



Controller General of Patents, Designs and Trademarks
Department of Industrial Policy and Promotion
Ministry of Commerce and Industry

Application Details

APPLICATION NUMBER	202041032691
APPLICATION TYPE	ORDINARY APPLICATION
DATE OF FILING	30/07/2020
APPLICANT NAME	1 . DR. J. CHRISTOPHER CLEMENT 2 . DR. K. C. SRIHARIPRIYA 3 . DR. ELIZABETH RUFUS 4 . DR. G. JEGAN
TITLE OF INVENTION	CONSUMER-ID BISECTED COMPOUND BAND ACCESS METHOD FOR A SMART GRID SYSTEM
FIELD OF INVENTION	COMMUNICATION
E-MAIL (As Per Record)	
ADDITIONAL-EMAIL (As Per Record)	christopher.clement@vit.ac.in
E-MAIL (UPDATED Online)	
PRIORITY DATE	
REQUEST FOR EXAMINATION DATE	--
PUBLICATION DATE (U/S 11A)	07/08/2020

Application Status

[View Documents](#)

ET: 9119560572

FORM 1 THE PATENTS ACT 1970 (39 OF 1970) & The Patents Rules, 2003 APPLICATION FOR GRANT OF PATENT (See section 7, 54 & 135 and rule 20(1))				For Office Use Only	
				D/66179 P.V. 30/07/20	
		Application No		20204032691	
		Filing Date		30/07/2020	
		Amount of fee paid		1750/-	
		CBR No		24713	
		Signature		P.V. 30/07/20	
1. APPLICANT'S REFERENCE / IDENTIFICATION NUMBER (As Allotted by Office)					
2. TYPE OF APPLICATION (Please tick the appropriate category)				700312297	
Ordinary (☒)		Convention ()		PCT-NP ()	
Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition ()	Divisional ()	Patent of Addition ()
3A. APPLICANT					
Name in full		Nationality	Country of Residence	Address of the Applicant	
DR. J. CHRISTOPHER CLEMENT		Indian	India	Position	Associate Professor
				Department	School of Electronics Engineering
				Institute	Vellore Institute of Technology
				City	Vellore
				State	TamilNadu
				Country	India
				Pin code	632007
DR. K. C. SRIHARIPRIYA		Indian	India	Position	Associate Professor
				Department	School of Electronics Engineering
				Institute	Vellore Institute of Technology
				City	Vellore
				State	TamilNadu
				Country	India
				Pin code	632007

PATENT OFFICE CHENNAI 31/07/20

30-Jul-2020/66179/202041032691/Form 1

DR. ELIZABETH RUFUS	Indian	India	Position	Professor
			Department	School of Electronics Engineering
			Institute	Vellore Institute of Technology
			City	Vellore
			State	TamilNadu
			Country	India
			Pin code	632007
DR. JOHN RAJAN A	Indian	India	Position	Professor
			Department	Department of Manufacturing Engineering, School of Mechanical Engineering,
			Institute	Vellore Institute of Technology
			City	Vellore
			State	TamilNadu
			Country	India
			Pin code	632007
DR. G.JEGAN	Indian	India	Position	Assistant Professor
			Department	Department of Electronics Engineering
			Institute	Sathyabama Institute of Science and Technology
			City	Chennai
			State	TamilNadu
			Country	India
			Pin code	600119

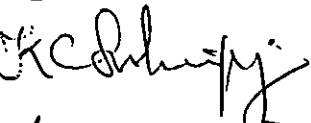
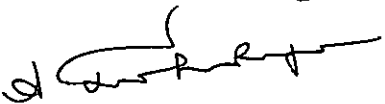
3B. CATEGORY OF APPLICANT [Please tick at the appropriate category]

Natural Person	Other than Natural Person		
	Small Entity ()	Start-up ()	Others ()

3. INVENTOR [Please tick at the appropriate category]

Are all the Inventor (s) same as the applicant(s) named above?	Yes (☒)	No ()
If "No", furnish the details of Inventor (s)		

Name in full	Nationality	Country of Residence	Address of the Applicant		
			Position		
			Department		
			Institute		
			City		
			State		
			Country		
			Pin code		
5. TITLE OF THE INVENTION					
Consumer-ID Bisected Compound Band Access Method for a Smart Grid System					
6. AUTHORISED REGISTERED PATENT AGENT (S)		IN / PA No.			
		Name			
		Mobile Number			
7. ADDRESS FOR SERVICE OF APPLICANT IN INDIA		Name		DR. J. CHRISTOPHER CLEMENT	
		Postal Address		Associate Professor School of Electronics Engineering, Vellore Institute of Technology Vellore Tamil Nadu India Pincode: 632007	
		Telephone Number			
		Mobile Number		9789340886	
		Fax Number		-	
		E-mail ID		christopher.clement@vit.ac.in	
8. IN CASE OF APPLICATION CLAIMING PRIORITY OF APPLICATION FILED IN CONVENTION COUNTRY, PARTICULARS OF CONVENTION APPLICATION					
Country	Application Number	Filing date	Name of the applicant	Title of the invention	IPC (as classified in convention country)
--	--	--	--	--	--
9. IN CASE OF PCT NATIONAL PHASE APPLICATION, PARTICULARS OF INTERNATIONAL APPLICATION FILED UNDER PATENT CO-OPERATION TREATY (PCT)					

International Application Number	International Filing date
--	--
10. IN CASE OF DIVISIONAL APPLICATION FILED UNDER SECTION 16, PARTICULARS OF ORIGINAL (FIRST) APPLICATION	
Original (first) application number	Date of filing of original (first) application
--	--
11. IN CASE OF PATENT OF ADDITION FILED UNDER SECTION 54, PARTICULARS OF MAIN APPLICATION OR PATENT	
Main application / patent no.	Date of filing of main application
--	--
12. DECLARATIONS	
i. Declaration by the inventor(s): (In case the applicant is an assignee: the inventor(s) may sign herein below or the applicant may upload the assignment or enclose the assignment with this application for patent or send the assignment by post / electronic transmission duly authenticated within the prescribed period). I, the above named inventor is the true & first inventor for this invention and declare that the applicant herein is our assignee or legal representative (a) Date : 27/07/2020 Signature : 1.  2.  3.  4.  5.  Name : 1. DR. J. CHRISTOPHER CLEMENT 2. DR. K. C. SRIHARIPRIYA 3. DR. ELIZABETH RUFUS 4. DR. JOHN RAJAN A 5. DR. G. JEGAN	
6. Declaration by the applicant (s) in the convention country: (In case the applicant in India is different than the applicant in the convention country: the applicant in the convention country may sign herein below or applicant in India may upload the assignment from the applicant in the convention country or enclose the said assignment with this application for patent	

or send the assignment by post / electronic transmission duly authenticated within the prescribed period).

