



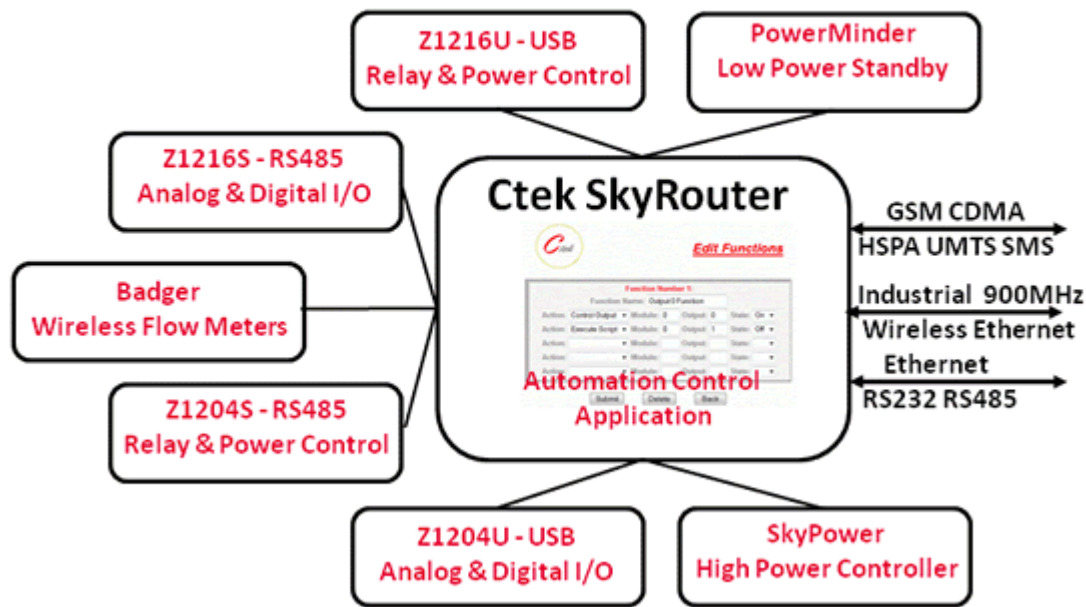
Things that move data

Ctek Wireless Automation Control Framework

Ctek's Automation Framework provides you with a totally new way to look at an old problem. Monitoring and controlling remote industrial installations is one of the most basic of all cellular applications. Until now that has usually meant integrating sensors, I/O modules, a PLC or RTU, a wireless device, and server based software, all from different vendors. Our answer is an advanced automation control application that resides on a rugged Ctek SkyRouter and is fully integrated with a growing selection of I/O modules and

communications capabilities including Industrial 900MHz point-to-point and multipoint networking. Distributed monitoring and control capabilities link installations at different physical sites into a common control network. Operation and management is enabled through an over-the-air browser interface that provides access to a user configurable dash board style control panel that monitors and controls the end-point application. Read on to learn how this new approach to an old problem can simplify and cost reduce your next installation.

Ctek Automation Framework



Benefits

- ◆ Optimized for cellular networks
- ◆ Eliminate PLC and server application
- ◆ Anywhere/anytime access and control
- ◆ Network architecture easily extended
- ◆ Remote alarms and notification
- ◆ Reports in spread sheet format
- ◆ Available as a private label product
- ◆ Easily customized for your application

Features

- ◆ Application installs on any SkyRouter
- ◆ Available for GSM, UMTS, and CDMA
- ◆ Integrated I/O modules
- ◆ Optional 900 MHz networking
- ◆ Analog, digital, and pulse inputs
- ◆ Digital and high power outputs
- ◆ User defined dashboard
- ◆ Optional NEMA 4X packaging



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Automation Control Application

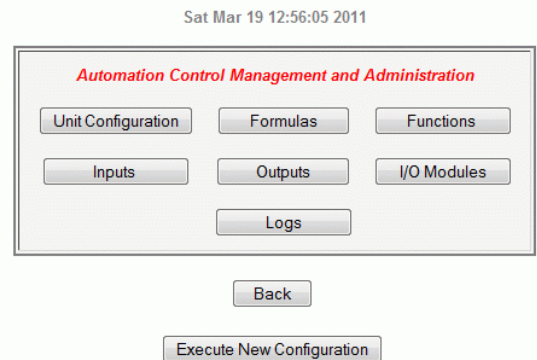
Ctek's Automation Control Application combines the physical characteristics of a premium RTU, the control logic of a PLC and the communications capabilities of Ctek's SkyRouter to create a Wireless Application Controller that is optimized for cellular and 900MHz industrial communications.

