Spread Spectrum Modulation for Multi-Input DC-DC Converter

Tamilarasu Viswanathan, S Suryaprakash, P Abinesh

Abstract: This project develops spread spectrum modulation for multi-input buck DC-DC converter, with a low number of components. At the same time, independent power transfer capability is provided for input sources. With the use of a battery without any additional switches the power flow capability has been provided. It is best suited for hybrid energy systems or hybrid electric vehicle / electric vehicle applications. Various functional methods of the proposed topology were provided. Subsequently, a common relationship proposed to be proposed to calculate the critical stimulus calculation of the proposed n-input pug topology. Furthermore, a simple proportional control output is used to regulate the voltage and assign a portion of the power to supply each internal source. The tentry edition was modeled on modeling and simulation modeling in the proteus software to ensure the authenticity of the proposed topology and theoretical concepts.

Key Words: Spread Spectrum Modulation,DC-DC converter,Random Pulse width,Renewable applications

I. INTRODUCTION

As the consumption of fossil fuels increases, this does not only promote non-renewable energy, but also threatens human and environmental health. Renewable energies (solar, wind, water and other) are very reliable, flexible, vast and almost null emissions. These amazing features have been introduced by alternative promises for fossil fuels. Recently, the Tamil Nadu government has announced a subsidy of 90 percent subsidy to farmers in Tamil Nadu. The state government will provide 1,000 solar power irrigation pump sets at 5, 7.5 and 10 HP under Sample Scheme for farmers throughout the State. The use of solar based irrigation will increase in the coming years. Decisions on improving infrastructure, improving infrastructure (installing power stations, sub-stations, transmission and distribution systems). Power supply is not irregular and not satisfactory, but more fees are announced. As a result, they are energy-efficient by smart applications and their rankings that have promoted better energy security. For many input DC-DC Converter enabled Spread Spectrum modulation for the first time.

D.C. Surface control of closed ring using motor space spectrum modulation technique. Generate a universal block to extend power to other loads. The main disadvantage of these energies is to reduce sustainable capital expenditure and operating costs and toincrease the livelihood of agricultural equipment effectively.

They are intermittent nature, which can be resolved through hyperactive energy systems (HESs). Many input (MI) DCDC converters can act as HES. EmaiThe two main groups in the DCDC are presented in the literature: isolated and isolated varieties. A galvanic loneliness is provided between the previous type, inputs and output. This review focuses on non-isolated category only. Topology has a negative reference output. A single-inductor physiological MI converter is powered by pp, loading, or paclop modes, with minimum components used.

II. MODELLINGAPPORACH AND PROBLEM STATEMENT

A novel low-hormonix low-noise modulation program for switched-tied DCDC converters. A random modulation scheme of the proposed project is a combination of randomly closed-around pulse level modulation scheme (RWAPPM), and a noisy-motion lining. RWAPPM reduces switch-frequency synchronization at input current, but noise-flat reduces low-frequency noise. We get an analysis of the input current for the hybrid program's input current. We specify a hybrid plan against the regular Pulse Width Modulation Project (PWM) and RWAPPM noise-strain. With a minimum of 18.1 dB than the PWM of the current spectrum of the current current spectrum of the hybrid project, with a 3-V input voltage, 100-kH average switch frequency and noise-tray in the second line, Other random and spread-spectrum modulating schemes are generally more unpleasant than PWM, most of the input noise. However, the input noise is 73-mA rms (integrated over 200-kHz frequency without an input filter), the current of the proposed hybrid scheme compared to PWM, and the RWAPPM's lack of 16-mA rms. We also note a hybrid scheme against other well known random and wide spectrum modulation schemes. We still proposea novel pulse generator system that includes a hybrid program. We feel a dcdc variant that uses the beat generator, and check the techniques and properties of the hybrid program using the coverer. Output voltage We measure the functional limit of the spectrum, intermediate-response and switcher.

Revised Manuscript Received on December 28, 2018.

Tamilarasu Viswanathan, Assistant Professor, Kumaraguru College of Technology Coimbatore, Tamil Nadu, India

S Suryaprakash, Assistant Professor, Kumaraguru College of Technology Coimbatore, Tamil Nadu, India

P Abinesh, UG Scholar Electrical and Electronics Engineering, Kumaraguru College of Technology Coimbatore, Tamil Nadu, India

III. PROPOSED METHODOLOGY
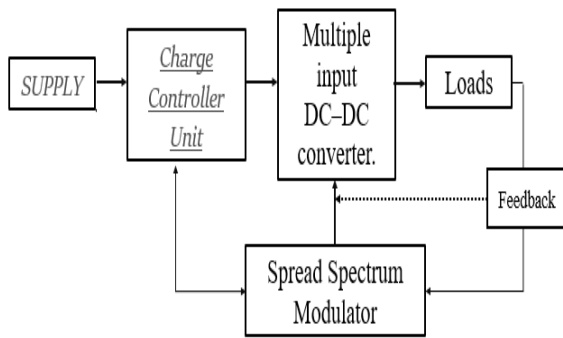
The overall blockdiagram show in Fig.1.

Fig. 1.Block diagram of Proposed Schem

A.Hybrid Energy Sources

PV Panels, Wind Energy Systems, Uninterrupted power supply (UPS) including batteries are consider as source of agriculture system. In this project, the batteries consider as input sources in primary stages for verifying the complete working logic. At final stage, it extended for different rated PV panels with batteries.

B.Control Unit

It controls two main process. 1. Act as charge controlling unit from the input side. 2. Performance Monitoring of converter input components.The process same as conventional charge controller but spread spectrum modulator governs the working of this unit.

