

# The Sage Advisor

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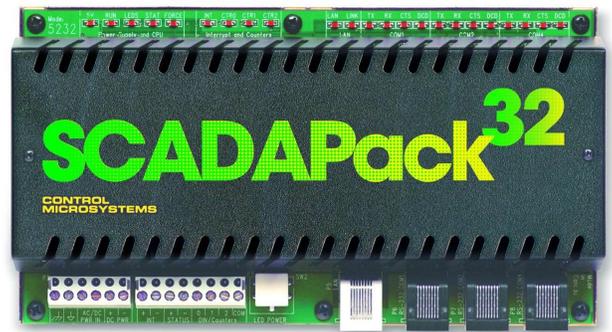
□ □ □ Industrial Automation & SCADA Specialists serving California & Nevada □ □ □

## Speed, Power & 10-Base-T Ethernet

*Introducing the SCADAPack 32.* . . Control Microsystems has just released their newest member of the SCADAPack family of controllers. The SCADAPack 32 and Micro 32 use the latest surface mount technology and laptop power saving CPU chip sets to offer dramatic performance improvements and enhancements, while costing less than its smaller cousin, the SCADAPack Plus.

### Available in two models:

The new SCADAPack comes in a controller only version called the SCADAPack Micro 32 which has just 4 digital inputs, but is expandable to over 700 I/O points using standard 5000 series modules. Possible applications include multi-run gas flow computer, communications controller/gateway, datalogger or specialized programmable controller, front end controller (FEC).



## Lookout Training Courses

With one of the few National Instruments' Certified Lookout Instructors outside the factory on staff, Sage Designs has been providing on-site Lookout training for companies in many areas in the US. From NASA Engineers at the Johnson Space Center in Las Cruces, New Mexico, to OEMs in Minnesota and Los Angeles and Integrators and Municipalities throughout California, customers of our training services have taken advantage of our high level of expertise and understanding of SCADA to enhance their knowledge of Lookout. In addition to instruction in the basics and advanced features of creating a Lookout application, our instruction offers some simple ABCs on program structure, shortcuts and avoidance of pitfalls to greatly reduce learning curves and integration time.

Some of the subjects covered in the two-day basics course include:

- Lookout Process Files
- Lookout Objects
- Expressions
- Driver Objects
- Trending
- Alarms
- Security

The advanced course provides the necessary knowledge for students to migrate an older Lookout application or create new ones that allow access to new features provided by current Lookout versions. Advanced networking capabilities such as remote access and web-based clients, fail-over redundancy and access of Lookout data by other applications are some of the subjects that can be covered in the advanced classes which are customized to each customer's needs. Some of the subjects for which instruction is offered are:

- Advanced Objects
- Recommended Architecture
- Networking
- Creating Web Clients
- Redundancy
- Lookout Source File Modification
- Access to Archived Data

Let us show you just how powerful and flexible a product Lookout can be. *Call for a detailed proposal or to schedule your training sessions today.*

The SCADAPack 32 utilizes the same lower I/O board as the traditional SCADAPack with 8 analog inputs, 20 digital inputs (3 of which can be used as high speed counters for turbine meters), 2 optional analog outputs, and 12 relay outputs. Expansion to over 700 I/O points is possible through the addition of 5000 series modules.

### Ethernet & Comm Port Enhancements:

The SCADAPack 32 comes with a 10-Base-T Ethernet connection. Initial implementation includes the Modbus TCP/IP protocol, also known as Open Modbus. This protocol is supported by most HMIs including Wonderware using the 'Quantum driver' or National Instruments' Lookout 'Modbus Ethernet Driver' as examples.

The main SCADAPack 32 controller card adds an additional serial port, bringing the count to 3 serial ports for the SCADAPack Micro 32, or 4 serial ports for the SCADAPack 32. Additionally, one of the main controller serial ports is selectable between RS-232 and RS-485, allowing simple multidrop communications to the many smart instruments now available with Modbus RS-485 connections. This includes gas detection, variable speed drives, level sensors, and smart 3-in-1 transmitters for natural gas measurement.

### Programming Environments:

The SCADAPack 32 has implemented all 5 languages of the Open Programming Standard IEC-61131, including: function blocks, ladder logic, structured text, instruction list, and sequential function charts. Powerful functions particular to SCADA have been added to reduce programming development times. These include archiving, both analog and digital PID controllers, store-and-forward capability, and flow functions used to accumulate pulse input rates.

### Multiple Open Protocols Supported:

In keeping with Control Microsystems' belief that it is in the customers' best interest to provide open systems, only standard protocols will again be provided. The de-facto protocol offering is Modbus RTU, ASCII and Ethernet TCP/IP. Later in 2001, Allen Bradley's DF-1 protocol and DNP-3.0 will be offered as options.