We, the applicant in the convention country declare that the applicant herein is my assignee or legal representative.

(a) Date : 27/7/2020

(b) Signature

1. 
2. 
3. 
4. 
5. 

Name of the signatory : 1. DR. J. CHRISTOPHER CLEMENT

2. DR. K. C. SRIHARIPRIYA

4. DR. ELIZABETH RUFUS

5. DR. JOHN RAJAN A

6. DR. G. JEGAN

7. Declaration by the applicant (s):

We are the applicant hereby declare that:

- ☒ We are in possession of the above mentioned invention.
- ☒ The ~~provisional~~ / complete specification relating to the invention is filed with this application.
- ☒ The invention as disclosed in the specification uses the biological material from India and the necessary permission from the competent authority shall be submitted by me before the grant of patent to me.
- ☒ There is no lawful ground of objection(s) to the grant of the patent to me. /us
- ☒ We are the true and first inventor
- ☒ We are the assignee or legal representative of true and first inventor
- ☒ The application or each of the applications, particulars of which are given in Paragraph-8, was the first application in convention country / countries in respect of my invention.
- ☒ We are claim the priority from the above mentioned application filed in convention country / countries and state that non application for protection in respect of the invention had been made in a convention country before that date by me or by any person from which I derive the title.
- ☒ Our application in India is based on international application under Patent Co-operation Treaty (PCT) as mentioned in Paragraph-9 / 2020 12 33
- ☒ The application is divided out of my application particulars of which is given in Paragraph -10 and prays that this application may be treated as deemed to have been

filed on _____ under section 16 of the Act.
☒ The said invention is an improvement in or modification of the invention particulars of which are given in Paragraph-11.

13. FOLLOWING ARE THE ATTACHMENTS WITH THE APPLICATION

(a) Form-2

Item	Details	Fee	Remarks
Complete / Provisional specification #	No. of pages - 33	Filing Rs 1,750/- Publication 2,750/-	total Rs 4,500/-
No. of claim(s)	No of claims - 8 & No. of pages - 2	-	-
Abstract	No. of pages - 1	-	-
No. of drawing(s)	No. of drawings - 6 No. of pages - 6	-	-

In case of a complete specification, if the applicant desires to adopt the drawings filed with his provisional specification as the drawings or part of the drawings for the complete specification under rule 13(4), the number of such pages filed with the provisional specification are required to be mentioned here.

- (b) Complete specification (in form with the international application) / as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies).
- (c) Sequence listing in electronic form
- (d) Drawings (in conformation with the international application) / as amended before the International Preliminary Examination Authority (IPEA), as applicable (2 copies)
- (e) Priority document(s) or a request to retrieve the priority document(s) from DAS (Digital Access Service), if the applicant had already requested the office of first filing to make the priority document(s) available to DAS.
- (f) Translation of priority document / Specification / International Search Report / International Preliminary Report on Patentability.
- (g) Statement and Undertaking on Form 3
- (h) Declaration of Inventorship on Form 5

(i) Power of Authority

(j) Controller of Patents, Chennai

Total fee Rs. 4500/- in cash / Banker's cheque / Bank draft bearing No. 218163 Date 27/7/20 on

Indian Bank Trichy Bank.

I hereby declare that to the best of my knowledge, information and belief the fact and matters stated herein are correct and I request that a patent may be granted to me for the said invention.

Dated this 27 day of 07 2020 ~~2020~~

27/07/2020

Signature : 1.



2. 

3. 

4. 

5. 

Name : 1. DR. J. CHRISTOPHER CLEMENT

2. DR. K. C. SRIHARIPRIYA

3. DR. ELIZABETH RUFUS

4. DR. JOHN RAJAN A

5. DR. G. JEGAN

To

The Controller of Patents,

The Patent Office, atChennai.....

Note:-

- ❖ Repeat boxes in case of more than one entry
- ❖ To be signed by the applicant or by authorised registered patent agent otherwise where mentioned.
- ❖ Tick / cross whichever is applicable / not applicable in declaration in paragraph-12
- ❖ Name of the inventor and applicant should be given in full, family name in the beginning.
- ❖ Strike out the portion which is/are not applicable
- ❖ For fee: See First Schedule;

PATENT OFFICE CHENNAI 31/07/2020 12:30

THE GAZETTE OF INDIA EXTRAORDINARY



700312308

FORM2

THE PATENT ACT 1970
(39 OF 1970) &
The Patents Rules, 2003
COMPLETE SPECIFICATION
(See section 10 and rule 13)

TITLE OF THE INVENTION: Consumer-ID Bisected Compound Band
Access Method for a Smart Grid System

APPLICANT**INVENTOR [1]**

[a] NAME : DR. J. CHRISTOPHER CLEMENT
[b] NATIONALITY: Indian
[c] ADDRESS : **Associate Professor**
School of Electronics Engineering
Vellore Institute of Technology
Vellore
TamilNadu – 632007
India
Mobile No: 9789340886
Email: christopher.clement@vit.ac.in

INVENTOR [2]

[a] NAME : DR. K. C. SRIHARIPRIYA
[b] NATIONALITY: Indian
[c] ADDRESS : **Associate Professor**
School of Electronics Engineering
Vellore Institute of Technology
Vellore
Tamil Nadu – 632007
India
Mobile No: 9865733011
Email: sriharipriya.kc@vit.ac.in

INVENTOR [3]

