Wireless Supervision & Control

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Abstract-**SCADA is the acronym for "Supervisory Control And Data Acquisition." SCADA systems are widely used in industry for supervisory control and data acquisition of industrial processes. Conventional SCADA systems use PC, notebook, thin client, and PDA as a client. In this paper, a Android mobile phone has been used as a client in a sample SCADA application in order to display and supervise the position of a sample prototype crane. The paper presents an actual implementation of the on-line controlling of the prototype crane via mobile phone. The wireless communication between the mobile phone and the SCADA server is performed by means of a base station via Bluetooth wireless application protocol .**

Keywords: Android Application over Smart Phone, Remote monitoring system, SCADA, Bluetooth, Sensors, Microcontroller.

I. INTRODUCTION

Supervisory Control and Data Acquisition (SCADA) is a process control system that enables a site operator to monitor and control processes that are distributed among various remote sites. A properly designed SCADA system saves time and money by eliminating the need for service personnel to visit each site for inspection, data collection/logging or make adjustments. Supervisory Control and Data Acquisition systems are computers, controllers, instruments; actuators, networks, and interfaces that manage the control of automated industrial processes and allow analysis of those systems through data collection .They are used in all types of industries, from electrical distribution systems, to food processing, to facility security alarms.

Conventional SCADA system components are given in above data where all monitoring, processing, and control are constrained within the local area network located in the control center. Dedicated channels are required to guarantee the time responsiveness of the system. In earlier days, an alarm sounding at control room meant that a crew would be dispatched to the trouble site to assess the problem. Based on their assessment, other crews would be called in, and those crews often would discover that yet an additional work crew was needed. Insufficient data with

no control meant that all alarms were treated as urgent, since there was no knowledge about the importance of an alarm or the attention it required.

Supervisory control and data acquisition is used to describe a system where both data acquisition and supervisory control are performed. Mobile Supervisory Control and Data Acquisition (referred to as Mobile SCADA) is the use of SCADA with the mobile phone network being used as the underlying communication medium. Bluetooth is a wireless communication technology, most popular today for transmitting data anywhere in the near field with the help of mobile phones. Bluetooth is chosen as the specific mobile communication protocol to use as it provides an always on-line Inter connection without any time based charges.

A need has emerged to access system information instead of controlling it from specific control centers. SCADA systems have been opened to the world via Bluetooth to meet this requirement. Despite all these improvements, the SCADA system needs an Android Smartphone connected to Via Bluetooth. Recently there has been a growing trend towards Smartphone and work stations becoming "portable" and "mobile." This has led to a big expansion of wireless networking, which is getting advanced in terms of technology and usage and penetration. SCADA software usually exists in a computer, which carries out tasks of supervision and management of alarms, as well as data processing and process control. The communication is made by means of Bluetooth network. All these tools are executed normally in real time, and are designed to give the plant operator the possibility of supervising and controlling of these processes.

This paper discusses the use of mobile phone as a client for an industrial SCADA automation system. As distance to remote sites increases, therefore it becomes more difficult to access them hence, SCADA becomes a better alternative to an operator or repairman visiting the site for adjustments and inspections. Distance and remoteness are two major factors for using the SCADA systems.

II. SOFTWARE PLATFORM : ANDROID

Android SCADA is a SCADA for accessing production and process data through smart phones and other Android devices, using the industrial communication protocol – Bluetooth.

Nowadays, mobile devices are becoming more powerful and the communication infrastructure (Wi-Fi, 3G, 4G) is becoming more affordable. Now employees could receive technology information and have access to system controls anywhere at any time. Our idea is to do a quick

visualization between an Android device and remotely situated industrial devices such as flow meters, compressors, tanks, artificial lift devices and more. Android SCADA allows the monitoring and control of automated processes to be extended to an ordinary mobile device, smart phone or tablet PC without extra development environment. It takes only minutes to set it up if you're used to SCADA. Android SCADA based on the Bluetooth protocol. Bluetooth is one of the most widely used communications protocol in process industries today.

ANDROID- WORLD'S MOST POPULAR & FASTEST GROWING PLATFORM

Android powers hundreds of millions of mobile devices in more than 190 countries around the world. It's the largest installed base of any mobile platform and growing fast— every day another millions of users power up their Android devices for the first time and start looking for apps, games, and other digital content. Android gives you a world-class platform for creating apps and games for Android users everywhere, as well as an open marketplace for distributing to them instantly.
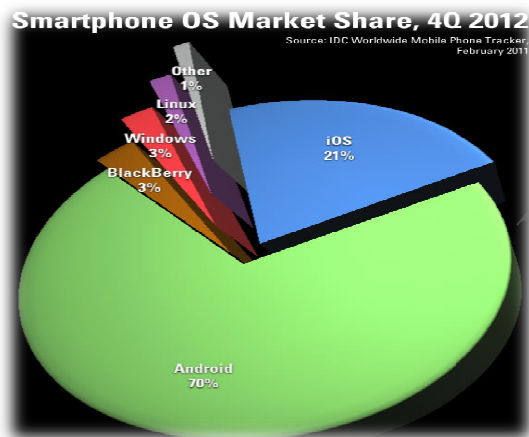

fig. 1: OS market share

With its partners, Android is continuously pushing the boundaries of hardware and software forward to bring new capabilities to users and developers. For developers, Android innovation lets you build powerful, differentiated applications that use the latest mobile technologies.

Android gives you everything you need to build best-in-class app experiences. It gives you a single application model that lets you deploy your apps broadly to hundreds of millions of users across a wide range of devices—from phones to tablets and beyond.

Android also gives you tools for creating apps that look great and take advantage of the hardware capabilities available on each device. It automatically adapts your UI to look it's best on each device, while giving you as much control as you want over your UI on different device types.

