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RACO®
REMOTE ALARMS AND CONTROLS
1948-1998 50th ANNIVERSARY
RACO Manufacturing and Engineering Co., 1400 62nd St., Emeryville, CA 94608 (510) 658-6713 800-722-6999 FAX (510) 658-3153

CATALYST INTERACTIVE COMMUNICATION SYSTEM SPECIFICATION

May 4, 2001

Summary Overview Description:
The unit shall be capable of continuously scanning its own physical input channels plus channels at specific address locations within a variety of Remote I/O (RIO), Programmable Logic Controllers (PLCs), Distributed Control Systems (DCSs) & SCADA systems, using the standard Modbus RTU industrial network protocol. Connection for Modbus connected channels shall be via a single serial interface cable. The unit's built-in channels shall be four universal (analog/digital) physical inputs.

The unit shall be able to monitor, log events, and take data samples for all channels plus its own primary power source and phone line. For alarms, scheduled reports, and log data file transfers, the unit shall be capable of dialing up to 96 destinations (phone numbers), each up to 60 digits in length, organized by group lists as configured by the user. Destinations types shall include voice telephones, log data collection stations, pagers, and fax machines. Report types shall be configurable, as appropriate for different destination types, to include report items such as alarms, events, configuration changes, and periodically sampled channel data logs.

The unit shall also allow incoming calls for the purpose of checking primary power and channel status, making configuration changes, and for retrieving data logs. Incoming calls shall be allowed from voice telephones, data collection stations, and from the Raco® Alarmware® software. Inquiry and programming calls, if so configured, shall require that users enter their unique 4-digit PIN password in order to proceed in receiving reports or configuring the unit.

1. User Configurable via Front Panel, Remote Telephone or Raco® Alarmware® Software:
The unit shall be capable of being configured via a local or remote computer running Raco® Alarmware® software under Windows 95/98, or alternatively via the system's keyboard, or via a Touch Tone phone, at the user's choice. No reliance on physical jumper or switch settings shall be necessary for configuring the unit. All programming including speech files shall be capable of being copied, stored, edited and transferred via the Raco® Alarmware® software. Further, the entire operating firmware (the microprocessor instruction code, not just user programming data) shall be upgradeable via transfer from a remote computer, without need to travel to the unit's location.

2. User Flash Memory for Data Logging and User Voice/Text Messages
The unit shall include a minimum of 1 Megabyte of user flash memory to be used both for user recorded voice and text messages and for the data logging file. Orderable options shall be available to increase the size of user flash memory to 5 Megabytes total.

3. Data Logging
Data logging shall be configurable to log, with date/time stamps, events and periodic data samples. Logged events shall include: alarms, acknowledgments, channel state changes, and configuration changes made during front panel and remote operator sessions. Logged periodic data samples shall consist of snapshots of all configured channel values and alarm states.

The unit shall be able to automatically deliver data logs to destinations configured as faxes, local data logging (LDL) printers and as remote data logging (RDL) computers running generic data collection software. Data logs shall also be retrievable by the Alarmware® software. Data logs shall be transferred in the formats of: plain text, comma-delimited fields, and comma-delimited key word fields. The latter two formats shall be importable into spreadsheet programs such as Microsoft Excel.

The total amount of user flash memory shall be shared between user messages and the log file. The amount of user flash memory reserved for data logging shall be configurable. The user shall be able to set a “buffer nearly full” threshold percentage, which when reached, will cause automatic calls to RDL logging destinations to automatically transfer the accumulated log file. Receipt of these automated download calls shall be via a computer running generic communications software.

4. Local Data Logging:
The unit shall include a serial printer interface for local data logging. The local printer will automatically print out, with date and time stamp, events, alarms, acknowledgements, programming sessions, inquiry calls, plus data samples at the selected sampling interval.