[a] NAME : DR. ELIZABETH RUFUS
[b] NATIONALITY: Indian
[c] ADDRESS : **Professor**
School of Electronics Engineering
Vellore Institute of Technology
Vellore
TamilNadu – 632007

India

Mobile No: 9677342996

Email: ElizabethRufus@vit.ac.in / 2020 12:40

INVENTOR [4]

PATENT OFFICE

[a] NAME : DR. JOHN RAJAN A

[b] NATIONALITY: Indian

[c] ADDRESS : **Professor**

Department of Manufacturing Engineering,
School of Mechanical Engineering
Vellore Institute of Technology
Vellore

Tamil Nadu - 632007

India

Mobile No: 9444119988

Email:ajohnrajan@gmail.com

INVENTOR [5]

[a] NAME : DR. G.JEGAN

[b] NATIONALITY: Indian

[c] ADDRESS : **Assistant Professor**

Department of Electronic Communication Engineering
Sathyabama Institute of Science and Technology
Chennai.

Tamil Nadu - 600119

India

Mobile No: 9043483773

Email:jjss@gmail.com

2.PREAMBLE TO THE DESCRIPTION :

-----Separate sheet is attached-----

3.COMPLETE SPECIFICATION

The following specification particularly describes the invention and the manner in which it is to be performed. -----Separate sheet is attached-----

4. DESCRIPTION

----- Separate sheet is attached -----

5. CLAIMS

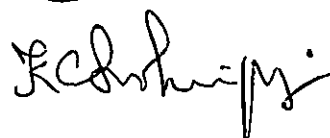
----- Separate sheet is attached -----

6. DATE: 27/07/2020

Signature: 1.



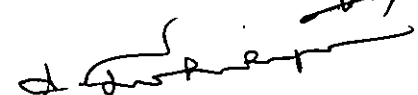
2.



3.



4.



5.

 PATENT OFFICE CHENNAI 31/07/2020 12:40

Name : 1. DR. J. CHRISTOPHER CLEMENT

2. DR. K. C. SRIHARIPRIYA

3. DR. ELIZABETH RUFUS

4. DR. JOHN RAJAN A

5. DR. G.JEGAN

7. ABSTRACT OF THE INVENTION

----- Separate sheet is attached -----

Note:-

- ❖ Repeat boxes inn case of more than one entry.
- ❖ To be signed by the applicant(s) or by authorized registered patent agent otherwise where mentioned.
- ❖ Tic(✓)/cross(x) whichever is applicable/not applicable in declaration in para-9.
- ❖ Name of the Inventor and applicant should be given in full, family name in the beginning.
- ❖ Complete address of the inventor and applicant should be given stating the postal Index no./code, state and country,
- ❖ Strike out the column which is/are not applicable

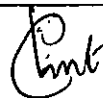
**Form 3**

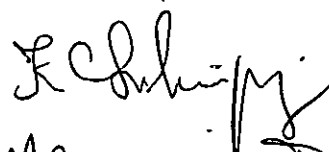
THE PATENTS ACTS, 1970
(39 of 1970) &
The Patents Rules, 2003
STATEMENT AND UNDERTAKING UNDER SECTION 8
(See Section 8, Rule 12)

1. Name of the applicant			We 1. DR. J. CHRISTOPHER CLEMENT 2. DR. K. C. SRIHARIPRIYA 3. DR. ELIZABETH RUFUS 4. DR. JOHN RAJAN A 5. DR. G.JEGAN hereby declare that		
6. Name, Address and Nationality of the joint applicant			i. That I have not made any application for the same / substantially the same invention outside India ii. That I, who have made this application Number _____ dated _____ alone, made for the same / substantially the same invention, application for the patent in other Countries, the particulars of which are given below:		
Name of the Country	Date of Application	Application Number	Status of application	Date of publication	Date of grant
N/A	N/A	N/A	N/A	N/A	N/A
7. Name and Address of the Assignee			iii. That the rights in the application has been to _____ _ that I undertake that upto the date of grant of the patent by the Controller, I would keep him involved in writing the details regarding corresponding applications for the patents filed outside India within six months from the date of filing of such application. Date:		
8. To be signed by the applicant or his authorized registered patent agent			- NO - 31 / 07 / 2020 12:30		

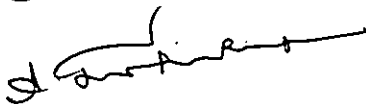
9. Name of the natural person
who has signed.

Signature : 1.



2. 

3. 

4. 

5. 

Name : 1. DR. J. CHRISTOPHER CLEMENT

2. DR. K. C. SRIHARIPRIYA

3. DR. ELIZABETH RUFUS

4. DR. JOHN RAJAN A

5. DR. G. JEGAN

27/7/2020

To

The Controller of Patents,
The Patent Office,

At Chennai

Note:- Strike out whichever is not applicable

PATENT OFFICE CHENNAI 31/07/2020 12:30

**FORM 5**

THE PATENTS ACT, 1970
(39 of 1970) &
The Patents Rules, 2003
DECLARATION AS TO INVENTORSHIP
[See section 10(6) and rule 13(6)]

1. NAME OF APPLICANT

1. DR. J. CHRISTOPHER CLEMENT
2. DR. K. C. SRIHARIPRIYA
3. DR. ELIZABETH RUFUS
4. DR. JOHN RAJAN A
5. DR. G.JEGAN

hereby declare that the true and first inventor of the invention disclosed in the complete specification filed in pursuance of my application numbered _____ dated _____ is

INVENTOR [1]

[a] NAME : DR. J. CHRISTOPHER CLEMENT
[b] NATIONALITY: Indian
[c] ADDRESS : **Associate Professor**
School of Electronics Engineering
Vellore Institute of Technology
Vellore
TamilNadu – 632007
India
Mobile No: 9789340886
Email: christopher.clement@vit.ac.in

INVENTOR [2]

[a] NAME : DR. K. C. SRIHARIPRIYA
[b] NATIONALITY: Indian
[c] ADDRESS : **Associate Professor**
School of Electronics Engineering
Vellore Institute of Technology
Vellore
Tamil Nadu – 632007
India
Mobile No: 9865733011
Email: sriharipriya.kc@vit.ac.in

