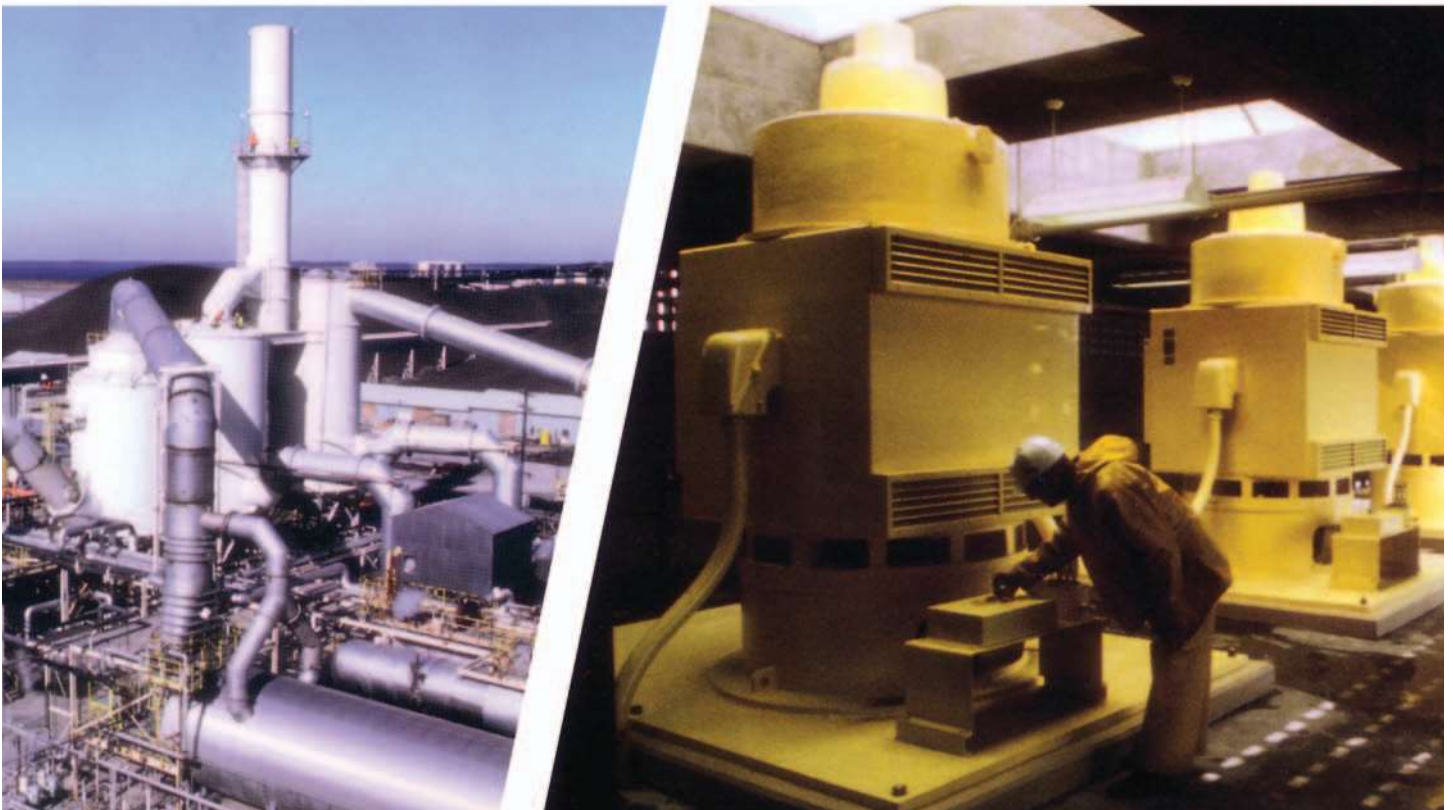# Verbatim®

by RACO®
REMOTE ALARMS AND CONTROLS

…Clearly a step ahead in remote monitoring systems

Verbatim®

...the interactive alarm autodialing, monitoring, reporting, and control system.

RACO Verbatim, the long-standing first choice of the industry, offers pace-setting functionality and expandability– It's an autodialer alarm system, a remote monitoring system, a supervisory control system, a SCADA system, and a PLC network interface-in one compact package.

