NAME: SRM INSTITUTE OF SCIENCE AND TECHNOLOGY NO. OF SHEETS: 04

NO.: 2024…….. SHEET NO.: 01

COMPLETE SPECIFICATION

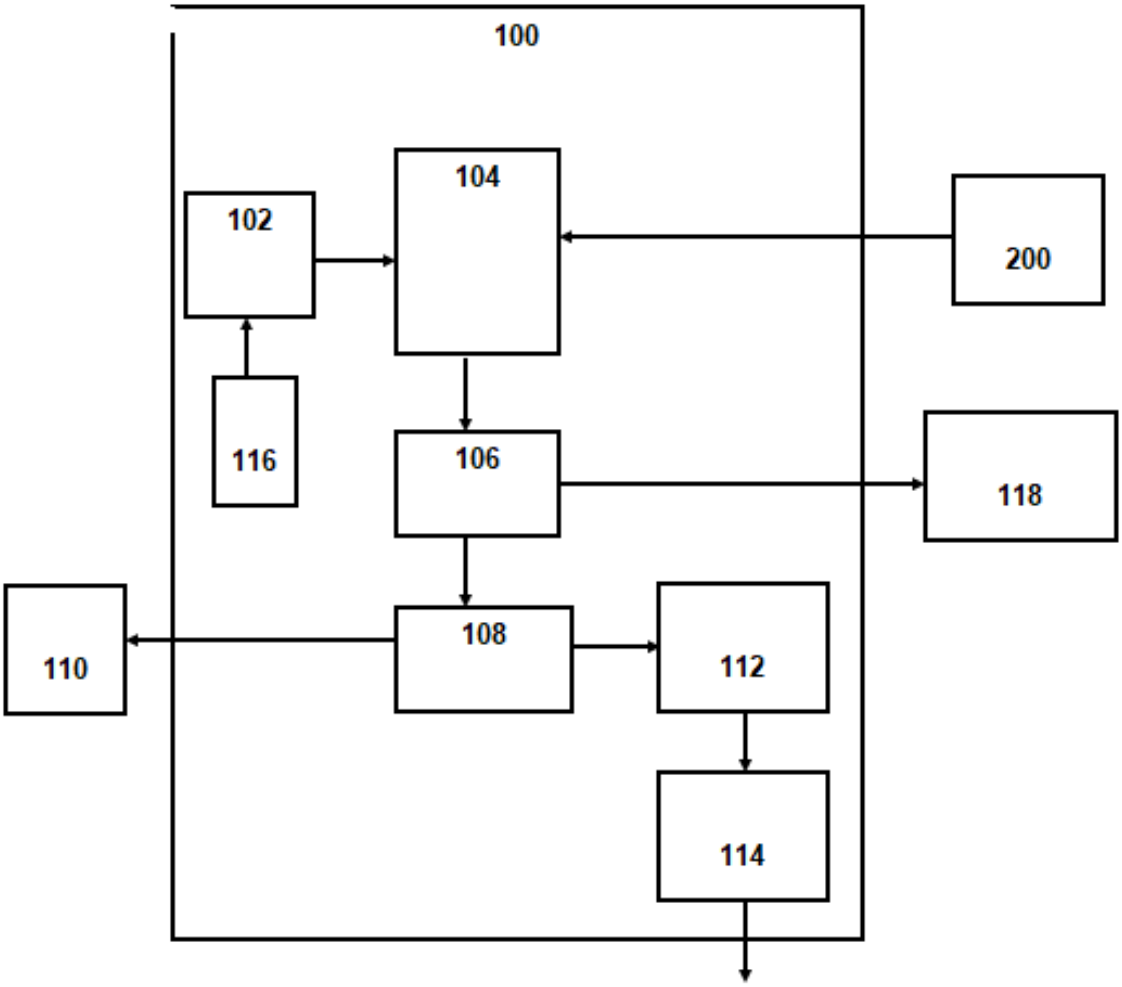

FIGURE 1

MOHAN RAJKUMAR DEWAN, IN/PA-25
OF R. K. DEWAN & CO.
APPLICANT'S PATENT ATTORNEY

COMPLETE SPECIFICATION

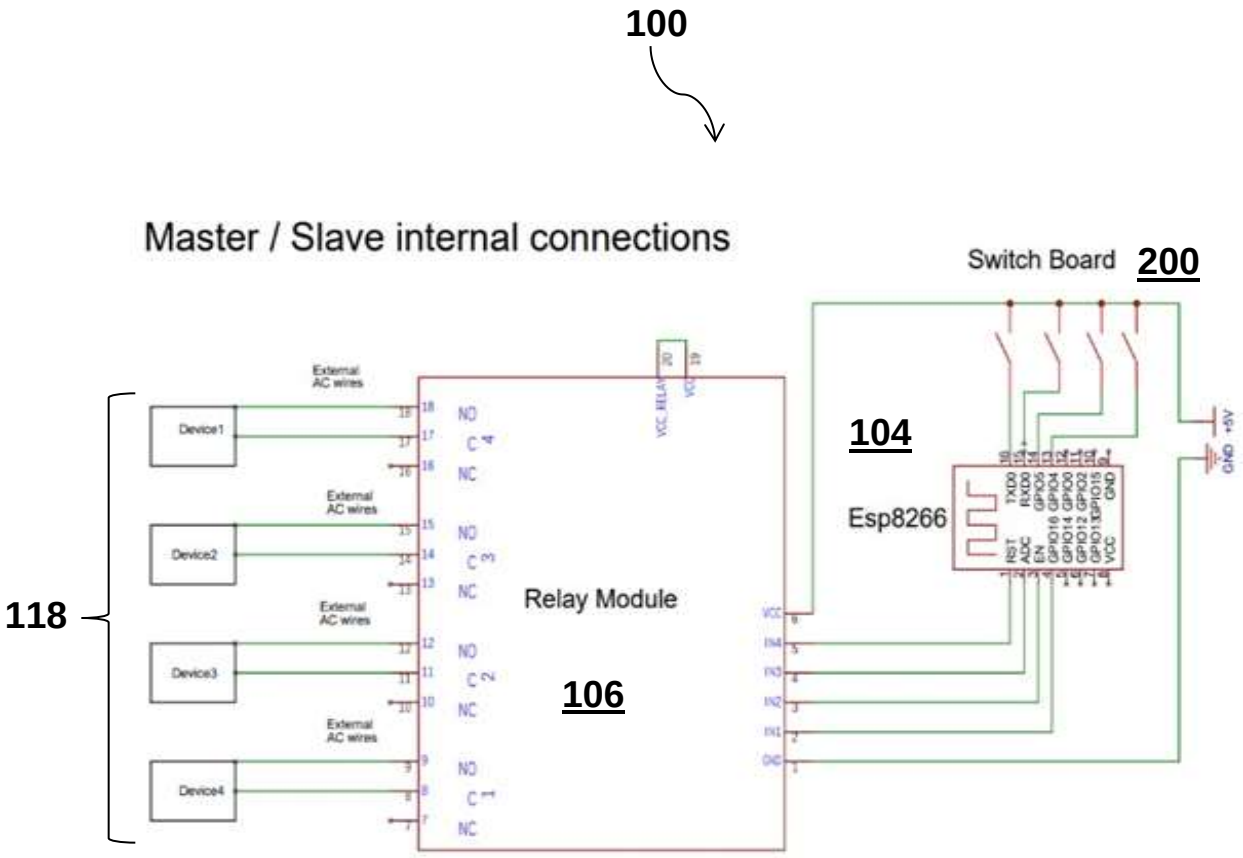

FIGURE 2

MOHAN RAJKUMAR DEWAN, IN/PA-25
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COMPLETE SPECIFICATION

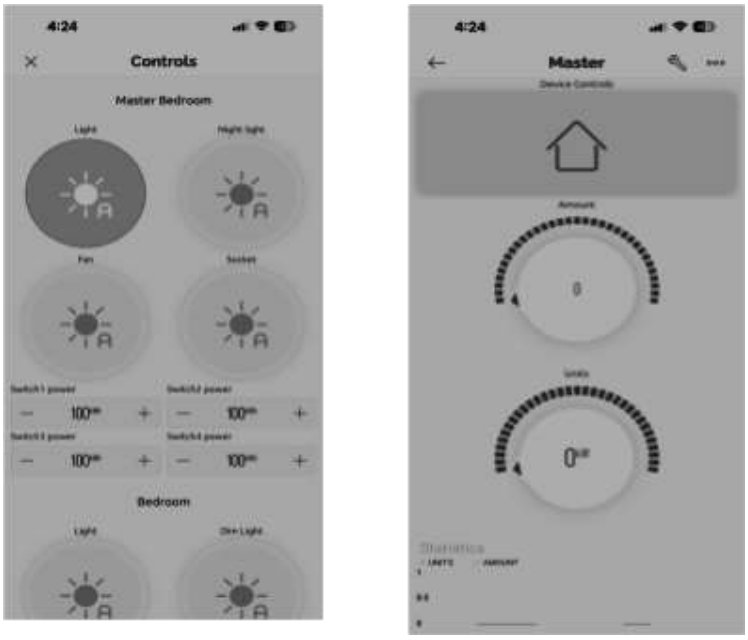

FIGURE 3

FIGURE 4

MOHAN RAJKUMAR DEWAN, IN/PA-25
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APPLICANT'S PATENT ATTORNEY

COMPLETE SPECIFICATION

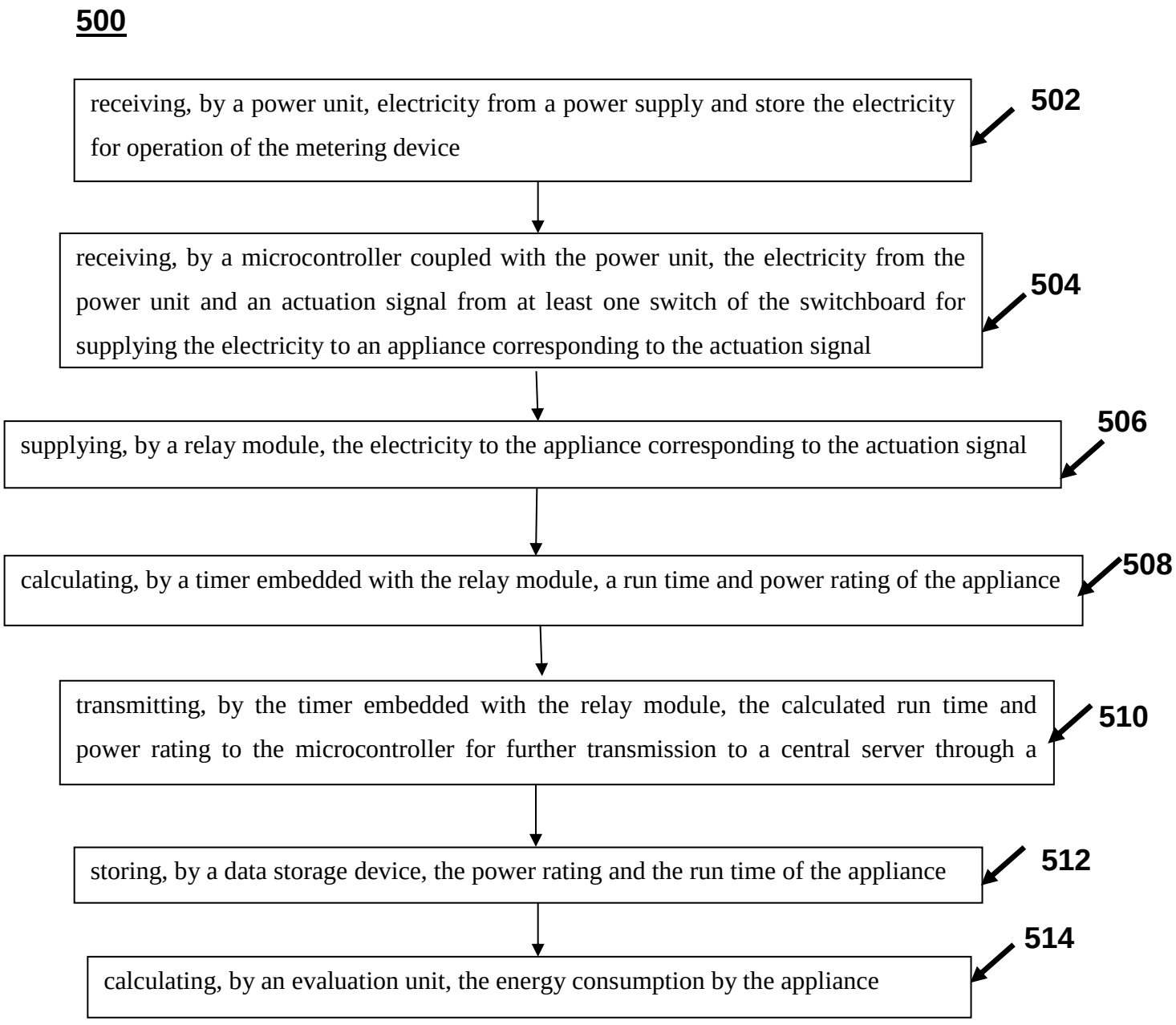

FIGURE 5

MOHAN RAJKUMAR DEWAN, IN/PA-25
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FORM 2

THE PATENTS ACT, 1970

(39 of 1970)

&

THE PATENTS RULES, 2003

COMPLETE SPECIFICATION

(See section 10 and rule 13)

1. Title of the Invention

A METERING DEVICE AND A METHOD FOR AUTOMATED ANALYSIS OF ELECTRICITY CONSUMPTION BY EACH APPLIANCE

2. Applicant(s)

Name	Nationality	Address
SRM INSTITUTE OF SCIENCE AND TECHNOLOGY	INDIAN	Kattankulathur, Chennai-603203, Tamil Nadu, India

3. Preamble to the description

The following specification particularly describes the invention and the manner in which it is to be performed

TECHNICAL FIELD