INVENTOR [3]

[a] NAME : DR. ELIZABETH RUFUS
[b] NATIONALITY: Indian

31/07/2020 12:30

PATENT OFFICE CHENNAI

30-Jul-2020/66179/202041032691/Form 5

[c] ADDRESS : Professor

School of Electronics Engineering
Vellore Institute of Technology
Vellore
TamilNadu – 632007

India

Mobile No: 9677342996

Email:elizabethrufus@vit.ac.in

INVENTOR [4]

[a] NAME : DR. JOHN RAJAN A

[b] NATIONALITY: Indian

[c] ADDRESS : Professor

Department of Manufacturing Engineering,
School of Mechanical Engineering
Vellore Institute of Technology
Vellore

Tamil Nadu – 632007

India

Mobile No: 9444119988

Email:ajohnrajan@gmail.com

INVENTOR [5]

[a] NAME : DR. G.JEGAN

[b] NATIONALITY: Indian

[c] ADDRESS : Assistant Professor

Department of Electronic Communication Engineering
Sathyabama Institute of Science and Technology
Chennai.

Tamil Nadu – 600119

India

Mobile No: 9043483773

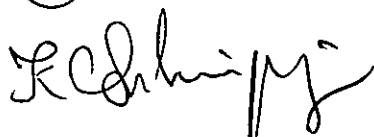
Email:jjss@sjss@gmail.com

Date: 27/7/2020

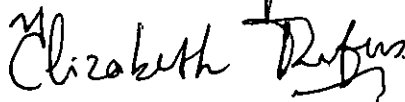
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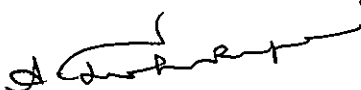
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Name of the signatory:

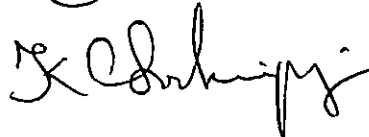
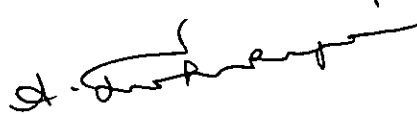
CHENNAI 31/07/2020 12:40
1. DR. J. CHRISTOPHER CLEMENT

2. DR. K. C. SRIHARIPRIYA
3. DR. ELIZABETH RUFUS
4. DR. JOHN RAJAN A
5. DR. G.JEGAN

3. DECLARATION TO BE GIVEN WHEN THE APPLICATION IN INDIA IS FILED BY THE APPLICANT IN THE CONVENTION COUNTRY:-

I, the applicant in the convention country hereby declare that my right to apply for a patent in India is by way of assignment from the true and first inventor

Date: 27/7/2020

Signature: 1. 
2. 
3. 
4. 
5. 

Name of the signatory:-

1. DR. J. CHRISTOPHER CLEMENT
2. DR. K. C. SRIHARIPRIYA
3. DR. ELIZABETH RUFUS
4. DR. JOHN RAJAN A
5. DR. G.JEGAN

4. STATEMENT (to be signed by the additional inventor not mentioned in the application form)

I assent to the invention referred to in the above declaration, being included in the complete

specification filed in pursuance of the stated application.

Date:

Signature of the additional inventor(s):-

Name:-

To

The Controller of Patent,
The Patent Office, at...Chennai

Note:-

- ❖ Repeat boxes in case of more than one entry.
- ❖ To be signed by the applicant(s) or by authorized registered patent agent
Or otherwise where mentioned.
- ❖ Tic(√)/cross(x) whichever is applicable/not applicable in declaration in para-9.
- ❖ Name of the Inventor and applicant should be given in full, family name in the beginning.
- ❖ Complete address of the inventor and applicant should be given stating the postal Index no./code, state and country,
- ❖ Strike out the column which is/are not applicable



700312306

CBR: 24713
DATE: 30/07/2020
AM: 4500/-
P.V.
30/07/20

FORM 9

**THE PATENTS ACT, 1970
(39 of 1970)
&
The Patents Rules, 2003
REQUEST FOR PUBLICATION
[See Section 11A(2): rule 24A]**

1. Name, address and nationality of the applicants:

INVENTOR [1]

[a] NAME : DR. J. CHRISTOPHER CLEMENT

[b] NATIONALITY: Indian

[c] ADDRESS : Associate Professor

School of Electronics Engineering

Vellore Institute of Technology

Vellore

TamilNadu – 632007

India

Mobile No: 9789340886

Email:christopher.clement@vit.ac.in

INVENTOR [2]

[a] NAME : DR. K. C. SRIHARIPRIYA

[b] NATIONALITY: Indian

[c] ADDRESS : Associate Professor

School of Electronics Engineering

Vellore Institute of Technology

Vellore

Tamil Nadu – 632007

India

Mobile No: 9865733011

Email:sriharipriya.kc@vit.ac.in

30-Jul-2020/66179/202041032691/Form 9

PATENT OFFICE CHENNAI 31/07/2020 12:40

INVENTOR [3]

[a] NAME : DR. ELIZABETH RUFUS

[b] NATIONALITY: Indian

[c] ADDRESS : **Professor**

School of Electronics Engineering
Vellore Institute of Technology
Vellore

Tamil Nadu – 632007

India

Mobile No: 9677342996

Email:elizabethrufus@vit.ac.in

INVENTOR [4]

[a] NAME : DR. JOHN RAJAN A

[b] NATIONALITY: Indian

[c] ADDRESS : **Professor**

Department of Manufacturing Engineering,
School of Mechanical Engineering
Vellore Institute of Technology
Vellore

Tamil Nadu – 632007

India

Mobile No: 9444119988

Email:ajohnrajan@gmail.com

INVENTOR [5]

[a] NAME : DR. G.JEGAN

[b] NATIONALITY: Indian

[c] ADDRESS : **Assistant Professor**

Department of Electronic Communication Engineering

Sathyabama Institute of Science and Technology
Chennai

Tamil Nadu – 600119

India

Mobile No: 9043483773

Email:jjsfss@gmail.com

PATENT OFFICE CHENNAI 31/07/2020 12:40

2. To be signed by the applicant or hereby request for early publication of my his
authorized registered patent application for Patent No. _____

Dated _____ under section 11A(2) Act.