Unlike conventional server based systems Ctek's Automation Control Application resides entirely at the wireless endpoint. Input values are displayed and output controls are initiated on user defined web screens. User assigned alarm and alert messages are directed to one or more remote terminals and reports are emailed on an assigned schedule. Rather than sending endless "I'm OK" messages to your server this wireless optimized application alerts the exceptions and provides browser access for the day-to-day status. And all of this means that your automation control application can run on an extremely low cost wireless telemetry data plan while providing you the management information and control you need.

On the physical side the intuitive web based application allows users to install and configure analog, digital and pulse inputs and digital outputs.



Automation Control Application

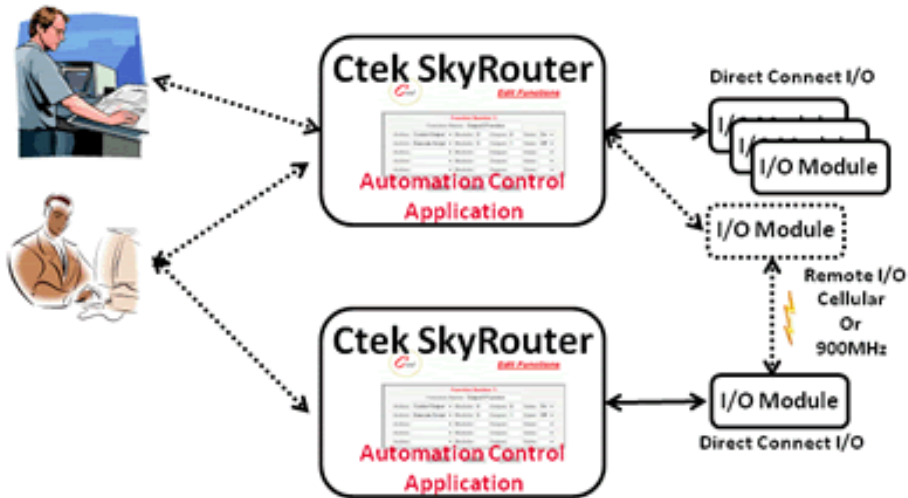


In the case of analog and pulse inputs all the necessary scaling and trimming variables are defined to convert raw sensor inputs to engineering units for the value being measured.

Control logic is provided by user defined formulas that can be applied to sensor input values and by functions that are activated by user established thresholds that can be used to operate outputs.

Threshold values can also be used to create log file entries and send alerts to remote user terminals. Log files may be emailed to selected users in a comma separated (CSV) format that can be read with most spread sheet applications and easily imported into a database.

Networks of automation control endpoints are easily created by defining remote instances of a particular I/O.



Using this feature an output at one remote site can appear as a remote instance at another site where it will be activated by functions assigned to local sensors. As an example, a pump control at site A might appear as a remote instance at site B where tank levels are being monitored. Based on tank level threshold settings the distant pump would be turned on and off to keep the monitored tank full within a prescribed range. The remote I/o instance feature is one example of how Ctek's Automation Control application is optimized to use wireless networks efficiently and effectively.

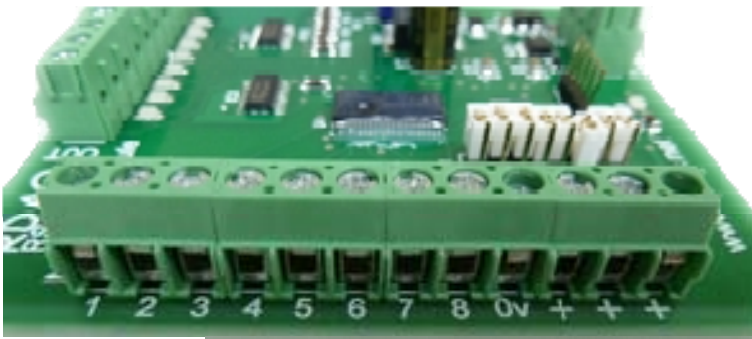


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Ctek Wireless Automation Control Framework

I/O Modules

Monitor and react. Beyond a doubt sensors and power control are the essence of Machine-To-Machine communications. Ctek's I/O modules are tightly integrated with the SkyRouter and NetServer Automation Control application and scaled for real world endpoint requirements providing the flexibility required to serve a wide range of analog and digital input requirements, and industrial rated output control to manage everything from indicator lamps to motor start/stop operations, all under the precise control of the SkyRouter cellular application platform. Ctek I/O modules are available with two different interface options, RS485 or USB. USB modules have the benefit of being powered through the USB connection while the RS485 interface can support up to 255 modules on a local network over a thousand feet in length. An isolated USB to RS485 hub is also available if required.



