPAL
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Nandyal, Kurmool(Dt.), A.P.

**“EFFICIENT AND RELIABLE ROUTING PROTOCOL
FOR WIRELESS SENSOR NETWORKS (WSN'S)”**



ज्ञान-विज्ञान विमुक्तये

Final Report of the Minor Research Proposal

Funded by

University Grants Commission with Reference Number
(MRP-6528/16 (SERO/UGC))

By

Mr. P.BHASKAR, M.Tech..

Principal Investigator &

Assistant Professor

Department Of Computer Science & Engineering



SANTHIRAM ENGINEERING COLLEGE

Nandyal – 518501 Kurnool (Dist.), A.P

Approved by AICTE, New Delhi; Affiliated to JNTUA, Anantapuramu.

As ISO 9001:2008 Certified Institution. 2(f) and 12(B) recognition by UGC Act, 1956.

2017-2019

Principal

**Santhiram Engineering College
NANDYAL**

www.srechandyal.com
principal.srec.x5@gmail.com
srec.nandyal@gmail.com



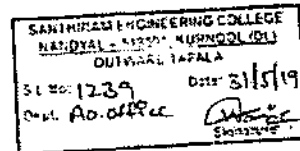
Ph: 08514 - 278220
Fax: 08514 - 278120

SANTHIRAM ENGINEERING COLLEGE

Dr. M.V. SUBRAMANYAM

B.E., M.Tech., Ph.D., MIEEE, FIETE, MISTE, FAIE

Principal
9866308475



SREC/PRO/E- 11/19

Date: 12.05.2019

To:

The Joint Secretary,
UGC - SERO, Hyderabad.

Respected Sir,

Sub: P.Bhaskar - PI - SREC- Nandyal A.P - Submission of Hard Copy of the Final Report of the Minor Research Proposal to UGC - Req - Reg.

Ref: UGC approval Letter No. MRP-6528/16 (MRP/UGC-SERO) Dt: 26/03/2017

As per the reference cited above, I am here by sending the Final Report on the Minor Research Proposal of the Principal Investigator Mr. P.Bhaskar, topic entitled "Efficient And Reliable Routing Protocol For Wireless Sensor Networks (WSN's)" for which the amount of Rs. 93,000/- (Rupees Ninety Three Thousands only) has been sanctioned and I assure that the amount has been utilized properly only for the proposed research work.

I am here with attaching the following documents for your kind reference.

1. Annexure III, IV, V, VI
2. Annexure - A - Books and Journals
3. Annexure - B - Equipment Details
4. Annexure - C - Field Work and Travel
5. Annexure - D - Contingency
6. Annexure - E - Hiring Services
7. BCL
8. Final Report
9. Publications

Approved by AICTE, New Delhi - Permanently Affiliated to JNTUA, Anantapur -
NH - 18 NANDYAL - 518501 - Kurnool Dist. A.P.
An ISO 9001:2008 Certified College. 27(a) & 12(B) Recognition by UGC Act 1956

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1/2/19

Total Amount Approved	Amount Sanctioned	Total Amount Incurred	Amount Claimed
Rs. 1,00,000.00	Rs. 93,000.00	Rs. 1,06,552.00	Rs. 13,552.00

Kindly accept and sanction the claimed amount and I will be thankful to you in the regard. I take this opportunity to thank UGC for the financial grant extended to the PI for two years 2017-2019. For further clarifications please contact me over phone 09866508475.

Thanking You Sir,

Yours faithfully,



Principal

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NANDYAL

**UNIVERSITY GRANTS COMMISSION
FORMAT FOR SUBMISSION OF PROPOSAL FOR
MINOR RESEARCH PROJECT**

PART – A

1. Broad Subject : **Computer Science and Engineering**
2. Area of Specialization : **Computer Networks**
3. Duration : **Two years**

4. Principal Investigator :

- i. Name : P.Bhaskar
ii. Sex : Male
iii. Date of Birth : 01-06-1984
iv. Category: (GEN/SC/ST/OBC) : SC
v. Qualification : M. Tech
vi. Designation : Assistant Professor
vii. Address: Office : **Santhiram Engineering College**
Department of CSE, Nandyal,
Kurnool(Dist.),AndhraPradesh-518501.

