Microgrid No Voltage Sensor

Can LVDC microgrid control a sensor fault?
In the situation of sensor faults,it may not be possiblefor the controller to ensure proper control. The performance of the LVDC Microgrid in terms of the voltage regulation and proper power balance is mainly influenced by the effectiveness of the control strategy employed.

Why is voltage control important in LVDC microgrid?
Being driven by intermittent renewable sources and dynamic loading,the voltage control is quite crucial and challenging to ensure a stable LVDC microgrid. Furthermore,delivering the control objectives becomes very difficult in the presence of sensor faults.

What is the proposed control scheme for LVDC microgrid?
The proposed control scheme consists of the aspects of fault detection and isolation(FDI),and control reconfiguration. The proposed control scheme achieved the voltage tracking objective of the LVDC microgrid even under the presence of a faulty DC bus voltage sensor.

Why do LVDC microgrids need a battery storage system?
The standalone LVDC microgrids especially require the battery storage systems to maintain voltage stability and power balance of the microgrid. The voltage is maintained stable by appropriately controlling the charge/discharge of the battery corresponding to the dynamics of sources and loads [4,5].

Is LVDC microgrid tolerable?
This amount of deviation in voltage reference being tracked is not tolerablein LVDC microgrid. These controllers are well designed with the objective of effectively handling source and load dynamics in the system. In spite of being well designed,they tend to fail in handling the sensor fault situations.

What are the objectives of LVDC microgrid?
The system is designed to achieve the following objectives: 1. Maintain the node/bus voltage constant at a chosen reference of 48 V. 2. Maintain power balance in the system, i.e., total power generated should be equal to the total power consumed. The considered LVDC microgrid is a congregation of different subsystems and various components.

This article employs a fuzzy logic controller (FLC) to investigate voltage stability in a PV-based DC microgrid. Several photovoltaic (PV) modules, a DC-DC converter, and loads make up the microgrid.

This paper focuses on enhancing the resilience of microgrids--localized power systems that integrate multiple energy sources--against challenges such as natural disasters, technological ...

Standalone low-voltage DC (LVDC) microgrids have emerged as potential alternatives in the context of

effective rural electrification. The factors of reduction in conversion costs, paradigm shift in voltage levels of domestic loads made LVDC ... scheme for effectively handling the voltage sensor faults in LVDC microgrid. 2 ...

The term "microgrid" refers to the concept of a small number of DERs connected to a single power subsystem. DERs include both renewable and /or conventional resources [3]. The electric grid is no longer a one-way system from the 20th-century [4]. A constellation of distributed energy technologies is paving the way for MGs [5], [6], [7].

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This section describes the design technique for the CKF approach used to estimate the CPL"s unknown power. The CKF is exceptionally robust to unmodelled dynamics, system uncertainties, and noisy sensors [].Furthermore, this algorithm has a low computational cost, making it suitable for online estimation for DC microgrid states with a sizable number of ...

The application of advancements in cloud communications and embedded sensors can be used to augment the control of a residential microgrid through the real time data collection and control of both loads and generation resources. Advancements in sensor and metering technologies enable us to affordably collect more data than ever before and this data ...

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The parameters of the voltage sensing electrode plate are first optimized so that the sensed voltage tends to be consistent (smaller standard deviation), and then a series of the sensed measurement data containing errors are curve-fitted and the coefficients of each subterm of the polynomial curve are extracted, and the equation about the cable voltage is ...

2 ???· In this work, 48 V is taken as the DC microgrid voltage level, which is generally considered for DC systems along with other voltage levels such as 400, 325, 230, and 120 V. ...

Fault detection in a Direct Current (DC) microgrid with multiple interconnections of distributed generation units (DGUs) is an interesting topic of research. The occurrence of any sensor fault in the DC microgrid should be detected immediately by the fault detection network to achieve an overall stable performance of the system. This work focuses on sensor fault ...

fault tolerant control of the voltage source converter (VSC) coupled DERs in microgrid. Moreover, there is no studies to address the simultaneous sensor and actuator FTC. In addition, researchers and scientists from a wide range of disciplines are interested in studying FTC strategies for sensor and actuator faults [10], [11],

[13]-[15].

Voltage DC Microgrid M.V. Satya Sai Chandra and Sankarsan Mohapatro ... based control, in order to handle voltage sensor faults. The double modular hardware redundancy component is designed

DC microgrids are gaining more importance in maritime, aerospace, telecom, and isolated power plants for heightened reliability, efficiency, and control. Yet, designing a protective system for DC microgrids is challenging due to novelty and limited literature. Recent interest emphasizes standalone fault detection and classification, especially through data-driven ...

fault current direction (typically there is no voltage sensor in. a circuit breaker), the nuisance trip at main breaker and sym- ... AC/DC hybrid micro grid system (HMGS) is designed with ...

Control of AC/DC pulse-width modulation (PWM) power electronic converter, referred to as "AC/DC PWM converter", is vital to the efficient regulation of power flow between AC and DC parts of a hybrid microgrid. Given the importance of such converters in AC/DC microgrids, this paper investigates the design of fault-tolerant control for AC/DC PWM ...

The techniques comprising the CERTS microgrid concept are: 1) a method for effecting automatic and seamless transitions between grid-connected and islanded modes of operation, islanding the ...

This paper proposes a secondary control for a decentralized DC microgrid (DCMG) based on the DC-bus voltage (DCV) monitoring value not only to achieve power and voltage regulation but also to protect the system under the DCV sensor faults. To enhance the reliability of the DCMG system, a voltage observer is implemented for each power agent to monitor the voltage sensor ...

Distributed resilient adaptive control of islanded microgrids under sensor/actuator faults. NM Dehkordi, SZ Moussavi. IEEE Transactions on Smart Grid 11 (3), 2699-2708, 2019. 71: 2019: ... International Journal of Electrical Power & Energy Systems 143, 108506, 2022. 23: 2022:

In order to improve robust operating performance and enhance bus voltage stability, a learning observer-based fault-tolerant control strategy is proposed for the distributed generation in islanded microgrid with sensor faults and uncertain disturbances. Firstly, the output feedback control theory and the linear matrix inequality method are used to design closed-loop ...

The distributed AC microgrid (MG) voltage restoration problem has been extensively studied. Still, many existing secondary voltage control strategies neglect the co-regulation of the voltage at the point of common coupling (PCC) in the AC multi-MG system (MMS). When an MMS consists of sub-MGs connected in series, power flow between the sub-MGs is not possible if the PCC ...

Microgrids are low-voltage (LV) networks or distributed energy systems which provide heat and power to a

particular area by employing generators and loads. They have the ability to operate independently and isolate themselves from the main grid in ...

Power electronic interfaces acts as an interconnection between DC and AC micro-grid. The output from the PV is fed to the boost converter which boosts the output and it feds it to the DC micro-grid. The solar PV unit is the micro-grid"s power source, while the boost converter boosts the voltage produced.

System stability deterioration in microgrids commonly occurs due to unpredictable faults and equipment malfunctions. Recently, robust control techniques have been used in microgrid systems to address these difficulties. ...

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