[0001] The present disclosure relates, in general, to the field of Internet of Things (IoT) technology and metering of energy consumption. More particularly, embodiments of the present disclosure relate to a metering device and method for automated analysis of electricity consumption by each appliance operated through a switchboard.

BACKGROUND

[0002] The background information herein below relates to the present disclosure but is not necessarily prior art.

[0003] In the present era, the proliferation of smart devices promises convenience, energy efficiency, and interconnected living. Moreover, the emphasis on energy efficiency not only reduces our environmental footprint but also leads to cost savings, making smart devices a win-win for both consumers and the planet. By navigating this era of rapid technological advancement, the possibilities for an interconnected future are boundless, promising a lifestyle where the existing devices work harmoniously to enhance the quality of life.

[0004] However, the existing landscape of smart technologies exhibits several limitations and challenges that hinder their widespread adoption and effectiveness. The prevailing smart energy meters, while providing valuable data on overall energy consumption, lack the ability to offer granular statistics analysis of individual appliances. These meters typically rely on an extensive array of voltage and current sensors, making them complex and costly to deploy. Many smart appliances on the market today suffer from limited interoperability. Devices produced by different manufacturers often use incompatible communication protocols, preventing seamless data exchange and coordination between them. This lack of compatibility restricts the potential benefits of a truly interconnected smart home. While voice-controlled virtual assistants have gained popularity, managing smart appliances through these systems can be expensive and entail

ongoing maintenance challenges. Users may face issues with system compatibility and rely on a single ecosystem, limiting their choices.

[0005] Therefore, there is a need for a device and method for automated analysis of electricity consumption by each appliance operated through a switchboard to optimize electricity consumption by leveraging historical consumption data and insights.

OBJECTS

[0006] Some of the objects of the present disclosure, which at least one embodiment herein satisfies, are as follows.

[0007] It is an object of the present disclosure to ameliorate one or more problems of the prior art or to at least provide a useful alternative.

[0008] The main object of the present disclosure is to provide a device and method for automated analysis of electricity consumption by each appliance operated through a switchboard to optimize electricity consumption by leveraging historical consumption data and insights.