To help you develop efficiently, the Android Developer Tools offer a full Java IDE with advanced features for developing, debugging, and packaging Android apps. Using the IDE, you can develop on any available Android device or create virtual devices that emulate any hardware configuration.

MAIN FEATURES.

1. Very fast. Immediate connection and display.
2. Supports events.
3. Supports trends.
4. Projects can be configured directly from your Android device.
5. Configurable authorization.
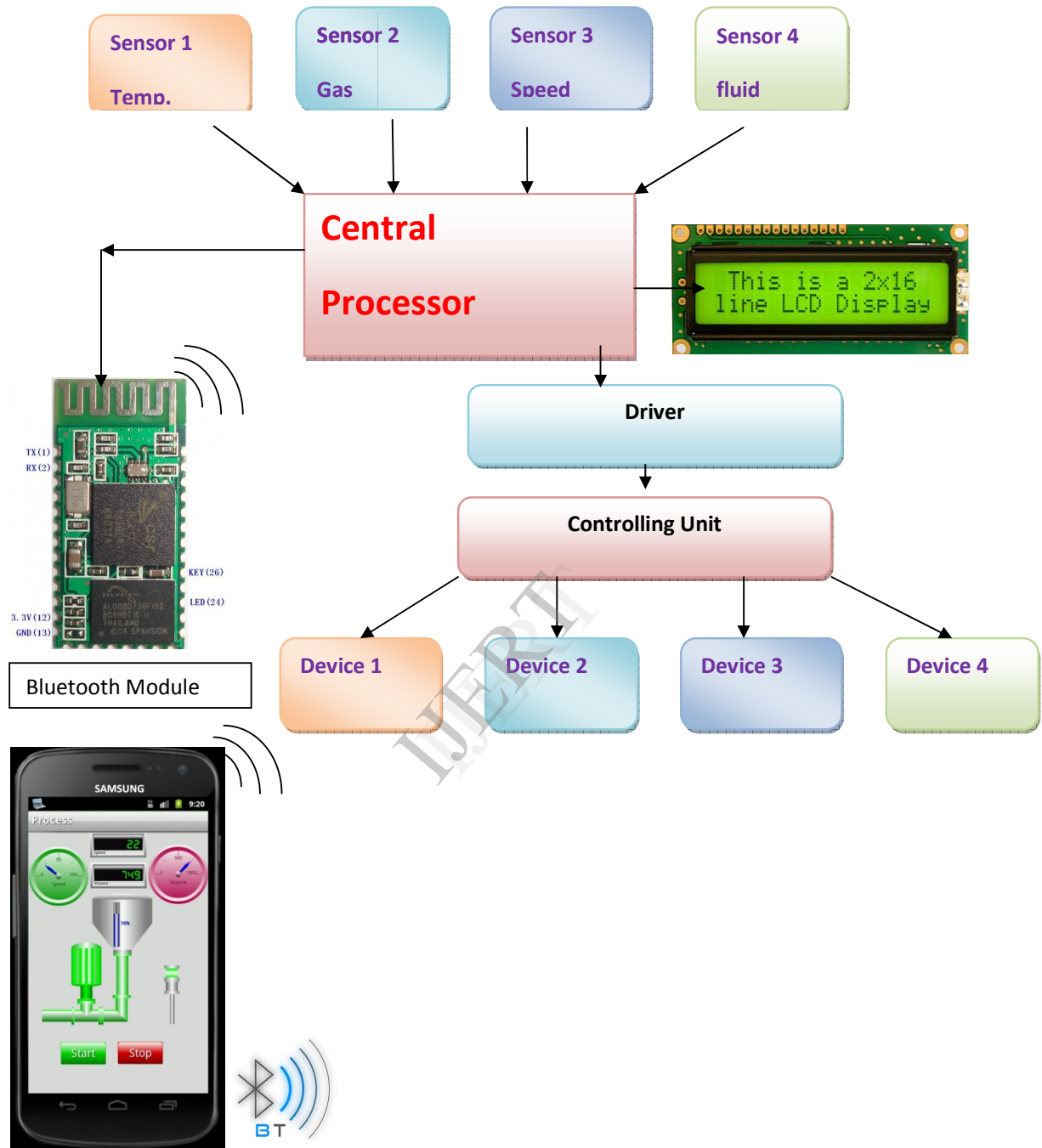
III.   BLOCK DIAGRAM :

Fig 2. Block Diagram

IV.   COMPONENTS OF THE SCADA SYSTEM

SCADA systems typically are made of four components:

Master Unit (Central processor)– This is heart of the system and is centrally located under the operator's control.

Remote Unit (Sensors) - This unit is installed from where the process is actually monitored. It gathers required data about the process and sends it to the master unit.

Communication Mode - This unit transmits signals/data between the master unit and the remote unit. Communication mode can be a cable, wireless Communication –Bluetooth etc.

Software - Android Application The software is an interface between the operator and the units. It allows the operator to visualize and control the functions of the process.

V. APPLICATIONS

1. Wireless Telemetry
2. Remote Data Logging
3. Robotics
4. Sensor Monitoring
5. Remote Programming

VI. FUTURE SCOPE

It is easier to take the right automation approach and choose the right equipment for the task considered. Mobile-based SCADA integration using the Bluetooth or Wi-Fi DATA transfer scheme could thus enhance the performance of the system in a day without causing an increase in the response times of SCADA functions. Distance between the remote site and the operator are increasing. Thus by implementing mobile based SCADA the functioning of the system can be done immediately.

VII. CONCLUSION

This project investigates on creating an extremely low cost device which can be adapted to many different SCADA applications via some very basic programming, and plugging in the relevant peripherals. Thus, wireless supervision and control can be used and implemented easily along with efficient functioning & increased productivity.

VIII. REFRENCES

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