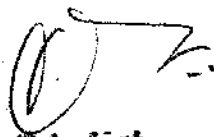
Residence: : H.No:28-812-U1,
N.G.O.s colony,
Nandyal-518502, Kurnool (DT)

Email/Phone : bhaskar5cse@gmail.com
/+91-9908830718

5. Name of the Institution where the project will be undertaken:

- (a) Department : **Computer Science and Engineering**
(b) College : **Santhiram Engineering College**
(c) Affiliating University : **JNT University Anantapuramu,
Anantapuramu**
- (d) Whether the institute is located in rural/backward area : **Rural Area**

6. Whether the College is approved under Section 2 (f) and 12 B of the UGC Act?
Yes/No : **YES**


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7. Teaching and Research Experience of Principal Investigator:

(a) Teaching experience : PG 4 Years
(b) Research experience :
(c) Publication : 01

Papers Published : 01

1. Mr. p.Bhaskar, "Highly scalable key pre-distribution scheme for wireless sensor networks " in International Journal of innovative research & development Vol-3, issue-6, June-2014 ISSN number: 2278 - 0211 (online).

Accepted : -Nil-
Communicated : -Nil-
Books Published : -Nil-
Accepted : -Nil-
Communicated : -Nil-

(Please enclose the list of papers and books published and/or accepted during last five years)

PART – B Proposed Research Work

8.


- (i) **Project Title: Efficient and Reliable Routing Protocol for Wireless Sensor Networks (WSNs)**

(ii) Introduction:

Sensor networks are plagued by the problems of interference to wireless communication from environmental noise, node failure and energy-constrained nodes. However, they face mote failures, RF interference from environmental noise and energy constraints. Routing protocols are overcome these problems to achieve reliability, energy efficiency and scalability in message delivery. Achievement of these requirements, however, poses conflicting demands.

(iii) Objectives:

I propose an efficient and reliable routing protocol (EAR) that achieves reliable and scalable performance with minimal compromise of energy efficiency. The routing design of EAR is based on four parameters – expected path length and a weighted combination of distance traversed, energy levels and link transmission success history, dynamically determine and maintain the best route. Simulation experiments of EAR with existing protocols demonstrate that a design based on a combination of routing demonstrate that a design based on a combination of routing parameters exhibits collectively better performance than based on just hop-count and energy of those using flooding.


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(iv) Methodology:

The procedural design of EAR may be divided into three phases: setup, route selection, and data dissemination. These are detailed in the following sections.

A Setup Phase:

When a hub is powered on, it broadcasts an Advertisement (ADV) packet indicating that it wants to receive RPT packets. When a neighboring node around the hub receives this ADV packet, it will store the route to the hub in its routing table. Nodes do not propagate the ADV packet received. A node may store more than one route to the hub. A route in the routing table is indexed using the next hop node's ID – that is the ID of the neighboring node. A node keeps only one route entry for a neighbor that has route to the hub even though that neighbor could have multiple routes to the hub.

B Route Selection Phase:

Ideally, the best route is the shortest as it incurs the lowest latency and consumes the least energy. In an actual environment, the performance of an RF link varies with physical distance and terrain between nodes and should be accounted for in routing decisions. In EAR, shortest routes are initially admitted into the routing table based on hop-count. As RPT packets flow through these links, less desirable ones will start to exhibit high packet loss rate and are eventually blacklisted and omitted from the routing table. Links that are omitted from the routing table may be re-admitted again only after a period of time. Some RF links are affected by temporary external disruption and should be given the chance to be re-admitted. This allow for adaptiveness. The mechanism uses a sliding window that keeps track of the last N attempts, and then it will be blacklisted and omitted from the table.