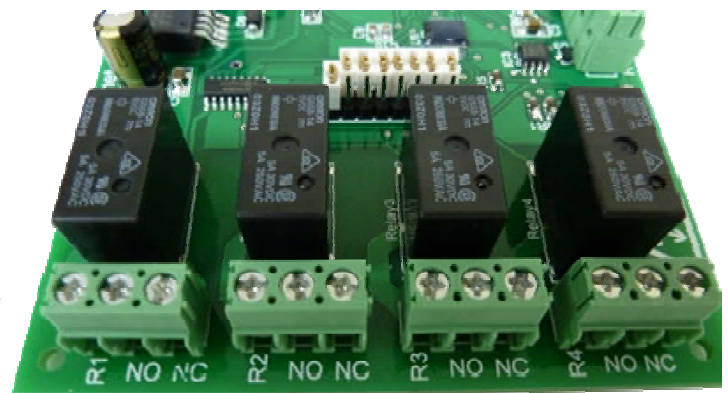
Module Selection - Z1216

The model Z1216 has 8 open collector digital outputs and 8 high impedance digital/analog inputs. Each of the digital outputs can sink up to 350ma or be configured as a Pulse Width Modulated (PWM) output. On the input side the Z1216 has 8 inputs that can be configured that can be configured under software control as a digital input, 0 - 5 volt analog inputs, or a pulse input. Analog to digital conversion resolution on the analog inputs is 12 bit. The pulse latching and counting mode of operation detects and counts pulses

3 msec and larger and maintains an onboard count of the pulses that can be read under software control.

Module Selection - Z1204

For output applications controlling higher current loads Ctek's model Z1204 has 4 independent SPDT mechanical relay circuits, each under independent software control. Each relay is capable of handling up to 5 amps at either 30VDC or 250VAC. Switching speed on a relay circuit is 100msec or less. The Z1204 is ideal for managing mid range lighting, motor control, and digital signage circuits or as an intermediate step in controlling high power industrial circuits.



Module Selection - SkyPower

For applications requiring additional current capacity the SkyPower option is available on all Ctek W series all weather models. SkyPower provides integrated control of a 15 amp (115/240 VAC) SPST relay. SkyPower is ideal for cycling heavier lighting or control loads and for resetting remote equipment racks.



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Ctek Wireless Automation Control Framework

Packaging and Power Management

W - Series

Equipment installed in monitoring and control applications is often exposed to the rigors of the weather and corrosive environments. Ctek's W Series packaging is an option that provides the environmental protection of a NEMA-4X/IP66 case, a vandal proof stealth antenna, and the convenience of a conduit ready flying lead power connection. Weatherproof fittings are available for I/O connections and extending power to additional devices. W Series packaging is available for all Ctek SkyRouters and NetServers. The W Series package is a highly configurable industrial communications controller that uses rugged internal metal mounting plates to securely fasten an extensive list of communications and I/O devices. Fully configured a W Series SkyRouter pack is capable of housing:

- ◆ SkyRouter or NetServer - any model
- ◆ 900MHz Industrial radio
- ◆ Two stealth cellular antennas
- ◆ 24 VAC power supply
- ◆ 2 Ctek I/O boards - either model
- ◆ SkyPower 15 amp relay
- ◆ Badger wireless flow meter receiver

Obviously very few applications would require all of these components but clearly this is an industrial communications controller that can grow with your requirements.



PowerMinder

Solar powered industrial applications are becoming increasingly common and cellular communications is often a key component. Ctek's PowerMinder feature set significantly reduces power consumption in Ctek SkyRouters by managing a schedule of when the SkyRouter will be actively connected to the network and when it can be placed in a low power standby mode of operation. PowerMinder consists of two components, a SkyRouter resident scheduling application and a hardware low power standby controller that reduces

standby power consumption to micro amps. Designers of solar and battery powered applications will find the PowerMinder feature set particularly useful to minimize the solar panel and battery requirements at each remote site.



