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IoT Data Acquisition System and Protocol Converters

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When talking about Internet of Things (IoT), Data acquisition (DAQ) and protocols are pivotal building blocks of IoT technology. A data acquisition device helps users to make machines smarter by gathering and analyzing real-time data. IoT protocols enable it to exchange data in an organized and significant manner. IoT protocols are languages that enable interaction between sensors, devices, gateways, servers, and user applications.

Scientech 6205DA IoT Data Acquisition System and Protocol Converters is a unique platform which allows users to explore architecture, working, and design applications of a data acquisition system and understand types of protocol converters like serial to Ethernet converter, serial to Wi-Fi converter, and serial to GPRS. This platform allows users to perform a wide range of experiments while learning intricate concepts in an interactive and simple manner.

Features

- DAQ with 4 analog inputs, 8 pulse inputs, 8 digital inputs and 4 relay outputs.
- Serial to Ethernet, serial to Wi-Fi and serial to GPRS protocol converter modules.
- Ethernet, Wi-Fi and GPRS modem.
- Push to on switches, visual indicators, audio indicator and variable DC supplies.
- Embedded web server and application software.
- Cloud connectivity for bidirectional control.
- Arduino compatible.
- User reconfigurable and re-programmable hardware.
- Study of sensor and actuator interfacing.
- Cloud & server configuration.
- IoT gateway using Wi-Fi and Ethernet.
- PC based data logging.
- User friendly, self explanatory system.
- Experiments configurable through patch board.
- Online product tutorial.

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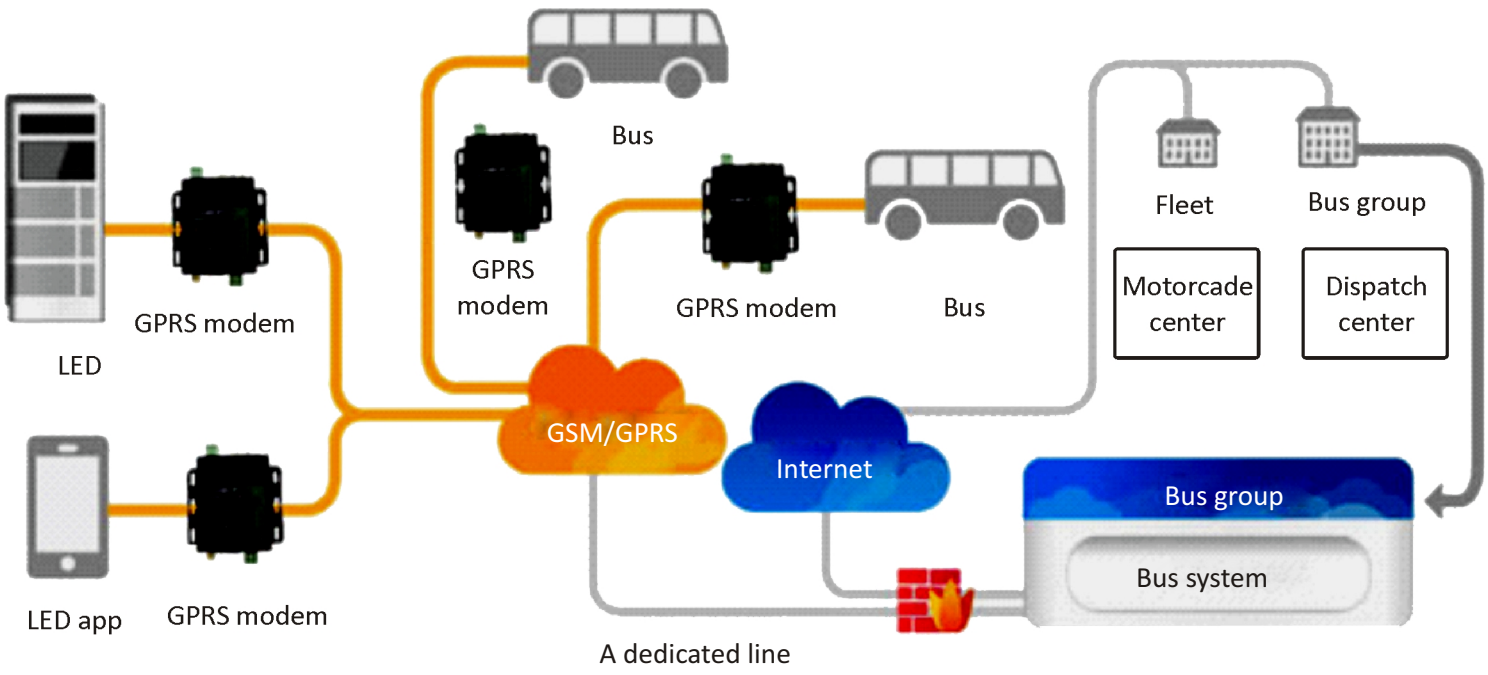
Scope of Learning

- Introduction to IoT protocols and converters.
- Data acquisition and its applications.
- Installation and operating of Arduino IDE.
- GPIO control using Arduino programming.
- UART, RS485, Ethernet, Wi-Fi AP/Router and GSM communication.
- Interface Ethernet modem with DAQ controller.
- Interface GSM modem with DAQ controller.
- Interface Wi-Fi modem with DAQ controller.
- Understand and use RS232 to RS485 converter.
- Understand and use RS232 to Wi-Fi converter for cloud connectivity.
- Understand and use RS232 to GPRS converter for cloud connectivity.
- Program to send data through RS232 and RS485.
- Explore AT commands to configure GSM and Wi-Fi modem.
- Study network protocols like TCP, UDP, HTTP and MQTT.
- Study SMS using AT commands.
- Understand database and cloud configuration for IoT.
- Design and develop edge and cloud computing applications.