[0009] Another object of the present disclosure is to provide a device for automated analysis of electricity consumption by

[0010] Another object of the present disclosure is to provide a device for automated analysis of electricity consumption providing real-time feedback on electricity consumption.

[0011] Another object of the present disclosure is to provide a device for automated analysis of electricity consumption to generate electricity bills for each appliance.

[0012] Another object of the present disclosure is to provide a device for automated analysis of electricity consumption that can be used with the existing switchboards.

[0013] Another object of the present disclosure is to provide a user-friendly device for automated analysis of electricity consumption.

Another object of the present disclosure is to provide a device for automated analysis of electricity consumption having firmware reliability for hassle-free firmware upgrades, ensuring ongoing reliability and performance.

[0014] Another object of the present disclosure is to provide a device for automated analysis of electricity consumption having versatility in building compatibility.

[0015] Another object of the present disclosure is to provide a very cost-effective and low maintenance device for automated analysis of electricity consumption

[0016] Other objects and advantages of the present disclosure will be more apparent from the following description when read in conjunction with the accompanying figures, which are not intended to limit the scope of the present disclosure.

SUMMARY

[0017] This summary is provided to introduce concepts related to a metering device and method for automated analysis of electricity consumption by each appliance operated through a switchboard. The concepts are further described below in the following detailed description. This summary is not intended to identify essential features of the claimed subject matter nor is it intended for use in determining or limiting the scope of the claimed subject matter.

[0018] The present disclosure envisages a metering device for automated analysis of electricity consumption by each appliance operated through a switchboard. The metering device comprises a power unit, a microcontroller, a relay module, a timer, a data storage device, and an evaluation unit.

[0019] In the metering device, the power unit is configured to receive electricity from a power supply and store the electricity for the operation of the metering device. The microcontroller is configured to couple with the power unit

to receive the electricity and to receive an actuation signal from at least one switch of the switchboard for supplying the electricity to an appliance corresponding to the actuation signal. The relay module is configured to cooperate with the microcontroller to supply the electricity to the appliance corresponding to the actuation signal. The timer is configured to cooperate with the relay module to calculate the run time and power rating of the appliance. The timer is further configured to transmit the calculated run time and power rating to the microcontroller for further transmission to a central server through a communication network. The data storage device is configured to cooperate with the central server to store the power rating and the run time of the appliance. The evaluation unit is configured to cooperate with the data storage device to receive the power rating and the run time of the appliance to calculate energy consumption by the appliance.

[0020] In an aspect, the microcontroller has a communication module configured to communicate with a communications router, for transmission of the calculated run time and power rating to the central server through the communication network.

[0021] In an aspect, the power unit is a rechargeable battery.

[0022] In an aspect, the rechargeable battery is connected to the power supply through a battery management system (BMS).

[0023] In an aspect, the central server is implemented as a web platform providing a user interface for a mobile application and a web application.

[0024] In an aspect, the communication module is configured to communicate with the communications router, over a short range connection.

[0025] In an aspect, the short range connection includes a WiFi connection.

[0026] In an aspect, the metering device is a Blynk Internet of Things (IoT) device.

[0027] In an aspect, the microcontroller is operable on an over-the-air (OTA) technology to receive firmware updates over a wireless connection.

[0028] The present disclosure further envisages a method for automated analysis of electricity consumption by each appliance operated through a switchboard. The method comprises the steps of:

- receiving, by a power unit, electricity from a power supply and storing the electricity for operation of the metering device;
- receiving, by a microcontroller, the electricity from the power unit and an actuation signal from at least one switch of the switchboard for supplying the electricity to an appliance corresponding to the actuation signal;
- supplying, by a relay module, the electricity to the appliance corresponding to the actuation signal;
- calculating, by a timer embedded with the relay module, a run time and power rating of the appliance;
- transmitting, by the timer embedded with the relay module, the calculated run time and power rating to the microcontroller for further transmission to a central server through a communication network;
- storing, by a data storage device, the power rating and the run time of the appliance; and
- calculating, by an evaluation unit, the energy consumption by the appliance.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWING

[0029] A metering device and method for automated analysis of electricity consumption by each appliance operated through a switchboard of the present disclosure will now be described with the help of the accompanying drawing, in which:

[0030] **Figure 1** illustrates an architecture of a metering device for automated analysis of electricity consumption by each appliance operated through a switchboard, in accordance with an embodiment of the present disclosure;

[0031] **Figure 2** illustrates architecture of a test circuit Pin diagram of the metering device for automated analysis of electricity consumption, with reference to **Figure 1**;

[0032] **Figure 3** illustrates an exemplary view of a mobile dashboard, in accordance with an embodiment of the present disclosure;

[0033] **Figure 4** illustrates an exemplary visualisation of a test setup, in accordance with an embodiment of the present disclosure; and

[0034] **Figure 5** illustrates a method for automated analysis of electricity consumption by each appliance operated through a switchboard, in accordance with an embodiment of the present disclosure.

LIST OF REFERENCE NUMERALS USED IN THE DESCRIPTION AND DRAWING:

100	Metering device
102	Power unit
104	Microcontroller
106	Relay module
108	Timer
110	Central server
112	Data storage device
114	Evaluation unit
116	Battery management system (BMS)

118	Appliances
200	Switchboard
300	Mobile application
400	Web application

DETAILED DESCRIPTION

[0035] Embodiments, of the present disclosure, will now be described with reference to the accompanying drawing.