With an expandable, modular bus architecture and up to 32 digital inputs, 16 analog inputs, and 8 digital control outputs, the system can monitor flow, level, pressure, temperature, pH, and other types of sensors, as well as control remote electrical devices.

■ Alarm Autodialing

The system is designed to continuously monitor preset alarm points. If an alarm condition is sensed at a monitored point, the Verbatim System will automatically dial a list of 16 pre-programmed emergency telephone numbers, calling until it gets an answer. When the call is answered and acknowledged, the system reports the alarm location and status via pre-recorded voice messages.

Communicating over standard landline or wireless telephone networks, the Verbatim delivers alarm messages to standard phones, cell phones, numeric or voice pagers, and voice mail systems, and talks just as easily with computers.

■ User-Recorded Messages

The voice messages are digitally pre-recorded by the user. Anything that can be spoken is accurately stored in memory–from names and numbers to technical terms and detailed instructions. Messages are delivered with maximum clarity, lessening the chance for misunderstanding or error. And, you can easily enter or change your messages over the phone or at the front panel.

■ A Fully Interactive System

With Verbatim, you're never out of touch with your monitoring system. With any standard touch-tone phone, you can call in for a status report, review and change programming, or control a remote device. With the touch of a key, you can listen to local sounds or talk to personnel using the unit's built-in speakerphone.

When calling for status report, you hear a comprehensive summary of all conditions monitored by the system, including internal power. Hard copies of event data–alarms, acknowledgements, inquiries, and programming changes– can be printed out at any time using the system's data logging capabilities.
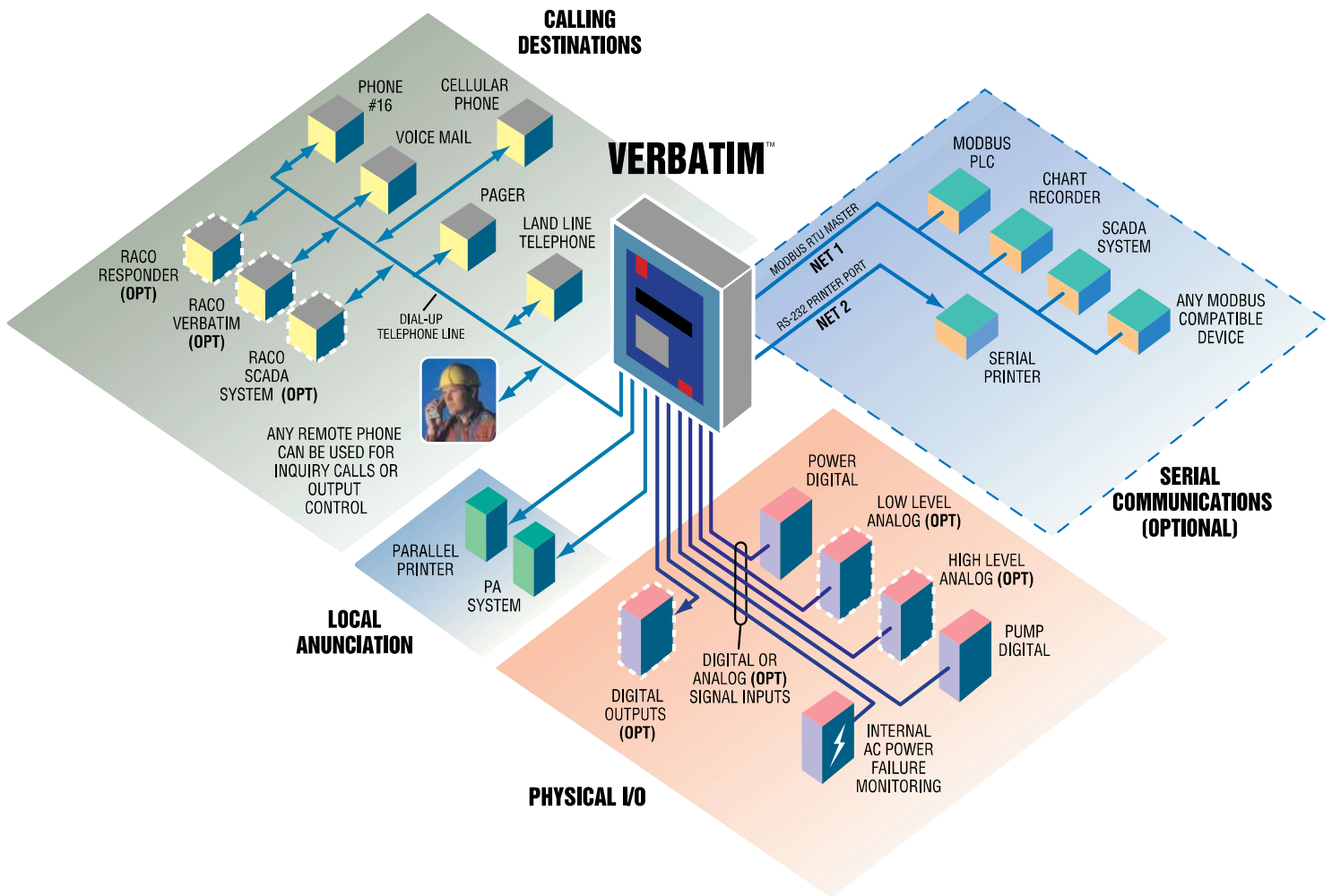
Controls and indicators are provided on the Verbatim's front panel for on-site programming and review of system operation, alarm status, and battery condition.