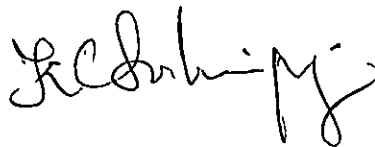
Date: 27/7/2020

3. Name of the natural person who has signed.

SIGNATURE: 1.



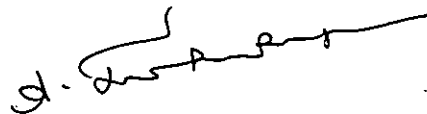
2.



3.



4.



5.



NAME: 1. DR. J. CHRISTOPHER CLEMENT

2. DR. K. C. SRIHARIPRIYA

3. DR. ELIZABETH RUFUS

4. DR. JOHN RAJAN A

5. DR. G. JEGAN

To

The Controller of Patents,
The Patent Office,
Guindy,

Chennai-600 032.

PATENT OFFICE CHENNAI 31/07/2020 12:40

30-Jul-2020/66179/202041032691/Form 9

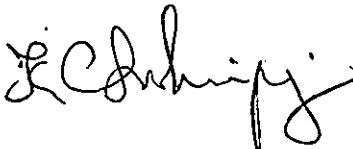
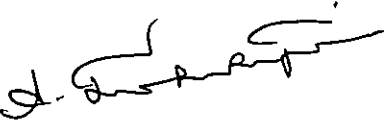
Title: Consumer-ID Bisected Compound Band Access Method for a Smart Grid System

ABSTRACT

The present invention relates in general to wireless radio communication and in particular to band accessing method used in smart gridsystems. A compound band accessing system for data exchange between energy meter and smart grid, using a unique consumer ID, operating according to a method is disclosed. The method of obtaining a unique consumer ID involves the generation of a sequence of periodic binary digits, that possess an adequate correlation proper- ties. Another method and system for identifying the free radio band for compound accessing is disclosed as well, for the effective band utilization. Moreover, a system for accommodating and exchanging the smart meter data of all consumers of a particular geographical region, at the same time, within an identified band is also disclosed in this invention.

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Title: Consumer-ID Bisected Compound Band Access Method for a Smart Grid System

CLAIM

1. Consumer ID bisected compound band accessing system (1) for a smart grid, comprising
 - Band handler (10), which can scan, identify the unused band for compound accessing and store it in a memory of processing module-1 (13).
 - Consumer ID generator (20), that generates a unique consumer IDs (24) possessing a few predetermined properties and broadcasts them to consumer premise areas (40, 50).
 - Smart meter data exchanging system (53), in said consumer premise area (40,50), which mixes the said consumer ID (24) with the said meter data(51) and transmits it over said available band, through compound band accessing. The properties of said consumer IDs (24) ensure no interference between said consumers' data, even if they are transmitted at the same time over a said band.
2. Consumer ID bisected compound band accessing system, according to claim 1, wherein the said band handler (10) comprises:
 - Radio module (11), which can receive, process and transmit radio signals, when interfaced with said processing module (13), and
 - Processing module (13) to interface said radio module (11) through an interfacing cable (14). The module also contains band scanner (12) to tune and identify the unused radio bands for compound accessing.
3. Consumer ID bisected compound band accessing system, according to claim 1, wherein the said consumer ID generator (20) comprises:
 - Processing module (21) to implement the method for generating the ID (24)
 - a method for generating said consumer ID (24) that possess a few predetermined properties.
 - a broadcaster (23), using its communication module, distributes the said consumer IDs (24) to consumer premise areas (40, 50).
4. Method of generating a unique consumer ID for the said meter, in a smart grid system (1), comprising the steps of:
 - Determining (221) M value, being a maximum sequence length satisfying a few predetermined properties, and loading it in the memory of processing module (21):
 - Initializing (222) M bits in the said memory of processing module (21), being an initiative to achieve the predetermine state.
 - Devising (223) a timer in the said processing module (21), to organize the synchronisation of shifting and logical functioning.
 - Shifting, (224) in the said processing module (21), the said M bits right, one at a time, according to said timing control.
 - Implementing said logic function (225), being an operation performed on M bits, in the said processing module (21), synchronized with the said timer.
 - Feedback module (226) to feed a bit at a time, synchronized with a said timing control, back to a said shifter, method for identifying the free band for compound access in a smart grid system (1), comprising the steps of:

5. A method for identifying the free band for compound access in a smart grid system (1), comprising the steps of:

- Tuning (121) the band of interest, using radio module (11)
- Acquiring (122) predefined number of signal samples using radio module (11)
- Computing (123), in said processing module-1 (13), the energy contained within the signal samples
- Comparing (124) the computed energy with the predetermined threshold to check whether the band is free or in use.
- Reserving (125) the identified free band for future use in a memory of processing module-1 (13).

6. Method according to claim 5, wherein said number of samples is determined according to Nyquist theorem, which demands sampling frequency being twice that of maximum frequency of said band of interest.

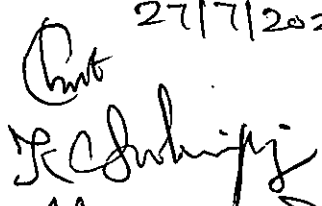
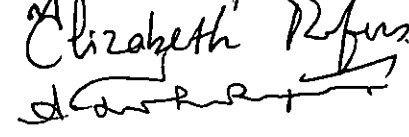
7. Method according to claim 5, wherein said threshold is determined from the false alarm probability, a measure being an indicative of chance of declaring the band occupied, when it is actually not.

8. Consumer ID bisected compound band accessing system, according to claim 1, wherein the smart meter data exchanging system (53), further comprises:

- Software Radio Module (533)
- Processing Module-3 (533) the processing module-3 (533), further comprises:
 - a mixer module (532), which can mix said consumer ID sequence and data from energy meter for compound band access.
 - a multiplier module (531), which can up shifts the frequency of said mixed module's output, makes the resultant signal eligible for transmission.