[0036] Embodiments are provided so as to thoroughly and fully convey the scope of the present disclosure to the person skilled in the art. Numerous details are set forth, relating to specific components and methods to provide a complete understanding of embodiments of the present disclosure. It will be apparent to the person skilled in the art that the details provided in the embodiments should not be construed to limit the scope of the present disclosure. In some embodiments, well-known apparatus structures, and well-known techniques are not described in detail.

[0037] The terminology used, in the present disclosure, is only for the purpose of explaining a particular embodiment and such terminology shall not be considered to limit the scope of the present disclosure. As used in the present disclosure, the forms “a”, “an”, and “the” may be intended to include the plural forms as well, unless the context clearly suggests otherwise. The terms, “comprises”, “comprising”, “including” and “having” are open-ended transitional phrases and therefore, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not forbid the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.

[0038] When an element is referred to as being “embodied thereon”, “engaged to”, “coupled to” or “communicatively coupled to” another element, it

may be directly on, engaged, connected or coupled to the other element. As used herein, the term “and/or” includes any and all combinations of one or more of the associated listed elements.

[0039] In the present era, it is found amidst a remarkable transformation driven by the proliferation of smart devices. These innovative technologies hold the promise of delivering unparalleled convenience, enhancing energy efficiency, and fostering a new era of interconnected living. From smartphones that serve as our personal assistants to smart thermostats that adapt to our preferences, these devices are shaping the way we interact with our surroundings. The seamless integration of these intelligent tools into our daily lives is redefining the concept of convenience, offering solutions that anticipate our needs and simplify our routines.

[0040] However, the existing landscape of smart technologies exhibits several limitations and challenges that hinder their widespread adoption and effectiveness. The prevailing smart energy meters, while providing valuable data on overall energy consumption, lack the ability to offer granular statistics analysis of individual appliances. These meters typically rely on an extensive array of voltage and current sensors, making them complex and costly to deploy. Many smart appliances on the market today suffer from limited interoperability.

[0041] To address these challenges, a metering device for automated analysis of electricity consumption by each appliance is disclosed in the present disclosure to enhance electricity consumption optimization by leveraging historical consumption data and insights.

[0042] To this, the present disclosure envisages a metering device 100 and method 600 for automated analysis of electricity consumption by each appliance 118 operated through a switchboard 200. The metering device 100 for automated analysis of electricity consumption by each appliance 118 operated through a switchboard 200 is described herein with reference to **Figures 1 to 4**, and a method 500 for automated analysis of electricity consumption by each appliance

118 operated through a switchboard 200 using the metering device 100 is described with reference to **Figure 5**.

[0043] **Figure 1** illustrates an architecture of a metering device for automated analysis of electricity consumption by each appliance 118 operated through a switchboard 200, in accordance with an embodiment of the present disclosure.

[0044] The metering device 100 comprises a power unit 102, a microcontroller 104, a relay module 106, a timer 108, a data storage device 112, and an evaluation unit 114.

[0045] In the metering device 100, the power unit 102 is configured to receive electricity from a power supply and store the electricity for operation of the metering device 100.

[0046] In an aspect, the power unit 102 is a rechargeable battery.

[0047] In an aspect, the rechargeable battery is connected to the power supply through a battery management system (BMS) 116.

[0048] The metering device 100 further comprises a microcontroller 104. The microcontroller 104 is configured to couple with the power unit 102 to receive the electricity and configured to receive an actuation signal from at least one switch of the switchboard 200 for supplying the electricity to an appliance 118 corresponding to the actuation signal.

[0049] In an aspect, the microcontroller 104 may be implemented as one or more microprocessors, microcomputers, microcontrollers, digital signal processors, central processing units, logic circuitries, and/or any devices that manipulate data based on operational instructions. Among other capabilities, the microcontroller 104 is configured to receive an actuation signal from the at least one switch of the switchboard 200 for automated analysis of electricity consumption. The microcontroller 104 may be implemented as a combination of hardware and programming (for example, programmable instructions) to implement one or more functionalities of the microprocessor. In the examples described herein, such combinations of hardware and programming may be

implemented in several different ways. For example, the programming for the microcontroller 104 may be processor-executable instructions stored on a non-transitory machine-readable storage medium and the hardware for the microcontroller 104 may include a processing resource (for example, one or more processors), to execute such instructions. In the present examples, the machine-readable storage medium may store instructions that, when executed by the processing resource, implement the one or more control instructions from the transceiver unit. In such examples, the microcontroller 104 may include the machine-readable storage medium storing the instructions and the processing resource to execute the instructions, or the machine-readable storage medium may be separate but accessible to the metering device 100 and the processing resource. In other examples, the microcontroller 104 may be implemented by electronic circuitry or a printed circuit board.

[0050] In an aspect, the microcontroller 104 is ESP8266.

[0051] In an aspect, the microcontroller 104 has a communication module. The communication module is configured to communicate with a communications router, for transmission of the calculated run time and power rating to the central server through the communication network.

[0052] In an aspect, the communication module is configured to communicate with the communications router, over a short range connection.

[0053] In an aspect, the short range connection includes a WiFi connection.

[0054] In an aspect, the microcontroller 104 is operable on an over-the-air (OTA) technology to receive firmware updates over a wireless connection.

[0055] The relay module 106 is configured to cooperate with the microcontroller 104 to supply the electricity to the appliance 118 corresponding to the actuation signal.