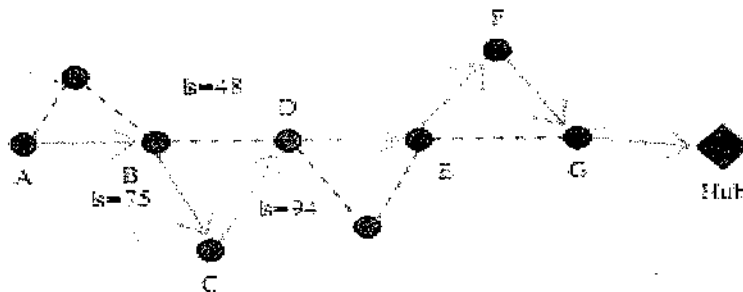


Fig: Illustration of forwarding based on *Link Score* Metric

A metric, $Link\ Score = (P_E * W_E + P_T * W_T)$, where P_E – energy level of the next of the hop node (0.0 to 100.0), W_E – assigned weight for P_E (0.0 to 1.0), P_T – transmission success rate (0.0 to 1.0). Weights, W_E and W_T , may be determined empirically but their sum must equal. Link Score is used when there are two links of different routes with the same hub distance competing to be admitted to the routine table. This is illustrated in Fig. When there is more than one entry with the same Link Score, the entry with the longest length is chosen to be replaced. If there is a tie in route length, then the route with the higher Link Score is admitted.


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Data Dissemination:

Sensor nodes generate RPT packets at periodic intervals or sleep, waiting for some event to happen. An RPT packet contains information of interest to network users and has two fields in its header: *ExpPathLen* and *NumHopTraversed*. The first field is the expected number of hops the packets will have to traverse before it reaches the hub. It is defined as $ExpPathLen = NH \times a$, where $0.0 < a < 1.0$, *NH* is the number of hops from this node to the hub for the route selected. The route selected need not be the shortest but *ExpPathLen* is bounded by the network diameter, a mini number of hops to reach the hub is at least 1.

Route Update:

Sensor nodes continually update "best" routes in the routing table. Instead of explicit control packets, EAR uses the handshaking mechanism at the MAC layer. Route information is piggybacked onto both RTS and CTS packets. Fig illustrates this scenario. Hence utilizing RTS and CTS handshaking instead of separate DATA-ACK would result in more current route information for a node.

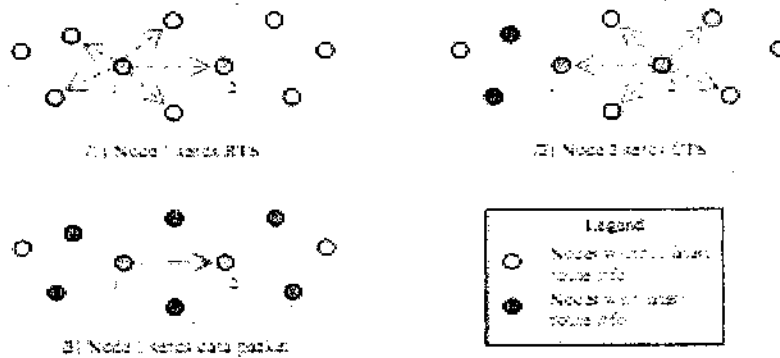


Fig: Piggy Backing on RTS/CTS packet

(v) Year-wise Plan of work and targets to be achieved.

S.No	Name of the Module	Duration
1	Literature Survey	3 Months
2	Modeling & Designing of Base Station Module	4 Months
3	Modeling & Designing of Mobile Terminal Module	4 Months
4	Simulation Results Analysis	3 Months
5	Implementation & Practical Results from the Field Work	6 Months
6	Preparation of Documentation	4 Months
	Total Duration	24 Months

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9. Financial Assistance required

Item	Estimated Expenditure
i. Books and Journals	Rs. 50,000-00
ii. Equipment Cost	Rs. 2,65,000-00
iii. Field Work and Travel	Rs. 80,000-00
iv. Stationary	Rs. 20,000-00
v. Contingency (including special needs)	Rs. 55,000-00
vi. Hiring Services	Rs. 30,000-00
Total	Rs. 5,00,000-00

10. Whether the teacher has received support for the research project from the UGC under Major, Minor or from any other agency?

If so, please indicate : **-Nil-**

- Name of the agency from which the assistance was approved
- Sanction letter No. and date under which the assistance was approved
- Amount approved and utilized
- Title of the project for which assistance was approved
- In case the project was completed, whether the work on the project has been published
- If the candidate was working for the doctoral degree, whether the thesis was submitted and accepted by the University for the award of degree. (A summary of the report/thesis in about 1,000 words may please be attached with the application)
- If the project has not been completed, please state the reasons

11. (a) Details of the UGC project/scheme completed or ongoing.: **-Nil-**

12. Any other information which the teacher may like to give in support of this Proposal: **-No-**

To certify that:

- The College is approved under Section 2(f) and 12(B) of the UGC Act and is fit to receive grants from the UGC.
- General physical facilities, such as furniture/space etc., are available in the Department/College.
- I shall abide by the rules governing the scheme in case assistance is provided to me from the UGC for the above project.
- I shall complete the project within the stipulated period. If I fail to do so and if the UGC is not satisfied with the progress of the research project, the Commission may terminate the project immediately and ask for the refund of the entire amount (with interest) released by the UGC.
- The above research Project is not funded by any other agency.

