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HMI for PV inverter and Energy Storage system

Description

This reference design is a HMI (Human Machine Interface) solution to interface with Energy Storage Equipment (Like PV system with inverter / MPPT and CLLLC battery charger) through CAN bus. This HMI reference solution is composed of 5 buttons, LCD display and RTC feature. Apart from CAN-FD interface, it can also provide Ethernet, WIFI & BT and RS485 to connect to external device

Advantages: Generic HMI solution with PV energy storage application protocol with cloud dashboard and it can also support several external interfaces included CAN-FD, RS485, Ethernet and WIFI/BT.

Features

- Interface with PV energy storage Inverter / MPPT / battery system through CAN-FD
- Ethernet access to Cloud server with PV application Dashboard.
- 5 buttons Human interface with dot matrix LCD panel display for PV application UI.
- 2 channels of RS485 interface for external device connection options.

Core Chip

1. MCU control: STM STM32F429VET6_1
2. Power Devices: ONSEMI CS51414, LM1117
3. Ethernet PHY: Microchip LAN8742A / Dapu DAP8201M
4. CAN-FD transceiver: ONSEMI NCB7357D1
5. RS485 transceiver: STM ST1480ABDR
6. WIFI and BLE module: Murata LBE5KL1DX
7. TVS: EPCOS TG30-A90XSMD, EZ0-A90XSMD, Littelfuse: SM24CANA-02HTG, SP712-02HTG, SP0504BAHT
8. SuperCap: KEMET FT0H105ZF

Applications

- HMI for Energy storage system.
- HMI for other applications.

Block Diagram