[0056] The timer 108 is configured to cooperate with the relay module 106 to calculate a run time and power rating of the appliance 118, and is further configured to transmit the calculated run time and power rating to the

microcontroller 104 for further transmission to a central server 110 through a communication network.

[0057] The data storage device 112 is configured to cooperate with the central server 110 to store the power rating and the run time of the appliance 118.

[0058] The evaluation unit 114 is configured to cooperate with the data storage device 112 to receive the power rating and the run time of the appliance to calculate energy consumption by the appliance 118.

[0059] **Figure 2** illustrates architecture of a test circuit Pin diagram of the metering device for automated analysis of electricity consumption, with reference to **Figure 1**.

[0060] **Figure 3** illustrates an exemplary view of a mobile dashboard, in accordance with an embodiment of the present disclosure.

[0061] In an aspect, the central server is implemented as a web platform providing a user interface for a mobile application 300 and a web application 400.

[0062] **Figure 4** illustrates an exemplary visualisation of a test setup, in accordance with an embodiment of the present disclosure. In an aspect, the Data is captured from the microcontroller 104 and transferred to the web application 400 and the mobile application 300 using the Blynk Server. A chart is also made plotting with the addition of all Units (KW) for energy consumption and the addition of all amounts for energy consumption by each appliance 118.

[0063] The present disclosure further describes a method 500 for automated analysis of electricity consumption by each appliance 118 operated through a switchboard 200 and is described with reference to **Figure 5**. The order in which the method 500 is described is not intended to be construed as a limitation, and any number of the described method steps can be combined in any appropriate order to carry out the method 500 or an alternative method. Additionally, individual steps may be deleted from the method 500 without departing from the scope of the subject matter described herein. The method 500 for automated analysis of electricity consumption by each appliance 118 operated through a

switchboard 200 is executed by a metering device 100. The method 700 includes the following steps:

[0064] In method step 502, the method 500 comprises receiving502, by a power unit 102, electricity from a power supply and storing the electricity for the operation of the metering device 100.

[0065] In method step 504, the method 500 comprises receiving504, by a microcontroller 104 coupled with the power unit 102, the electricity from the power unit 102 and an actuation signal from at least one switch of the switchboard 200 for supplying the electricity to an appliance 118 corresponding to the actuation signal.

[0066] In method step 506, the method 500 comprises supplying506, by a relay module 106, the electricity to the appliance 118 corresponding to the actuation signal.

[0067] In method step 508, the method 500 comprises calculating508, by a timer embedded with the relay module 106, a run time and power rating of the appliance.

[0068] In method step 510, the method 500 comprises transmitting510, by the timer 108 embedded with the relay module 106, the calculated run time and power rating to the microcontroller 104 for further transmission to a central server 110 through a communication network.

[0069] In method step 512, the method 500 comprises storing512, by a data storage device 112, the power rating and the run time of the appliance 118.

[0070] In method step 514, the method 500 comprises calculating514, by an evaluation unit 114, the energy consumption by the appliance 118.

[0071] An exemplary table for documenting the experimental data and experimental calculation is described herein with reference to **Table 1**.

ITEMS	POWER (kW)	TIME (HRs)	ENERGY (kWh)
Light	0.24		
Tv	0.05		
Heater	2		

[0072] **Table 1** illustrates an exemplary table for documenting the experimental data and experimental calculation, in accordance with an embodiment of the present disclosure.

[0073] The metering device 100 for automated analysis of electricity consumption invention is an automated electricity consumption analysis device with IoT features using timers, primarily implemented in the form of a switchboard. Its main aim is to transform traditional switchpanels into electronic switchboards or true smart switchboards. This hardware system can analyze individual appliances 118 connected to existing home or commercial switchboards using timers, requiring minimal physical space for installation.

[0074] The foregoing description of the embodiments has been provided for purposes of illustration and is not intended to limit the scope of the present disclosure. Individual components of a particular embodiment are generally not limited to that particular embodiment but, are interchangeable. Such variations are not to be regarded as a departure from the present disclosure, and all such modifications are considered to be within the scope of the present disclosure.

TECHNICAL ADVANCEMENTS AND ECONOMIC SIGNIFICANCE

[0075] The present disclosure described herein above has several technical advantages including, but not limited to, a metering device 100 and method 500

for automated analysis of electricity consumption by each appliance operated through a switchboard 200, which:

- provides the user(s) with a metering device 100, that can provide an efficient means of analyzing the energy consumption of individual appliances within a home or a commercial building;
- provides the user(s) with a metering device 100 using timers and mathematical calculations, to enable users to gain valuable insights into the power usage of each device, thereby facilitating more informed decisions on energy management;
- provides the user(s) with a metering device 100, that fosters seamless connectivity between devices, regardless of their brand or manufacturer;
- provides the user(s) with a metering device 100, that can provide the duration of operation for each appliance;
- provides the user(s) with a metering device 100, that can provide real-time feedback to users;
- provides the user(s) with a metering device 100, that is cost-effective and user-friendly; and
- provides the user(s) with a metering device 100, that provides flexible billing for residents allowing them to pay for electricity based on their actual usage, promoting fairness and efficiency in billing.

[0076] The embodiments herein and the various features and advantageous details thereof are explained with reference to the non-limiting embodiments in the following description. Descriptions of well-known components and processing techniques are omitted so as to not unnecessarily obscure the embodiments herein. The examples used herein are intended merely to facilitate an understanding of ways in which the embodiments herein may be practiced and to further enable

those of skill in the art to practice the embodiments herein. Accordingly, the examples should not be construed as limiting the scope of the embodiments herein.