■ Supervisory Control System

A Verbatim System can be equipped with up to 8 digital control outputs to remotely actuate HVAC systems, pumps, compressors, and other electrical devices from a standard phone, the Verbatim front panel, or a PC.

■ SCADA System

RACO MMI/SCADA Systems provide monitoring and control of up to 200 RACO Verbatim Remote Terminal Units (RTUs) over the standard dial-up telephone network. Each RTU has full alarm monitoring, reporting, and autodialing capabilities, and because Verbatim systems report by exception, they do not need to be polled. When an alarm is sensed, the RTU reports to the central computer. If the computer operator does not acknowledge the alarm, the RTU will commence autodialing.

CALLING DESTINATIONS

PHONE #16

CELLULAR PHONE

VOICE MAIL

PAGER

LAND LINE TELEPHONE

RACO RESPONDER (OPT)

RACO VERBATIM (OPT)

RACO SCADA SYSTEM (OPT)

DIAL-UP TELEPHONE LINE

ANY REMOTE PHONE CAN BE USED FOR INQUIRY CALLS OR OUTPUT CONTROL

VERBATIM™

MODBUS RTU MASTER — **NET 1**

RS-232 PRINTER PORT — **NET 2**

MODBUS PLC

CHART RECORDER

SCADA SYSTEM

SERIAL PRINTER

ANY MODBUS COMPATIBLE DEVICE

SERIAL COMMUNICATIONS (OPTIONAL)

PARALLEL PRINTER

PA SYSTEM

LOCAL ANUNCIATION

POWER DIGITAL

LOW LEVEL ANALOG (OPT)

HIGH LEVEL ANALOG (OPT)

PUMP DIGITAL

DIGITAL OR ANALOG (OPT) SIGNAL INPUTS

DIGITAL OUTPUTS (OPT)

INTERNAL AC POWER FAILURE MONITORING

PHYSICAL I/O

PLC Network Interface

Offering alarm and monitoring for as many as 96 remote channels, the Verbatim can use RS232 communications to work with any PLC or other device using Modicon's Modbus protocol.

Take Control of Remote Equipment

A Verbatim System can be used with a RACO Responder or another Verbatim to actuate pumps, compressors, gates, or other electrically operated equipment over the dial-up telephone network. Upon receipt of an alarm signal–low water level, for example–the Verbatim issues a command to activate an output relay in the Responder or other Verbatim unit, which initiates an action such as turning on a pump motor.

Memory Retained During Power Failure

Verbatim systems incorporate a non-volatile memory. Recorded alarm messages and user-entered programming is retained indefinitely in the event of a power loss.