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Preamble to the Description

Smart grid is an upcoming technology that modernizes the traditional grids by incorporating communication techniques in its links. Today's requirements on electricity generation and distribution are difficult to be met using the traditional grid systems. In traditional grid systems, power flows in one direction, whereas in smart grid, power and data to be exchanged flows bidirectional. Smart grid dynamically adjusts the behaviour of consumers and energy distributors based on the data collected from meters embedded with intelligence and advanced infrastructures. The central unit of the advanced metering infrastructures include a few communication systems and the methods, which driving those systems. Therefore, the smart grid systems enable the customers exchange the meter recorded data and take part in the electricity marketing as well. A smart grid communication network can include home area network, local area network and wide area network and so on. While the grid, embedded with a communication system is of remarkable use, the demand to meet the spectrum requirement of data transmission of all consumers of a particular geographical zone is a bottleneck, as per the conventional spectrum management policy. Federal communications commission has paved the way to resolve this problem using the standards of wireless regional area network, which enable an unlicensed user to use the unused spectrum bands. It is proved that a major portion of very high and ultra-high frequency bands are unused. The bands are not occupied in most of the geographical locations for a longer period of time.

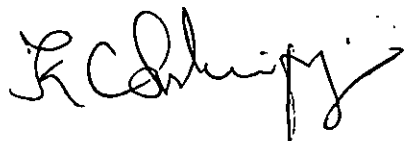
WRAN standard assigns those bands to the unlicensed users without intervening the licensed user's transmission. The current invention relates to the smart grid system with consumer-ID bisected compound accessing methods for the identified free band. It is to be noted that the current invention can accommodate the data transmission of all consumers of particular geographical zone over an identified band at the same time without causing interference to others' data. In the published U.S. patent US 9473830 B2, a smart metering system using a white space band is disclosed. A sensor installed in a defined area scans the broadcast channel for its availability. Based on this scanning result, a management server assigns the unused band for wireless data exchange between smart meter and a grid.

In the patent EP2897299A1, A method to be performed by a substation component when a first component communicates with a second component of a smart grid network is proposed. In this proposal a method of selecting a substation component as a relay for bidirectional communication and a way of combining two signals at the physical layer from two substation component is patented. In the patent WO2015089448A1, a method and apparatus performing secure communication in a smart grid network is presented, in which spread crypto- graphic, key management scheme is used for communication security.

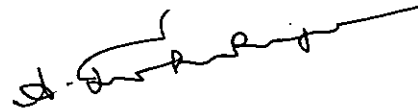
However the system in prior art does not address a band accessing scheme.

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COMPLETE SPECIFICATION

Specification of Energy Meter: ELTRAC ET4001 P & E with Serial Communication, 85 - 270V AC/DC, 415 V, 3 Phase with external CT

Specification of Radio Peripheral: Universal Radio Peripheral NI 2901

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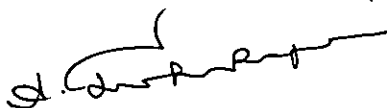
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Title: Consumer-ID Bisected Compound Band Access Method for a Smart Grid System

DESCRIPTION

A general object of the present invention is to identify a free band for power consumers' data transmission. A further object is to generate a unique consumer ID, which possess the required correlation properties. Yet another object is to provide a system with a consumer-ID bisected compound band access method, so that the consumers' big data can be transmitted over an identified band at the same time. The above objects are achieved by systems, methods and devices according to the enclosed claims. In a first aspect, a method for detecting the free band for smart meter data transmission comprises energy detector followed by a threshold operation. According to a second aspect, a method for obtaining a unique consumer ID, comprises a process of generating the ID's that possess minimum correlations between each other, while maintaining a maximum correlation among themselves.

According to a third aspect, a system for compound band accessing, comprises, a frequency up-converter, which shifts the centre frequency of a smart meter data to a higher level, and makes it suitable for transmission. In addition, the system comprises, a multiplier which multiplies the frequency shifted data and the consumer ID, so that consumers' data can be transmitted over the single available band at the same time without causing interference to each other, and makes the data retrieval at the other side easy.

The components of the exemplary embodiment will be clearly understood from the following description about the drawings, in which: Fig. 1 shows a pictorial representation of a consumer-ID bisected compound band accessing smart grid data exchanging system, according to an exemplary embodiment; Fig. 2 pictures a band handler system, which takes care of tuning, scanning and identifying the unused radio band, according to an exemplary embodiment; Fig. 3 depicts an arrangement of a consumer ID manager, which produces a unique ID for a compound band accessing system, according to an exemplary embodiment; Fig. 4 shows a smart meter data exchanging system, comprising multiplier, mixer and software radio module, which can mix the said consumer ID and smart meter data for compound band accessing system, according to an exemplary embodiment; Fig. 5 illustrates an arrangement of the modules, which can generate a unique consumer ID, as per the requirement of system (22) in Fig. 3, according to an exemplary embodiment; Fig. 6 shows the modules, which are included in the said band scanner system (12) Shown in Fig. 2, according to an exemplary embodiment; Fig. 7 shows a method implemented in a processing module-2 (21) of a said consumer ID manager (20), according to an exemplary embodiment; Fig. 8 describes a method implemented in a processing module-1 (13) of a said band handler (10), according to an exemplary embodiment; Fig. 9 depicts a system modules included in a said smart meter data exchanging system (53), for expanding the smart meter data over a wider identified band, according to an exemplary embodiment;

In the drawings, corresponding reference numbers are used for similar or corresponding parts.

The schematic representation of a current invention is presented in Fig. 1. The invention proposes a method for consumer-ID bisected compound band access for smart grid system. Fig. 1 depicts a grid system with the dotted lines denote communication links. Fig. 1 pictures the consumer premise areas including household buildings and industries. Consumer premise areas are provided with the smart metering infrastructure, comprising, RF transmitter/receiver modules, metering system to record the energy consumption, frequency up/ down converters and signal multipliers to mix the data with consumer IDs. The role of consumer ID manager in Fig. 1 is to generate the unique IDs that possess zero cross correlation and maximum autocorrelation properties.