5. Event Logging/Audit Trail Feature:
The unit shall maintain a log of events which can be retrieved, reviewed and printed at any time locally or remotely via Raco® Alarmware® software, providing a complete audit trail for all alarms, programming sessions, incoming calls, acknowledgements and other relevant events, user configurable to allow in excess of 1,000 events to be retained. If PIN password security is configured, the PIN holders name (not secret PIN number) shall be noted on data logs for all events requiring PIN entry.

6. Voice and Text Message Features
The unit shall be capable of recording and re-recording speech messages in the user’s own voice, which shall be stored in permanent non-volatile solid state user “flash” memory. The unit shall allow these recordings to be made from a remote telephone as well as from a built-in microphone at the front panel.

Total Available Message Recording Time at the “high-fidelity” recording rate setting shall be 4.8 minutes for units with 56 input channels or less, and 24 minutes for units with larger numbers of channels. These times shall be doubled for the “utility” recording rate setting. The total message recording time may be allocated among the various messages without restriction as to length of any given message, and any given message shall be recordable at either rate for maximum flexibility. Additional user flash memory for additional recording time (and data logs) shall be an orderable option. Recordable message elements shall include at a minimum:

•Two message segments for each input channel, which may be used for “normal” and “alarm” indications or for two-part analog reports.

•A separate Station ID message, which is automatically included at the start of each report.

•A variety of “Tag” words, which are automatically appended to each input channel report, indicating various stages of alarm and acknowledgement for that channel.

In addition to user-recorded messages, the unit shall incorporate:

•Alternative Generic Default Speech Messages for use when the user elects to not record any or all of the above message types.

•Provision for user programmable Text Messages corresponding to each of the voice messages, which are automatically substituted for voice messages in any reports directed to text-type destinations such as a computer file, fax report or other printout.

7. Input Channel Monitoring Function:
The unit shall continuously scan all configured input channels on the Modbus serial connection and the four internal physical input channels. The unit shall be capable of monitoring any data register regardless of register type, whether digital, analog, input, output or status point. Alarm criteria shall be settable as appropriate for different data register type.

A. For digital channels, alarm criteria shall be settable for alarm on 0 raw value, 1 raw value, or alarm never (for status reports only).

B. For analog channels, both a high setpoint and a low setpoint alarm criteria shall be settable.

C. All channels shall have settable alarm criteria for alarm on serial communications failure only.

In addition to monitoring the readings of designated input locations, the unit shall be configurable to automatically and continually write the values read at designated input locations into other designated register locations. Also it shall be possible to manually write values into register locations from the front panel, via remote telephone or via Raco® Alarmware® software.

8. Alarm Reports to Destinations:
After the expiration of programmed Alarm Trip Delays, loss of primary power or violation of channel alarm criteria shall cause the unit to go into alarm state and begin dial-outs to destinations configured to receive alarm reports. Further, upon failure of any communications channel the unit shall enter the Communications Failure alarm state and begin contacting destinations.

Selectable Destination types shall include voice telephones, pagers, fax, email, remote data terminals such as computers running generic communications software, and a locally connectable serial printer.

Destination-Channel grouping shall be programmable to designate which destinations are to receive calls and reports initiated by which input channels.

Each Destination shall be independently configurable as to which categories of reports are to be delivered to that destination.

Text mode reports shall be configurable as full text, comma delimited text or comma delimited key words, independently for each Destination.

9. Multiple Call Attempts to the Same Destination
Using Call Progress Monitoring (CPM), the unit shall be capable of making multiple repeat calls to a busy or non-answered phone number before moving on to the next phone number.

10. Phone Line Testing
Phone line testing shall be programmable to test the unit's phone line at regular intervals and to provide local indication if there should ever be a failure of the phone line. In this event, when the phone line is later available, the unit shall place alarm report calls to advise that a phone line fault had occurred.