Signature of Principal Investigator

Principal

Santhiram Engineering College
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Principal
Santhiram Engineering College
NANDYAL



Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : SANTHIRAM ENGINEERING COLLEGE, NH-18 NANDYAL, KURN
OOL DIST, Kurnool
ALUR
ANDHRA PRADESH-518112
IN
Date : 14 Nov 2017
Account Number : 00000033245622746
Account Description : CA-GEN-PUB-OTH-RURAL-INR
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH
Drawing Power : 0.00
Interest Rate(% p.a.) : 16.7
MOD Balance : 0.00
CIF No. : 86898923696
IFS Code : SBIN0010577
MICR Code : 518002683
Nomination Registered : No
Balance as on 1 Jan 2017 : 9,743.00

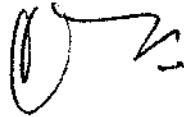
Account Statement from 1 Jan 2017 to 30 Jun 2017

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12 Mar 2017	12 Mar 2017	A/C Keeping Chgs -		99999	632.50		9,110.50
25 Mar 2017	25 Mar 2017	BY TRANSFER- INB Deposit / Investment-	IHD6153618 TRANSFER FROM 31825422233	99922		6,500.00	15,610.50
3 Apr 2017	3 Apr 2017	BY TRANSFER- NEFT*IDIB000B0 27*IDIBH1709332 5812*PRINCIPAL CHAITA-	TRANSFER FROM 3199421044306	4430		20,000.00	35,610.50
7 Apr 2017	7 Apr 2017	BY TRANSFER- NEFT*CNRB0000 606*P1704074206 5048*UNIVERSIT Y GRANTS-	TRANSFER FROM 3199414044305	4430		65,000.00	1,00,610.50
17 Jun 2017	17 Jun 2017	CHEQUE DEPOSIT-- 792086	TRANSFER TO 33086784412 / 792086	10577		1,97,455.00	2,98,065.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680854 91-34829 UGC SERO HYDERABAD	34829 UGC SERO HYDERABAD	10577	57,868.00		2,40,197.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680871 30-34824 UGC SERO HYDERABAD	34824 UGC SERO HYDERABAD	10577	31,142.00		2,09,055.50
17 Jun 2017	17 Jun 2017	CHQ TRANSFER- NEFT UTR NO: SBIN3171680887 14-34822 UGC SERO HYDERABAD	34822 UGC SERO HYDERABAD	10577	43,341.00		1,65,714.50

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Nandyal, Kurnool (Dt.) A.P.

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
10 Dec 2018	10 Dec 2018	CHQ TRANSFER-NEFT UTR NO: SBIN7183448 87733-34856 ELECTRONI CS SECTOR SKILLS COUNCIL	/ 34856 ELECTRONI CS SECTOR SKILLS COUNCIL	10577	20,005.90		4,65,238.90
18 Dec 2018	18 Dec 2018	BY TRANSFER-PFM C121805741 465 179CSCA 138369-	TRANSFER FROM 31999761052 12 /	10521		28,000.00	4,93,238.90
20 Dec 2018	20 Dec 2018	BY TRANSFER-NEFT*UTIB0 000005*AXT B1835473539 34*IOE*-	TRANSFER FROM 31996790443 02 /	4430		9,800.00	5,03,038.90

**This is a computer generated statement and does not require a signature.



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Account Name : SREC R & D SND GRANTS OPERATED BY PRINCIPAL
Address : SANTHIRAM ENGINEERING COLLEGE,NH-18
NANDYAL,KURNOOL DIST,Kurnool
ALUR
ANDHRA PRADESH-518112
IN