Applications



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Technical Specifications

Data acquisition system (DAQ)

ADC resolution	: 10 bits
Digital inputs	: 8 nos.
Digital pulse inputs	: 8 nos.
Analog inputs	: 4 nos.
Digital outputs	: 4 nos. (relay output)
Flash memory	: 32KB
SRAM	: 2KB
Interface	: USB port

Modems:

Ethernet modem

- IEEE802.3af compliant
- Wiznet W5100 IC chip
- 10/100mb connection speed

Wi-Fi modem

- 802.11 b/g/n
- Wi-Fi direct (P2P), soft-AP
- Integrated TCP/IP protocol stack
- Integrated low power 32-bit CPU can be used as application processor
- Access point and station modes

GPRS modem

- Quad-band 850/900/1800/1900 MHz
- GPRS multi-slot class 10/8
- GPRS mobile station class B
- Compliant to GSM phase 2/2+
- Class 4 (2 W @850/ 900 MHz)
- Class 1 (1 W @ 1800/1900MHz)
- Control via AT commands

Protocol convertor:

Serial to Ethernet convertor

Processor	: TI cortex-M0
Ethernet port number	: 1
Serial port number	: 1
Interface standard	: RJ45
Rate	: 10/100 Mbps
Network protocol	: IP, TCP, UDP, DHCP, DNS, HTTP
Buffer send	: 6KB
Buffer receive	: 4KB
Interface standard	: RS232: DB9 female port

Socket transparent

Transmission	: Supports TCP server, TCP client, UDP server, UDP client
HTTP client	: Supports HTTP protocol transmission
Configuration method	: AT command, webpage configuration

Serial to Wi-Fi convertor

Wi-Fi standard	: 802.11 b/g/n
Serial interface	: RS232/RS485
Antenna interface	: External: SMA antenna
Wireless network	: AP, STA, AP+STA
Encryption type	: TKIP, AES , TKIP/AES
Network protocol	: IPV4, TCP/UDP

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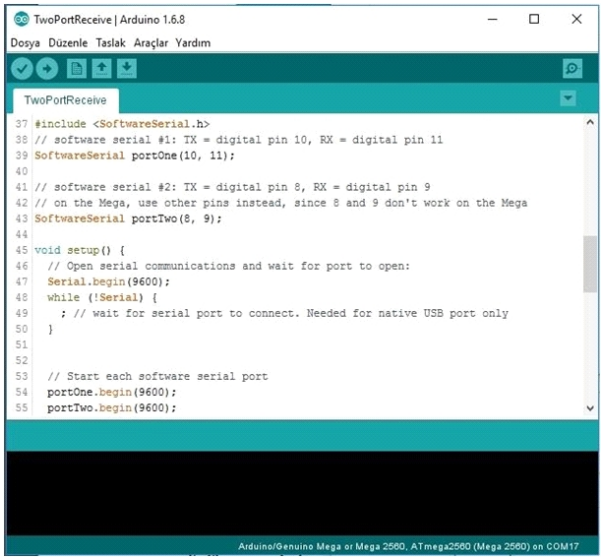
Serial to GPRS convertor

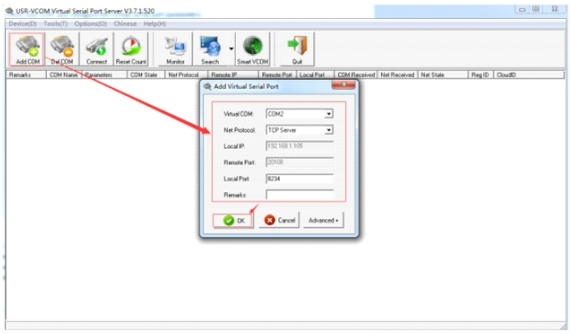
Network standard	: GSM / GPRS
Rate	: 14.4Kbps ~ 57.6Kbps
Standard frequency range	: 850/900/1800/1900MHz
GPRS multi-slot class GPRS	: Class 10
Network protocol	: TCP, UDP, DNS, HTTP
Serial port number	: 2 (1*RS232, 1*RS485, cannot work at the same time)
Interface standard	: RS232: DB9 cellular type, RS485: 2 wire (A+, B-)
Antenna interface	: 50Ω/SMA (female terminal)
SIM card supply	: 1.8V/3V
Configuration	: Using AT command

Note: SIM card will have internet data pack activated and will be provided by the user

Arduino IDE software



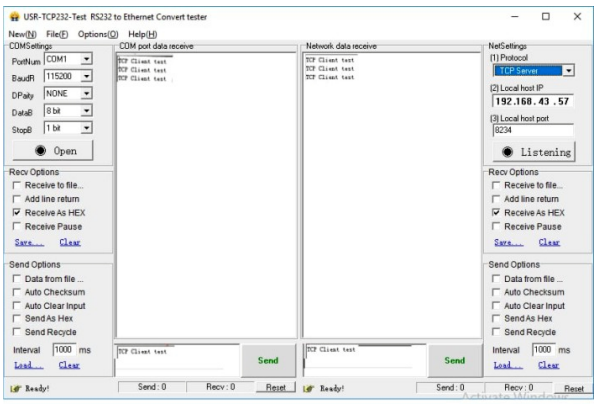
Software window of virtual serial port server



Package contains

		Quantity
• Ethernet cable	:	1
• RS232 cable male to female	:	1
• RS232 cable female to female	:	1
• 4mm patch cord (blue)	:	10
• 4mm patch cord (yellow)	:	10
• 4mm patch cord (red)	:	4
• 4mm patch cord (black)	:	4
• Mains cord	:	1
• USB cable (A to B)	:	1

RS232 to Ethernet convert tester software window



Subject to change Version 1.0

Designed and Manufactured in India by -

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