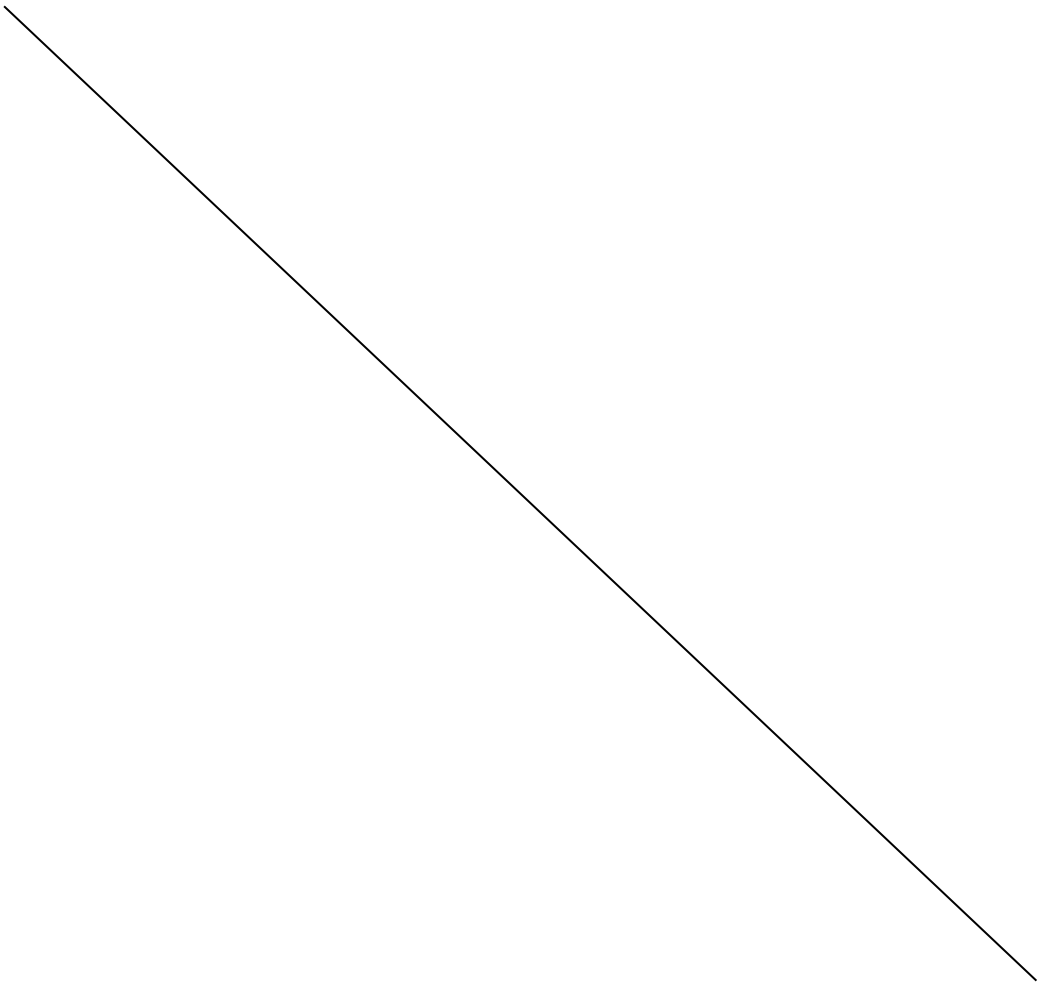
[0077] The foregoing description of the specific embodiments so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modification within the spirit and scope of the embodiments as described herein.

[0078] The use of the expression “at least” or “at least one” suggests the use of one or more elements or ingredients or quantities, as the use may be in the embodiment of the disclosure to achieve one or more of the desired objects or results.

[0079] Any discussion of documents, acts, materials, devices, articles or the like that has been included in this specification is solely for the purpose of providing a context for the disclosure. It is not to be taken as an admission that any or all of these matters form a part of the prior art base or were common general knowledge in the field relevant to the disclosure as it existed anywhere before the priority date of this application.

[0080] The numerical values mentioned for the various physical parameters, dimensions or quantities are only approximations and it is envisaged that the values higher/lower than the numerical values assigned to the parameters, dimensions or quantities fall within the scope of the disclosure, unless there is a statement in the specification specific to the contrary.

[0081] While considerable emphasis has been placed herein on the components and component parts of the preferred embodiments, it will be appreciated that many embodiments can be made and that many changes can be made in the preferred embodiments without departing from the principles of the disclosure. These and other changes in the preferred embodiment as well as other embodiments of the disclosure will be apparent to those skilled in the art from the disclosure herein, whereby it is to be distinctly understood that the foregoing descriptive matter is to be interpreted merely as illustrative of the disclosure and not as a limitation.



WE CLAIM:

1. A metering device (100) for automated analysis of electricity consumption by each appliance (118) operated through a switchboard (200), said device (100) comprising:

a power unit (102) configured to receive electricity from a power supply and store the electricity for operation of the metering device (100);

a microcontroller (104) configured to couple with the power unit (102) to receive the electricity and configured to receive an actuation signal from at least one switch of the switchboard (200) for supplying the electricity to an appliance (118) corresponding to the actuation signal;

a relay module (106) configured to cooperate with the microcontroller (104) to supply the electricity to the appliance (118) corresponding to the actuation signal;

a timer (108) configured to cooperate with the relay module (106) to calculate a run time and power rating of the appliance (118), and further configured to transmit the calculated run time and power rating to the microcontroller (104) for further transmission to a central server (110) through a communication network;

a data storage device (112) configured to cooperate with the central server (110) to store the power rating and the run time of the appliance (118); and

an evaluation unit (114) configured to cooperate with the data storage device (112) to receive the power rating and the run time of the appliance (118) to calculate energy consumption by the appliance (118).