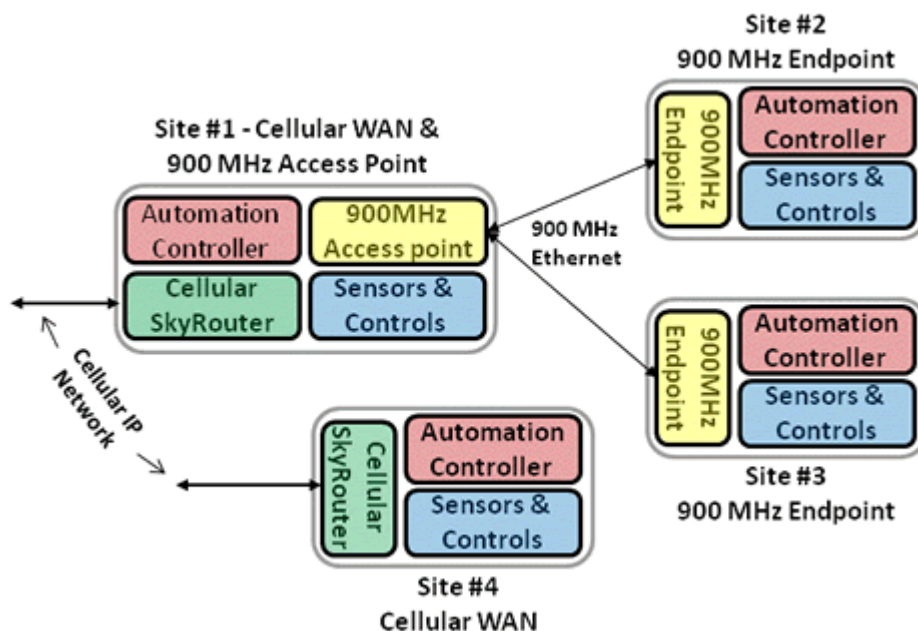
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Ctek Wireless Automation Control Framework

Ctek Wireless Communications – Bringing it all together

Whether it's GSM, CDMA, or 900MHz wireless Ethernet Ctek has the wireless communications capabilities that your application needs. Ctek has a large selection of wireless routers for every network, all built on the Linux operating system and complete with firewall, GRE tunneling and a host of security and application options. Many combinations of Ethernet, RS232, RS485, and USB LAN connectivity are available. All SkyRouters are available as branded or private label product.

Ctek's 900MHz wireless Ethernet capability offers system designers the option to consolidate a large number of local endpoints through a single cellular connection. Administration and network management is fully integrated, meaning that a single SkyRouter cellular unit can manage 900MHz endpoints and route traffic from a complex local area network of sensors and control modules.



- ◆ Optimized for cellular
- ◆ Integrated 900MHz
- ◆ Web Access
- ◆ Security
 - Cellular - IPsec
 - 900MHz - 128 bit AES
- ◆ Remote Alarms
- ◆ Spread sheet reports
- ◆ Private Labeling

Cellular Networks

- ◆ All W and Z Series SkyRouters
- ◆ HSPA/UMTS/GPRS/EDGE
- ◆ EVDO Rev A, 1xRTT
- ◆ Linux OS with Dev Kit
- ◆ GPS
- ◆ GRE Tunneling
- ◆ SMS - MO/MT
- ◆ IPsec Available
- ◆ Approved all networks

900MHz Wireless Ethernet

- ◆ Available in W Series Package
- ◆ Access Point or Endpoint
- ◆ Up to 12 Access Points
- ◆ Up To 16 Endpoints
- ◆ 128 Bit AES Encryption
- ◆ Up to 30 mile range line-of-sight
- ◆ Built in Spectrum Analyzer
- ◆ Unlicensed Spectrum



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Ctek Wireless Automation Control Framework

Ctek Automation Framework – A Total Solution

Communications

Cellular - Ctek SkyRouter

Industrial Cellular Router
HSPA/UMTS
GPRS/EDGE
EVDO/1xRTT
NEMA 4X/IP66 Enclosure
Power - Z Series 9 - 24 VDC
Power - W Series - 24VAC

Industrial 900MHz Ethernet

Long Range - Up to 30 Miles
Excellent In-building Coverage
Bit rates over 900kbps
IP Addressable - Cellular or wire
Power - Internal W Series Power
Temperature - -40 C to 80 C



I/O Modules

Z1216

RS485 or USB Communications
8 Outputs - Digital or PCM
8 Inputs - Programmable

- ◆ Analog
- ◆ Digital
- ◆ Pulse

Power USB or 9 - 24 VDC
Temperature - -30 C to 70 C

Z1204

RS485 or USB Communications
4 Independent Relay Circuits
5 amps at 240VAC/30VDC each
Switching Time - 100 msec
Power USB or 9 - 24 VDC
Temperature - -30 C to 70 C

Options

W Series Packaging

NEMA 4X Polycarbonate Case
Power - 24VAC via conduit connection
Maximum Configuration

- (1) SkyRouter or NetServer - any model
- (1) 900MHz Industrial radio
- (2) Stealth cellular antennas
- (1) 24 VAC power supply
- (2) Ctek I/O boards - either model
- (1) SkyPower 15 amp relay option
- (1) Badger wireless flow meter receiver

SkyPower

One 15 amp 240VAC or 240VDC Relay
Managed From Automation Application
Managed From SkyRouter I/O Screen
Managed using SMS (text messaging)
Power (Coil) - Sourced from SkyRouter
Temperature - -30 C to 70 C

PowerMinder

RS485 Communications
Power - 9 - 24VDC
Standby Power Consumption < 300 micro amps
Temperature - -30 C to 70 C

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