Battery Backup for Safety

A rechargeable gel-cell battery provides up to 20 hours of continuous operation in the event of power loss. And because the system uses a precision regulated charger instead of the traditional "trickle" charger, the time required for charging is minimized and battery life is significantly extended.

Built for Long Term Survival in the Toughest Environments

Verbatim is designed and built for superior performance-year after year. The system's rugged durability is evident in its heavy-duty metal enclosure, carefully selected and proven solid-state components, and sealed membrane keyboard. Heavy-duty solid state and gas tube surge protection is provided on all power, phone, and signal lines.

Verbatim ®

Features:

- Monitors 4 channels plus internal AC power
- Solid-state message recording
- Expandable modular design
- Superior surge protection on all inputs
- Alarm call grouping
- Low cost
- Remote programming
- Nonvolatile memory
- 20 hour battery backup
- 5 year warranty

Typical Monitoring Applications:

- Boilers
- Chemical Plants
- Computer Rooms
- Facility Security
- Fish Hatcheries
- Frozen Food Storage
- HVAC Systems
- Hydroelectric Power Stations
- Pipeline & Compressor Stations
- Remote Pump Stations
- Storage Tanks
- Telephone Switchgear
- Unattended SCADA Systems
- Water & Wastewater Treatment Plants

Typical Sensors:

- Flow
- Leak
- Level
- Motion
- pH
- Power
- Pressure
- Temperature
- Vacuum

Standard Specifications:

ELECTRICAL

- *Power requirement:* 105-135 VAC, 50/60 Hz, 15 watts maximum or 8-14 VDC at 500 mA maximum.
- *Battery charging:* Precision voltage controlled, including automatic rapid recharge after drain.
- *Battery backup:* 20 hours
- *Input sensing:* Four unpowered contact inputs standard. Open contacts see 5 volts DC; closed contacts see 10 ma DC.
- Standard Centronics parallel printer port.

Literature Code #118

PHYSICAL

- *Surge protection:* Integral gas tube and solid-state protectors on all phone, power, and signal lines. Accommodates field-installed upgrades. Rugged metal indoor enclosure.
- *Weight:* 8 lbs. (3.6 kg).
- *Dimensions:* 11-7/8" H x 9-3/4" W x 5" D.
- *Mounting Centers:* 11 3/8" vertical x 6" horizontal.

ENVIRONMENTAL

- *Temperature range:* 20° to 130°F.
- *Humidity:* 0 to 95%, noncondensing.

TELEPHONE

- Rotary pulse or tone dialing, keyboard selectable
- Dials up to 16 different numbers, each up to 60 digits long.
- Allows programming of PBX delays in 1 second increments.
- FCC Registered Part 68, "Ringer Equivalence": 0.3A.
- Alarm Acknowledgement is by TouchTone key or by calling back.
- Built-in speaker phone allows two-way conversation
- Compatible with most cellular telephone systems.

SPEECH MESSAGES

- Users record their own messages. Also includes resident vocabulary for programming guidance and for default "alarm/normal" speech if no user messages are recorded.

UL STANDARD

- Verbatim complies with UL Standards: 1459, 1950.

WARRANTY

- Five year parts and labor warranty. See our separate warranty card for details.

MODULAR OPTIONS

- *Channels.* Upgradeable to 8, 16, 24 or 32 contact channels.
- *Analog.* Custom scaled in the units of measurement required for your job. Analog alarms on a high and a low alarm setpoint. Upgradeable to 1, 4, 8 or 16 analog channels.
- *Remote Supervisory Control.* The operator can turn equipment on or off via any telephone. Upgradeable to 4 or 8 outputs.
- *Modbus Interface.* In addition to physical inputs, the unit is upgradeable to 32, 64 or 96 additional alarms of any type via RS232 and Modbus RTU master protocol.
- *Cellular Telephone.* Our Cellularm™ System provides temporary or permanent alarm autodialing over the cellular telephone network when conventional telephone lines are disabled or unavailable. Furnished in a rugged, weather-resistant housing that's easy to transport and set up.