2. The metering device (100) as claimed in claim 1, wherein the microcontroller (104) has a communication module configured to communicate with a communications router, for transmission of the calculated run time and power rating to the central server through the communication network.

3. The metering device (100) as claimed in claim 1, wherein the power unit (102) is a rechargeable battery.

4. The metering device (100) as claimed in claim 3, wherein the rechargeable battery is connected to the power supply through a battery management system (BMS) (116).

5. The metering device (100) as claimed in claim 1, wherein the central server is implemented as a web platform providing a user interface for a mobile application (300) and a web application (400).

6. The metering device (100) as claimed in claim 2, wherein the communication module is configured to communicate with the communications router, over a short range connection.

7. The metering device (100) as claimed in claim 6, wherein the short range connection includes a WiFi connection.

8. The metering device (100) as claimed in claim 1, wherein the metering device (100) is a Blynk Internet of Things (IoT) device.

9. The metering device (100) as claimed in claim 1, wherein the microcontroller (104) is operable on an over the air (OTA) technology to receive firmware updates over a wireless connection.

10. A method (500) for automated analysis of electricity consumption by each appliance (118) operated through a switchboard (200), wherein the method comprises:

receiving (502), by a power unit (102), electricity from a power supply and store the electricity for operation of the metering device (100);

receiving (504), by a microcontroller (104) coupled with the power unit (102), the electricity from the power unit (102) and an actuation signal from at least one switch of the switchboard (200) for supplying the electricity to an appliance (118) corresponding to the actuation signal;

supplying (506), by a relay module (106), the electricity to the appliance (118) corresponding to the actuation signal;

calculating (508), by a timer embedded with the relay module (106), a run time and power rating of the appliance (118);

transmitting (510), by the timer (108) embedded with the relay module (106), the calculated run time and power rating to the microcontroller (104) for further transmission to a central server (110) through a communication network.

storing (512), by a data storage device (112), the power rating and the run time of the appliance (118); and

calculating (514), by an evaluation unit (114), the energy consumption by the appliance (118).

Dated this 09th day of February, 2024

MOHAN RAJKUMAR DEWAN, IN/PA – 25
of R.K.DEWAN & CO.
Authorized Agent of Applicant

TO,
THE CONTROLLER OF PATENTS
THE PATENT OFFICE, AT CHENNAI

ABSTRACT

A METERING DEVICE AND A METHOD FOR AUTOMATED ANALYSIS OF ELECTRICITY CONSUMPTION BY EACH APPLIANCE

The present disclosure envisages a metering device (100) for automated analysis of electricity consumption by each appliance(118) operated through a switchboard (200). The metering device (100) comprises a power unit (102), a microcontroller (104), a relay module (106), a timer (108), a data storage device (112), and an evaluation unit (114). The power unit (102) receive electricity from a power supply and store the electricity for operation of the metering device (100). The microcontroller (104) receives an actuation signal from at least one switch of the switchboard (200) for supplying the electricity to an appliance(118) corresponding to the actuation signal. The relay module (106) supplies the electricity to the appliance(118). The timer (108) calculates a run time and power rating of the appliance(118), and transmits the calculated run time and power rating to the microcontroller (104) for further transmission to a central server (110) through a communication network. The evaluation unit (114) calculates the energy consumption by the appliance(118).

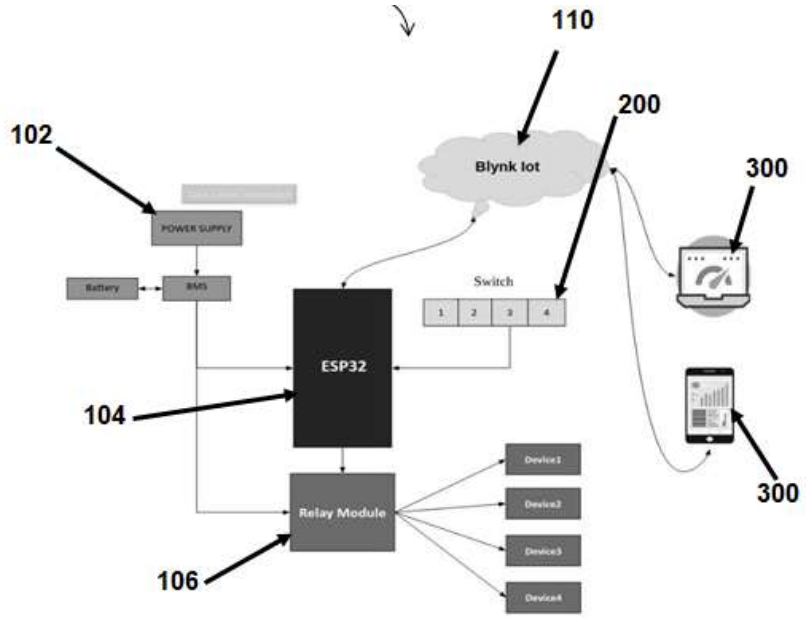


FIGURE 1