Date : 18 Jan 2020
Account Number : 00000033245622746
Account Description : CA-GEN-PUB-OTH-RURAL-INR
Branch : RAJIV GANDHI COLLEGE OF ENGG AND TECH
Drawing Power : 0.00
Interest Rate(% p.a.) : 16.7
MOD Balance : 0.00
CIF No. : 86898923696
IFS Code : SBIN0010577
MICR Code : 518002683
Balance as on 1 Jul 2019 : 17,92,952.50

Account Statement from 1 Jul 2019 to 31 Dec 2019

Txn Date	Value Date	Description	Ref No./Cheque No.	Branch Code	Debit	Credit	Balance
16 Aug 2019	16 Aug 2019	BY TRANSFER-PFM C081904005 934 274987-C081904005 875 179CSCA-	TRANSFER FROM 45994371052 12 /	10521		4,681.00	17,97,633.50
2 Sep 2019	2 Sep 2019	BY TRANSFER-NEFT*BARB 0TRICOI*BARBR1924512 3682*STEPS KNOWLEDG E-	TRANSFER FROM 31994140443 05 /	4430		1,00,000.00	18,97,633.50
24 Sep 2019	24 Sep 2019	BULK POSTING-BY SALARY-	/	50203		1,89,720.00	20,87,353.50
1 Oct 2019	1 Oct 2019	CHEQUE WDL- TRF CHQ-34867	TRANSFER FROM 62423775910 ELECTRONICS AND ICT AC / 34867	20149	1,00,000.00		19,87,353.50


Principal
Santhiram Engineering College

ACKNOWLEDGEMENT FOR THE GRANTS RECEIVED FROM UGC-SERO, HYDERABAD

(TO BE RETURNED IMMEDIATELY ON RECEIPT OF PFMS E-PAYMENT)

GEN/SC/ST

2-2-2018-19

TO,
The Joint Secretary,
University Grants Commission -SERO,
4th Floor, A.P.S.F.C Building,
Chirag Ali Lane, Hyderabad -500001.

4

Received from University Grants Commission - South Eastern Regional office,
Hyderabad a grant of Rs. 28,000/- (Rupees Twenty Eight
thousand only only)

by PFMS E-Payment Credited to our college A/c.No. 3394582746 on
in terms of Sanction No.F. MRP-528/16 /dt. Dec 12

Under the scheme Minor research project (GEN/SC/ST)

Date: 26/12/18
Station: Nandyal

Affix
Revenue stamp

Signature of the Principal

Full Name: D. M. V. Subramanyam
Office Seal: BE, M.Tech, Ph.D., MIEEE, FIETE, MISTE, MIE, MCSI
Santhiram Engineering College
NANDYAL-518501, Kurnool (Dt.) A.P.

(NOTE: FUTURE GRANTS TO THE COLLEGES WILL DEPEND ON RECEIPT OF THIS
ACKNOWLEDGEMENT WITHIN A WEEK ON RECEIPT OF THE GRANT)

[Signature]
Principal
Santhiram Engineering College
NANDYAL

ACKNOWLEDGEMENT FOR THE GRANTS RECEIVED FROM UGC-SERO, HYDERABAD
(TO BE RETURNED IMMEDIATELY ON RECEIPT OF PEMS E-PAYMENT)

GEN/SC/ST

12/06/2019

To,
The Joint Secretary,
University Grants Commission - SERO,
4th Floor, A.P.S.F.C Building,
Chirag Ali Lane Hyderabad - 500001

Received from University Grants Commission - South Central Regional Office,
Hyderabad a grant of Rs. 4,68,211 (Rupees Four Lakhs Sixty Eight Thousand One Hundred and Eleven only)

by PEMS E-Payment Credited to our college A/c No. 22266102200000000000 on
14/06/2019 in terms of Sanction No. F. 111/2-65/2019 /dt.
Under the scheme (GEN/SC/ST)

Date: 30/06/2019
Station: NANDYAL



Amr
Revenue stamp

Signature of the Principal
K. D. N. S. Subramanian
Office Seal PRINCIPAL

(NOTE: FUTURE GRANTS TO THE COLLEGE WILL DEPEND ON REGULAR AND TIMELY
ACKNOWLEDGEMENT WITHIN A WEEK ON RECEIPT OF THE GRANT SUPPLY D.V.)

Principal
Santhiram Engineering College
NANDYAL