Fig. 1 pictures the band handling unit as well, which comprises RF transmitter/receiver modules, band scanner, storage unit to reserve the number of available free bands and frequency up/down converters. Spectrum handler in Fig. 1 is also featured with the method to perform band scanning. One of the methods include energy detection, which computes energy of the signal received in a band followed by its comparison with the pre-set threshold to make up a decision about band occupancy.

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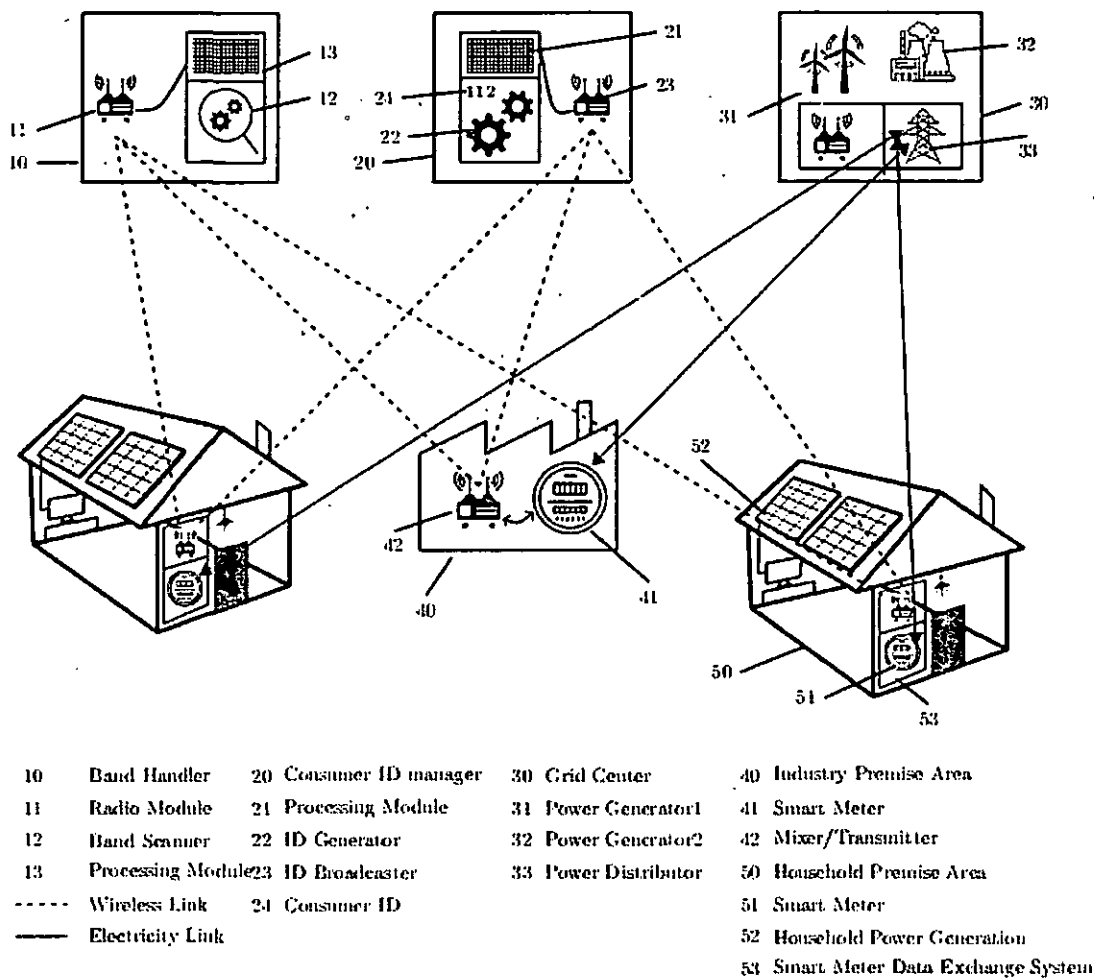


Figure 1: Schematic of Consumer ID Bisected Compound Band Access

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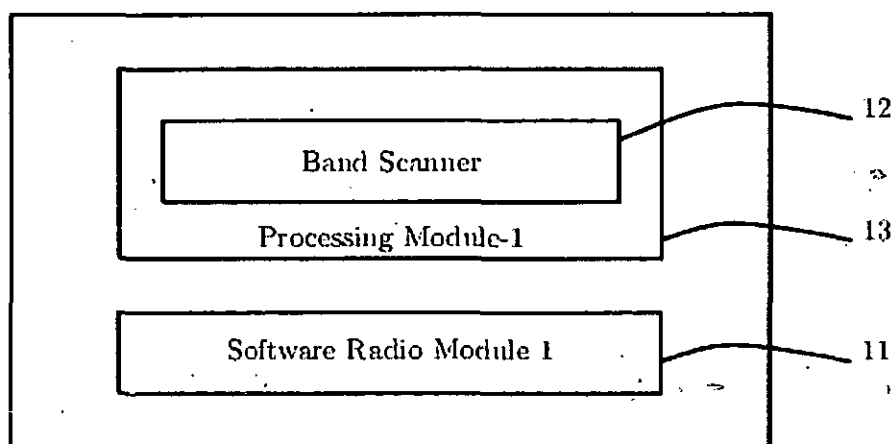


Figure 2 Band Handler

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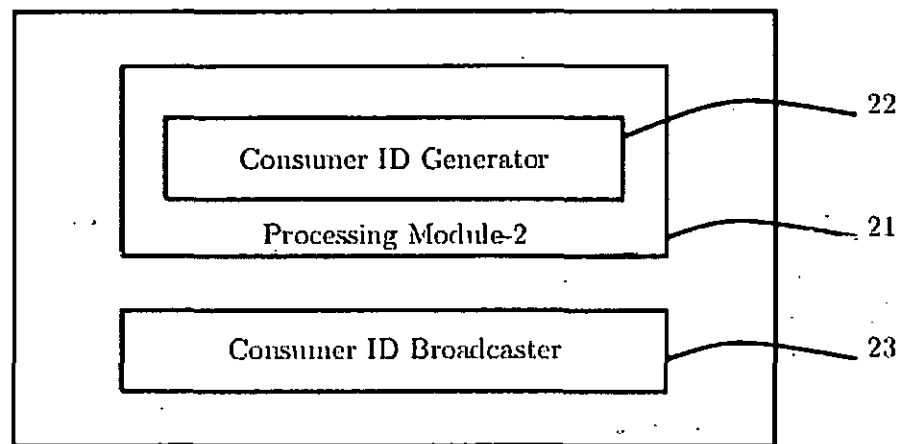