# RTP Hybrid Control Systems

For over thirty years, RTP Corp. has manufactured high-performance industrial control equipment. Today its flagship product is the RTP 2000 Hybrid Control System, which combines the best features of PLC/PC Windows-based HMI technologies with the tightly coupled configuration strategies of a DCS. The result is full DCS functionality coupled with powerful HMI technology, Windows-based programming, and a consolidated database architecture.



The basic RTP 2000 system includes a standard 19" rack-mountable chassis with an integral power supply, an embedded processor, and sixteen I/O option card slots—expandable up to a total of eight I/O chassis. The embedded processor, which includes 16MB memory, a high-performance Intel-base architecture, and an RTP bus controller, provides more than ample support to execute the most demanding industrial control strategy including cascaded and advanced feed-forward PID control.

A full line of analog, digital, and special function I/O cards for practically any industrial application are available. Analog I/O options include non-isolated, isolated, and high-density models with both current and voltage mode options. Thermocouple and RTD cards provide onboard calibration channels to facilitate maintenance activities. Both AC and DC digital I/O cards are available. Digital input cards support SOE (Sequence-Of-Events) time stamping with 1 millisecond resolution, and I/O option cards are designed to be hot-swappable. If you have requirements that are not provided by the standard selection of I/O cards, RTP Corp. offers a wide range of custom engineering and design services to assist you with your unique application requirements.

For higher reliability, RTP offers the RTP 2200 Redundant Hybrid Control System. A superset of the RTP 2000, it includes dual controllers, backplanes, Ethernet networks, and power supplies. Hot-standby support requires no additional programming and includes functionality such as bumpless transfer and non-intrusive reinitialization. Watchdog timers provide automatic transfer to the hot-standby processor if an error is detected in the primary processor, an I/O card, or network communications. Also expandable to eight I/O chassis, the RTP 2200 allows any combination of redundant and non-redundant I/O to be configured.

Both the RTP 2000 and RTP 2200 are supported by NetSuite. This Windows-based (NT/W2K) software package is an integrated development environment that includes a drag-and-drop graphical configuration environment. You can develop your industrial application using any combination of module objects, ladder logic, and C/C++. A simulation engine allows you to test the logic of your application prior to hardware integration. Integrated trending and

archiving utilities help you keep your industrial control application running at its peak efficiency. A high-performance HMI is included with NetSuite. With unlimited licenses unencumbered by hard keys or soft keys, you can use it on as many workstations as you need, plus free upgrades for the life of the product.

The RTP 2000 Hybrid Control System is a versatile product suitable for industrial applications such as vibration monitoring, water and wastewater treatment, boiler and turbine control, and continuous process monitoring and control to name just a few. You'll find that its open architecture design easily integrates with external applications and other plant business systems. With a three-year hardware warranty followed up by an exclusive non-obsolescence policy, you will rest assured that your system will be supported by RTP Corp. for the normal life span of your plant.

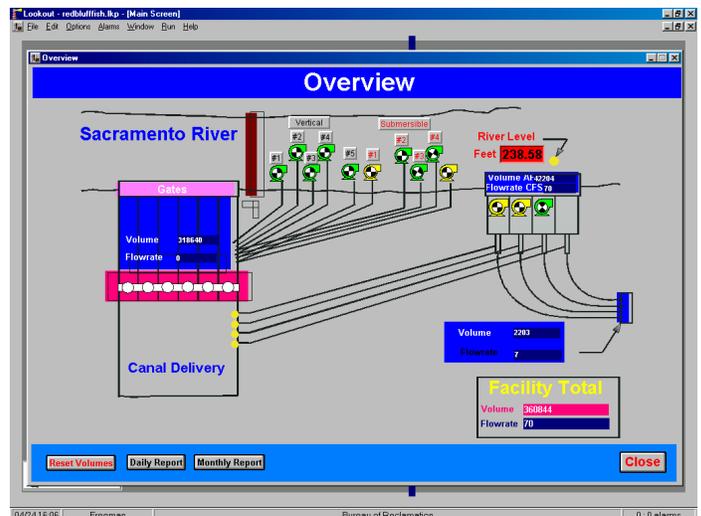
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## Irrigation Control Solutions

Concepts in Controls, Inc. of Visalia, a systems integration firm, has used Control Microsystems equipment and National Instruments Lookout software for a variety of SCADA integration applications for the last seven years. In one application, Concepts in Controls solved multiple problems for a client, resulting in significant cost savings.

In this instance, Concepts in Controls set up a SCADA system that automatically controls a gate in order to maintain a canal level. This system not only controls the gate, but also controls the pump motors and monitors the bearing temperature in each motor. Concepts in Controls established temperature setpoints and alarms that page the operator when temperatures are too high. Consequently, the client can perform preventative maintenance on the motor bearings, resulting in lower repair costs and increased production from better control over unscheduled downtime.