11. Alarm Acknowledgement
Alarm report calls shall continue at programmed intervals indefinitely until acknowledged.
Acknowledgement of an alarm phone call shall be accomplished by pressing a Touch Tone "9" as the alarm call is being received, and if so configured, by returning a phone call to the unit after having received an alarm call, or via the front panel keypad. If so configured, the user's 4 digit PIN password shall be required to hear the report and to acknowledge alarms.

The unit's log file shall maintain event records of all alarms, acknowledgements and incoming calls and that log file shall be retrievable at any time to provide an audit trail record.

12. Diagnostics:
The unit shall be capable of executing user commands for diagnostics on the Modbus RTU network to determine the health of the network. The unit shall inform the user of the length of scan time for the set of all configured channels on the network.

13. Primary Power and Battery Backup:
Normal primary power shall be either 105-135 VAC, 15 watts nominal, or 12 VDC at 900 ma maximum. Orderable options shall include 240 VAC and 24, 48 or 125 VDC. The unit shall contain its own sealed lead acid rechargeable battery that is automatically kept charged when primary power is present. The system shall operate on battery power for a minimum of 10 continuous hours in the event of primary power failure. A shorter backup time shall not be acceptable. The built-in charger shall be precision voltage controlled, +/- 1%, not a "trickle charger," in order to minimize recharge time and maximize battery life available.

14. Phone Line, FCC approvals:
The unit is to use a standard rotary pulse or Touch Tone "dial-up" phone line (direct leased line not to be required) and is to be FCC Part 68 approved with a valid registration number. Connection to the telephone is through a standard modular jack (RJ-11). The unit shall conform to FCC Part 15B for EMC emissions.

15. PIN Security Protection:
The unit shall incorporate four separate levels of PIN password protection:
Read (inquiry) only
Acknowledge
Change Configuration Settings
Administrator

16. Public Address Broadcast:
The unit shall include a jack for optional connection to a local public address system. If connected to the PA system the dialer shall broadcast all alarm messages over the PA system and the telephone simultaneously.

17. Integral Surge Protection:
All power, phone line and discrete physical signal inputs shall be protected at the circuit board to IEEE Standard 587, category B (6,000 volts open circuit/3,000 amps closed circuit). Gas tubes followed by solid state protectors shall be integral to the circuit board for each such line. Protectors mounted external to the main circuit board shall not be an acceptable substitute. The installer shall provide a good electrical ground connection point near the unit to maximize the effectiveness of the surge protection.

18. Technical /Customer Support:
All users shall be provided and/or shall have access to the following support resources.

A. A toll free 800 number shall be available during manufacturer's normal working day to permit users to talk directly with technical service personnel and resolve problems not resolved by either the Catalyst CD-ROM or the Technical Support information provided at RACO's website www.racoman.com.

19. Warranty:
The unit shall be covered by a five (5) year warranty covering parts and labor performed at the Factory.

20. Memory Upgrades, Remotely Downloadable Firmware Modifications:
The unit shall permit expansion of memory capacity via available plug-in memory modules. Firmware upgrades shall be possible from remote computer locations without need to travel to the unit's location, as well as at the unit's location via serial port connection if so desired.

21. Additional Features: Sealed Switches, LED Indicators, Alarm Disable Warning:
All keyboard and front panel switches shall be sealed to prevent contamination. Front panel LED's shall indicate: Normal Operation, Program Mode, Phone Call in Progress, Status for each channel or group of channels, AC Power Failure, and Low, Discharging or Recharging Battery, and Disarmed state. On any Inquiry telephone call or On Site status check, the voice shall provide specific warning if no destinations are configured, if the unit is in the "alarm disable" mode, or if AC power is off or has been off since the last report.

22. Special Order Items:
The following options shall be available on specific order:

a) Cellular wireless telephone communications
b) NEMA 4X (sealed) enclosure.
c) Thermostatically controlled heater (on AC powered units only).
d) Additional Flash memory capacity
e) Additional remote channel monitoring capacity

Specifications subject to change without notice.