C.Multi input DC-DC converter

Non-isolated type Multiple Input DC-DC converter used for power onversion in the entire scheme. Primary advantage of the scheme capable of operating in buck, boost or buckboost modes which is required for effective power conversion.Addi- tionally, single-inductor bidirectional MI converter used with minimum number of components. It reduce the production cost drastically for developing a universal power module.

D.Spread spectrum modulator

This modulation technique used in switched mode DC-DC converters for render strong harmonics at multiples of the switching-frequency in the input current and the output voltage spectra. The harmonics at the input current can cause conducted (EMI) noise and affect the other electronic circuit components. It is unacceptable because of reducing the life- time and interference on the circuit. Low cost inverter used also controlled spread spectrum modulation technique control only on AC load Variation.

E. DC Loads

For other process in agriculture, including lighting and battery as primary source with charging unit is connected.DC Loads LED Lighting & Charging of Battery for other applications.

F. Controller Description

Controller is one of the main components of the dental-input DCDC converters. In this study, the simplest, popular and well-equipped PI controller was used to regulate the output voltage and to clarify the portion of the power to be provided by each input source. The output voltage is compared to its reference value (VO ref) and the difference is provided by the PI controller inductor present value of average production. Then, the IL refractor's current average comparison and difference are given to a PI controller, T1, T2 and S1 switches create total duty cycle. The power management control (PMC) will decide the duty cycle of each switch. Depending on the type of input sources, different PMCs are designed. In this study, the simplest priority strategy is used as an example of PMC designing, in which Vbat V2 and V1 are prior to Vbat, before Vbat and V2. That is why the energy for long periods of time (when each varies) is 0 more than V1 Vbat and V2. BMC (discharging mode) is known by the equations provided. D1, d2 and d3 can be easily detected. Therefore, the obligation of T1, T2 and S1 switches is calculated as rotation from dS1 = d1, dT1 = (d3 d1) and dT2 = (d3 d2). Finally, the cycle of cycles is compared with the triangle waveform to create ankle pulses of switches compared to the cycles of cycles of cycles of cycles of cycles.

IV. RESULTS

The various functions allow you to built on our previous work and on the work of others rather than starting over and over again to perform the related tasks . any native MATLAB command or function may be used in your user defined function. Procedures can refer to any global variable. DC-DC converters are connected between the input system and the load as power conditioning unit to regulate the power to the output unit. DC-DC converter is simulated with the constant DC input and voltage variations at the input side. Boost converter Controlled by the Arduino Unit ATMega 328 is simulated under the closed loop

This output which actually shows the random variation of the MOSFET firing pulse which controls the variation in the output voltage given to the motor load. Thus using this pulse the motor is varied with the continuous pulse variation with more effectiveness and efficiency.
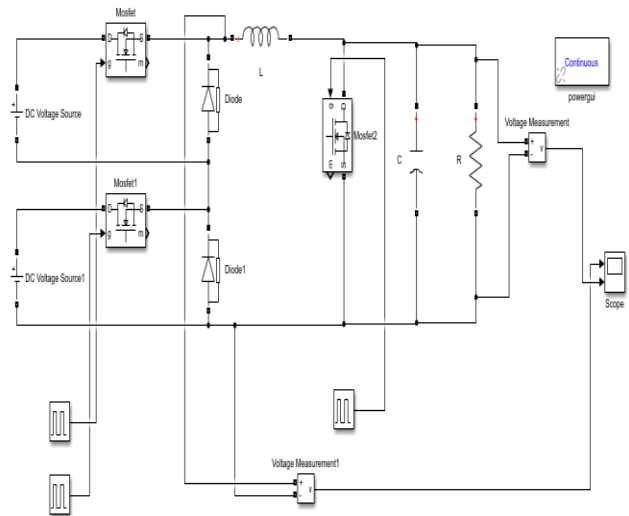

Fig.2. Simulation Model

V. CONCLUSION

A power module for Hybrid Energy Systems (HESs) has been obtained. In this project, the batteries consider as input sources in primary stages for verifying the complete working logic. At final stage, it extended for different rated PV panels with batteries.

REFERENCES

1. K. Premalatha and P. Thirumoorthi, "Fuzzy Logic Based Direct Torque Control of Three Phase Induction Motor". IJPAM 116.11 (2017): 171- 179.
2. K. Cui; V. Adrian; B. H. Gwee; J. S. Chang, "A Noise-Shaped Randomized Modulation for Switched-Mode DC-DC Converters," in IEEETransactions on Circuits and Systems I: Regular Papers , vol.PP, no.99, pp.1-12.
3. R Kavitha and Rani Thottungal, "Design and Stability Analysis of Buck- Boost Converter for Harnessing Energy From Bicycle Pedaling." IJPAM 116.11 (2017): 161-169.
4. P. Keerthana, B.G. Geetha, 3 P. Kanmani," Crustose Using Shape Features And Color Histogram With KnearestNeighbour Classifiers", International Journal Of Innovations In Scientific And Engineering Research, Vol. 4, Iss. 9,2017,Pp. 199-203.
5. K.Malarvizhi, R.Kiruba," A Novel Method Of Supervision And Control Of First Order Level Process Using Internet Of Things", Journal Of Advanced Research In Dynamical And Control Systems, Vol. 9, Sp– 6 , 2017, Pp. 1876-1894.
6. Latha.L, Suriya.P And Sindhuja.V.P," Automating The Irrigation System", International Journal Of Pure And Applied Mathematics, Vol.116, No. 11,2017, Pp. 211-219.