IOT TRAINER

Note Shown image is just for illustration original may differ

Processor: Cortex-A53 (ARMv8) 64-bit SoC @ 1.4GHz,

Memory: 1GB RAM and 32GB SD Card external,

Operating System: Linux Based design, Operating System porting, C, C++ and python Programming, Qt IDE based GUI development, Communication Ethernet, 802.11 b/g wireless LAN (WiFi), Bluetooth, 3G, Rs485,

Display :H DM I Output,

USB: USB HID and CDC Interface,

LCD: on board 1.77" inch Color TFT,

ADC : on board 6 Nos., Voltage inputs, 1 Channel Resistance Input And 1 channel 4-20mA Input,

Onboard Motor driver : For stepper motor and DC motor ,

Onboard communication :I2C interface, SPI interface and RS485 interface ,

Onboard: 8 LED interface, 2 switch interface, Serial to USB converter, Connectors with external module interface ,

Other Modules: Relay, Buzzer, Bluetooth, Camera and RS485 Module.

Onboard Zigbee Coordinator: Zigbee device with USB Interface, Zigbee End/ Router (Node - 5Nos.): Each node is IP65 box with 6 Analog inputs, 4 digital outputs, I2C port input, inbuilt 3.7v/4400mA Battery, Solar Panel, USB and TTL interface, remote parameter update(OTA),

Cloud/ Server configurations: It has futures of local server configuration, database Management and web based application. Also Included learning of Html, jQuery, JavaScript and Php applications feature for local server.

Onboard loT gateway: 2G or 3G modem with USB interface and GPRS enabled. Modem is control via at Commands, also user can make voice call, SMS and send data through Embedded TCP/UDP and HTTP protocol for loT Gateway. Local cloud & server configuration Over the air (OTA) node configuration GUI based parameter configuration GUI Base loT application development.

Temperature Sensor

Linear Temp. Slope - 10mV/°C

Temp. Range (°C) - -40 to +150-4°C/+6°C

Accuracy from - -40°C to +150°C

Operates from - 2.3V to 5.5V

Humidity

Accuracy - ±3.0 %RH

Operates Voltage - 3.3V

Range - 0 to 100% RH

Output Signal- Analog voltage

Soil/Water temperature

Temp. Range (°C) - 0 to 100

Accuracy - ±2°C

Size - 6 inch

Output Voltage - 3.3 to 5V

Leaf Wetness

Grid-like,

Resistance-type sensor

Moisture on vegetation from 0 (dry) to 15 (wet).

Soil Moisture Sensor

Operates Voltage - 3.3 to 5V

Range - 0 to 100% (Need Calibration)

Output Signal - Analog Voltage

Dust Sensor

Operates Voltage - 5V

Sensitivity - 0.65 V/(0.1mg/m3)

Output Signal - Analog Voltage

Online Cloud/ Server (Optional): It will come with online server along with database, email, Configuration and one website for one year.

Wireless Sensor Node

Analog Inputs : 6 nos.

Digital Outputs : 4 nos.

I2C channel: 1 no.

Communication : Zigbee 2.4 Ghz

PC Interface : USB

Charging : USB and Solar Panel Battery : 3.7V/4400mAH

Solar Panel: 6W

Experiments:-

Introduction to Internet of Things (loT)

Definition of the Internet of Things (loT)

The Importance of the Internet of Things (loT)

loTArchitecture

History of loT, M2M and Web of Things

Overview of loT Builder Hardware platforms -The Layering concepts, loT Communication Pattern,

loT protocol Architecture, 6L0WPAN

Understand loT Market perspective in different segments.

Operating System used for loT

Linux Operating System introduction

Working with the command line and the Shell

Managing directories and files

Managing user access and security

Setting up a Linux file system

Connecting a system to the network

Shell Scripting Programming for loT

Introduction

Creating Shell Scripts

Flow control in the Shell

Advanced Shell features

Programming Language used in loT

C Programming

Python

Hardware Interfacing for loT

Sensors interfacing

Actuators interfacing

Communication Protocol study for loT

UART Communication

RS485 Communication

I2C and SPI Protocol device interfacing

Ethernet configuration

Zigbee interfacing

MQTT Protocol

Wi-Fi AP and Router interfacing

GSM module interfacing Database, Cloud Configuration for loT

Qt based GUI and C++ Programming for loT Web and Application Development Tools for loT Importance of Wireless Sensor Network (WSN) in loT Study of Zigbee router, end device and coordinator configuration