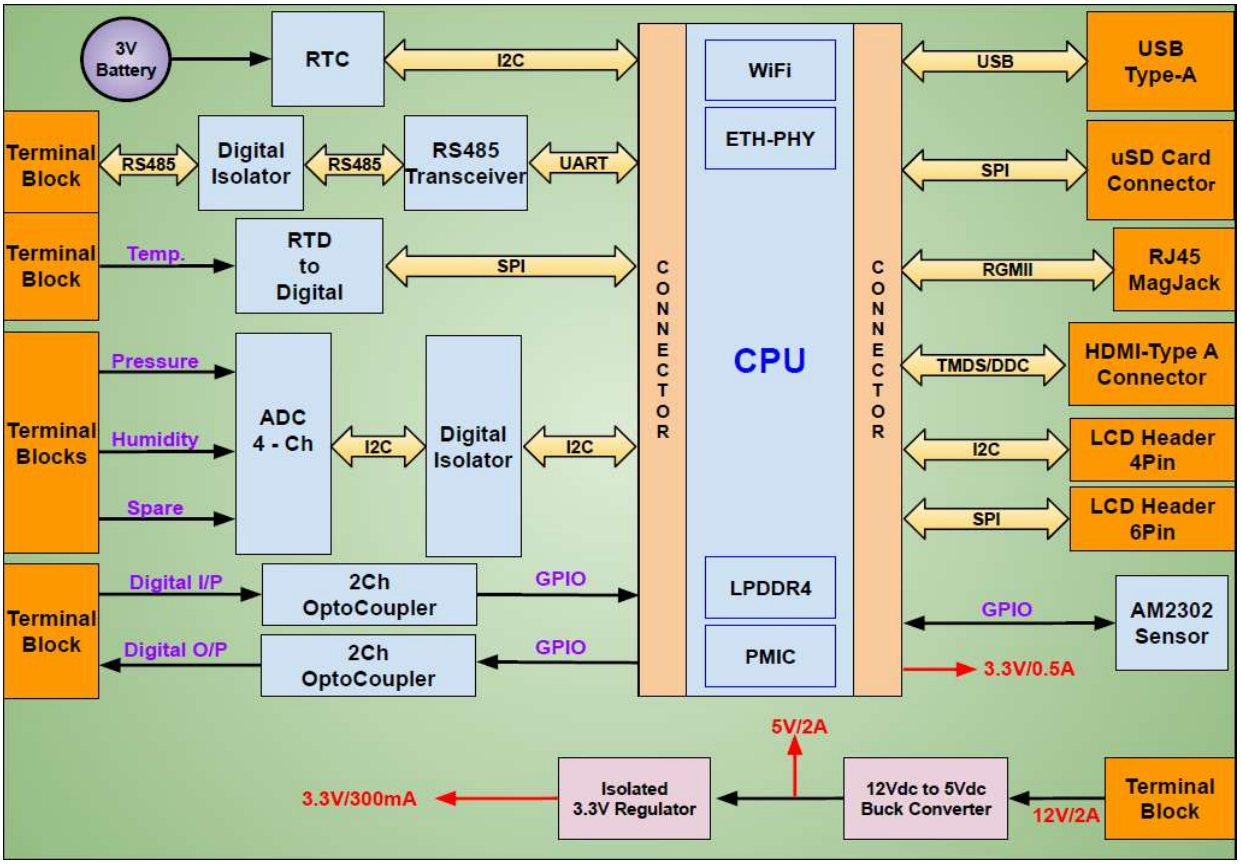
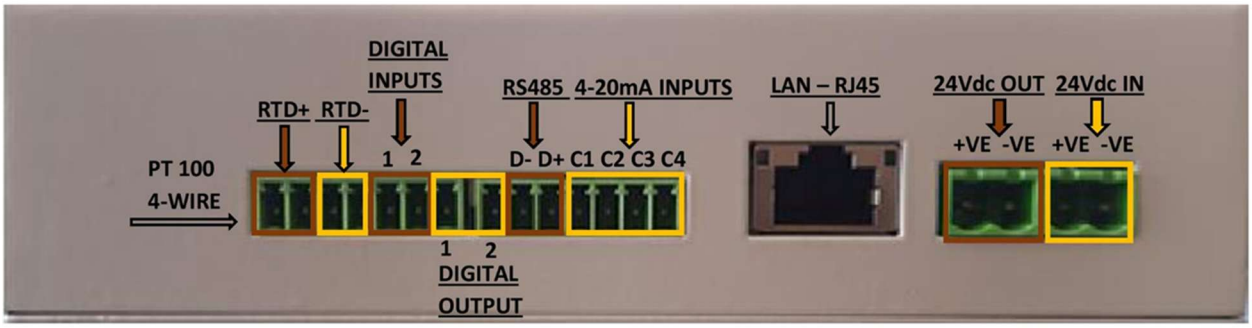
Smart Multi Channel Data logger– A case study

Data loggers allow users to capture various types of information about a specific environment or process, often gathered remotely over an extended period of time. Dedicated data recording devices are most often used in applications where critical measurements need to be taken regularly and consistently. The digitally stored data can then be actively monitored, documented and analyzed.

Aashaya Group of Companies has designed an IoT based digital data logger which can capture data on its digital channels and can send the data over the Wi-Fi or Ethernet to the designated server and the data can be downloaded in the CSV format for later analysis and use. A representative block diagram of this data logger is as shown below:



In our design system consists of a CM4 CPU running at 2.6Ghz, with 4GB LPDDR4 RAM, 32GB eMMC, 32GB SD card with built-in Gigabit ethernet, WiFi, RTC and digital/analog IO ports (4/8). The System is running on the latest version of Linux OS.



The above display indicates the Humidity (Rh in %), Pressure (in bar) and Temperature in (degree C). Along with that it displays the IP address of the device connection, RTC (Time date), number of records being saved on the built in SD card (% full) as back up.

Following is the list of devices from which data is captured:

1. Four ADC ports that measure current. 4-20mA.
2. PT 100 temperature sensor, 4-wire/2-wire combination.
3. Internal humidity and temperature, AHT25.

4. Two digital input ports, 24V DC.
5. Two digital output ports, 24VDC.
6. RS485 meter data.

The digital output ports are to be controlled by the user via APIs or Modbus.

Following are the protocols from which data can be extracted from the device

1. MQTT, live data.
2. Modbus TCP/IP, live data.
3. SFTP, historical data.

Each captured data set along with events, is:

1. Stored in a CSV file in the internal storage.
2. Stored in a CSV file in the SD card.
3. Published to the default MQTT topic in JSON format.
4. Updated in the display.

Each of the captured set will also have the following:

1. Sl. No of the captured set, incrementing by one each time.
2. Device ID, set by the user.
3. Date and time at which the data was captured.

All the data stored in the SD card can be encrypted for secure data logging, using industry standard AES-128 encryption.

A system with various parameter capturing capabilities and set up is designed into this smart IoT Data Logger. Threshold values can be set and any violations will be flagged, will be indicated in the display.

All the parameters like logging interval, MODBUS parameters, MQTT addresses, static IP address, Wi-Fi settings, encryption keys, and so on can be configured via password protected web configurator.

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There are 3 options of the device available:

Basic: 4 Channel Data logger with LCD display

HDMI: 4 Channel Data Logger with HDMI Port

HDMI plus: 8 Channel Data Logger with HDMI port

For any further queries, please contact us at +91 99010-23235