Figure 3: Consumer ID Manager

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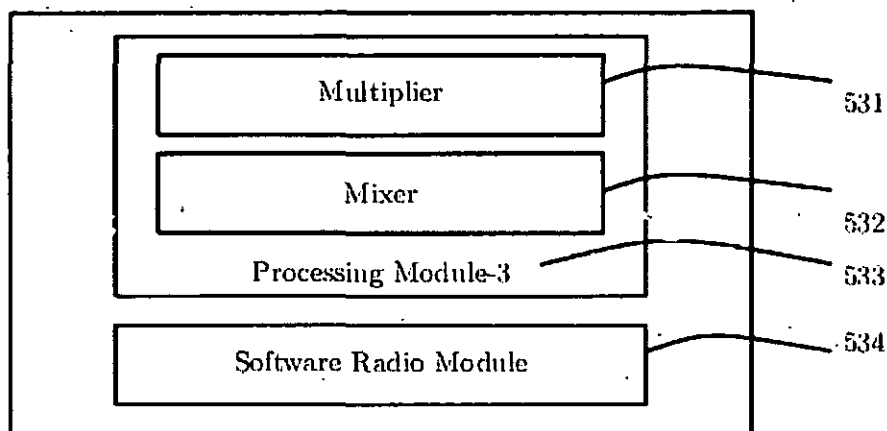


Figure 4: Smart Meter Data Exchanging System

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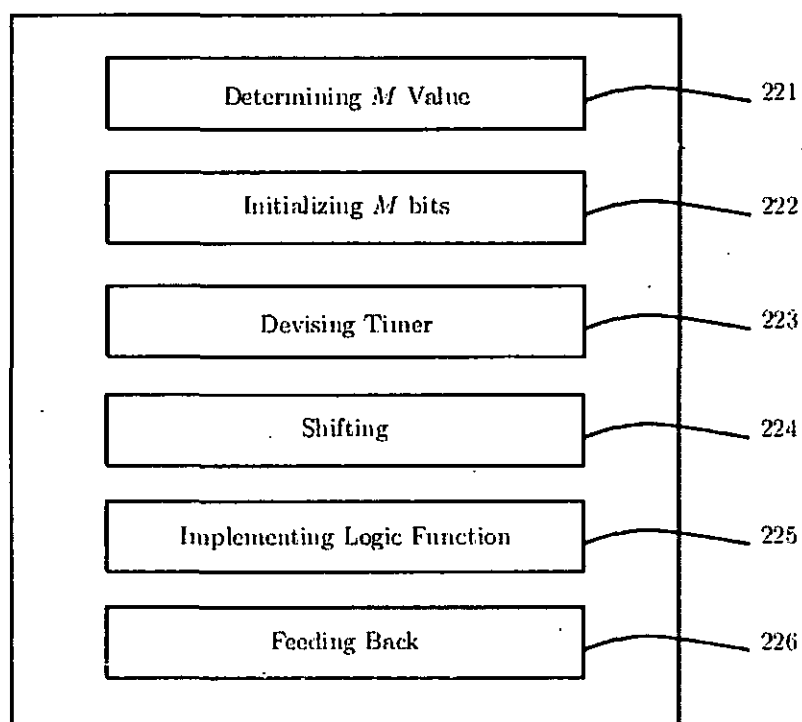


Figure 5: Consumer ID Generator

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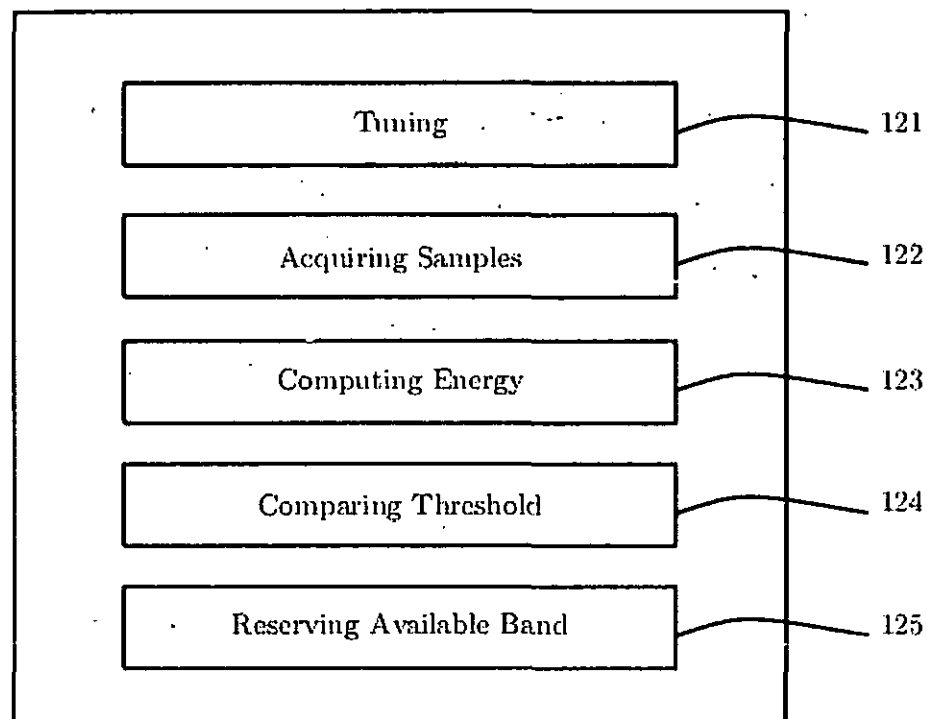


Figure 6: Band Scanner

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