Lookout software provides a user-friendly interface for the client and allows for easy expansion. Using Lookout together with Control Microsystems equipment, Concepts in Controls can provide a cost-effective solution for a client's SCADA needs. For more information, Concepts in Controls can be reached at 559-738-1871.

# Remote Data Logging in SCADA Systems Comes of Age

New features from two SCADA market leaders have combined to provide the ultimate in remote data logging for your SCADA system. The first of these innovations comes from Control Microsystems which allows the SCADAPack series SCADA Controllers to efficiently record historical data on-board.

This system consists of new programming functions for TelePACE Ladder Logic and TelePACE C Tools to create up to 16 separate data logs in a SCADAPack or Micro16 controller and a user interface to access these data logs.

A new TelePACE Ladder Logic function, Data Logger, is used to configure each data log in a controller. Up to 16 separate data logs may be configured in a SCADAPack or Micro16 controller. Each log is individually configured for data and type of date to be logged and the log interval. This gives users the flexibility to log data in a manner that is most useful for their application.

A data log consists of a set of records that contain user-selected data. Each data log record may have a maximum of 8 data fields. The data fields may be of the type 16-bit signed or unsigned; 32-bit signed or unsigned; 32-bit floating point

The screenshot displays the SCADALog software interface. It features a menu bar (File, Edit, View, DataLog, Communication, Window, Help) and a toolbar. The main window is divided into several panes. The top pane shows a list of data logs with columns for 'Time and Date', 'Run 1 Value', 'Run 2 Value', 'Run 3 Value', and 'Run 4 Value'. Below this, there are multiple 'Data Log 1' windows, each displaying a table of logged data with columns for 'Time and Date', 'Line 1 Avg Press', 'Line 2 Avg Press', 'Line 3 Avg Press', 'Line 4 Avg Press', 'Line 5 Avg Press', 'Line 6 Avg Press', 'Line 7 Avg Press', and 'Line 8 Avg Press'. The data rows show numerical values for each field over time.

## Are Modbus' Days Numbered?

To date, Modbus has been by far the most successful SCADA protocol used. It is supported by thousands of users, and has become the de facto standard across a wide variety of markets and applications. Modbus has a few shortcomings in some common SCADA applications; for this reason, there have always existed a number of proprietary protocols which have been successfully marketed into the niches which Modbus cannot completely fill.

Areas where Modbus falls short are generally only an issue with larger SCADA systems, where dozens, or hundreds of remotes can make for unacceptably long polling cycles. Even with support for event-driven Modbus mastering in Control Microsystems' SCADAPack and the Modbus Slave object for unsolicited messaging in National Instruments' Lookout, this type of report-by-exception solution cannot answer all of the shortcomings of the Modbus protocol. In general, Modbus cannot support all of the protocol features that electrical utilities and other large SCADA applications need.

To respond to more demanding SCADA system needs, the IEEE has issued a specification for a protocol called DNP3 (Distributed Network Protocol). DNP offers of features which have been a mainstay of some utility SCADA systems. Among these features:

- Multiple masters & peer-to-peer communications
- Unsolicited messages from slaves
- Segmentation of messages
- Secure file transfer
- Event data with time stamping

DNP raises the standard for protocols, so that you no longer have to turn to a proprietary system if you need advanced features in your SCADA system. Although the list of vendors supporting DNP is considerably shorter than the list of those supporting Modbus, the strengths of this protocol are your assurance that this list will lengthen.

Both Control Microsystems and Lookout have DNP3 support. If you would like to know more, see: <http://www.dnp.org/about/index.asp>.

and cmi date in the format yyyy/mm/dd/hh/mm/ss. The number of records that may be logged in a SCADAPack or Micro16 controller will depend on the size of memory available. With the 512K RAM option installed approximately 198,000 words of data may be logged in the controller.

Data is logged at user specified intervals for each individual data log. To simplify the configuration of a data log two new TelePACE Ladder Logic functions, pulse seconds and pulse minutes have been added. These functions are used to generate periodic square wave pulse outputs. Using these new functions it is easy to configure a data-logging interval from once per second to once per 65535 minutes.

The other innovation comes from National Instrument's Lookout software in the form of a Logger object. The new Logger object in Lookout allows the program to poll the remote hardware for historical data with time-stamp information. Data is then entered into the Citadel historical archived data via the Logger and then becomes available to the Hypertrends, SQL and other database functions.

If all you wanted was a stand-alone data logger, the SCADAPack with its wide environmental specifications, rugged construction and low power requirements would be competitively priced. Add the real-world communications capabilities and the connectivity to the Lookout and you have remote data logging and control capabilities unequalled in the SCADA world.

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