FACTORY OPTIONS

- *Enclosure.* System available in NEMA 4X enclosure, which is corrosion proof and sealed against 12 feet of water.
- *Environmental.* Thermostatically controlled heater available, suggested for operation below 20°F or where condensation may occur.
- *Local Alarm Relay Output.* Relay activates during unacknowledged alarm conditions.
- *Secure Front Panel.* Verbatim System furnished without front panel programming controls and indicators. Restricts access to unsupervised or remotely located units, as well as reducing the initial purchase price.
- *Solar Electric Generator Systems.* Ideal for remote location applications where conventional power and telephone services are not available or too costly. Provides steady, clean power and has sufficient storage capacity for overcast and inclement weather conditions.

SINCE 1948

RACO ®

REMOTE ALARMS AND CONTROLS

RACO MANUFACTURING AND ENGINEERING CO.
1400−62nd Street, Emeryville, CA 94608 • (510) 658-6713 • FAX: (510) 658-3153
1-800-722-6999 • www.racoman.com

Represented in your area by:

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REMOTE ALARMS AND CONTROLS

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ANNIVERSARY

RACO Manufacturing and Engineering Co., 1400 62nd St., Emeryville, CA 94608   (510) 658-6713   800-722-6999   FAX (510) 658-3153

DIALER SPECIFICATION - VERBATIM® MODULAR SERIES VSS

Description and Phone Number Dialing:
1. The dialer shall be a solid state component capable of dialing up to 16 telephone numbers, each up to 60 digits in length. Phone numbers and Standard pulse dialing or Touch Tone DTMF dialing are user programmable via the system's keyboard or remotely via Touch Tone telephone. In addition, the dialer shall:

** Group Alarm Calls - On alarm, system shall selectively call the correct phone number according to the specific alarm(s).
** Detect Telephone Line Fault and indicate condition with Front Panel LED.
** Automatically select Tone versus Pulse Dialing.
** Monitor Call Progress - Detect Busy and Ringing Signals, Abandon Call if Busy, Wait until phone is answered to Annunciate Voice Reports.
** Provide Numeric Pager Support
** Provide PBX Support

Solid State Voice Message Recording & Playback:
2. The unit shall have two different categories of speech message capability, all implemented with permanent non-volatile solid state circuitry with no mechanical mechanisms. The unit shall allow for message recording from a remote telephone as well as from the front panel.

** User Field Recorded Messages: The user may record and re-record his own voice messages for each input channel and for the Station ID.

a. There shall be no limit on the length of any particular message within the overall available message recording time, which shall vary from 26 to 635 seconds, depending upon the number of input channels selected, and the recording rate used.

b. The unit shall allow selective recording of both Normal and Alarm advisory messages for each input channel.

c. The unit shall provide for automatic setting of the optimum speech recording rate for the total set of messages recorder, in order to achieve optimum recording sound quality.

d. Circuit board switches or jumper straps shall not be an acceptable means of manipulating message length or recording rates.

** Permanent Resident Non-Recorded Messages: Permanent built-in messages shall be included to support user programming operations, to provide supplemental warning messages such as advising that the alarms have been disabled, and to allow the unit to be fully functional even when the installer has not recorded any messages of his own.

Input Monitoring Function:
3. The basic unit shall continuously monitor the presence of AC power and the status of four (4) contact closure inputs. AC power failure, or violation of the alarm criteria at any input shall cause the unit to go into alarm status and begin dial-outs. The unit shall, upon a single program entry, automatically accept all input states as the normal non-alarm state, eliminating possible confusion about Normal Open versus Normally Closed inputs. Further, as a diagnostic aid, unit shall have the capability of directly announcing the state of any given input as currently "Closed Circuit" or "Open Circuit" without disturbing any message programming. Each input channel shall also be independently programmable, <u>without the need to manipulate circuit board switches or jumpers,</u> to any of the following:

** Normally Open, Normally Closed, or for No Alarm (Status Only).
** Run Time Meter - to accumulate and report the number of hours a particular input circuit has been closed. Any channel so configured will never cause an alarm call, rather, on inquiry will recite it's message according to the status of the input and then report the closed circuit time to the tenth of an hour. The input will accumulate and report in tenths of hours up to a total accumulated running time of 99,999.9 hours. The initial value of the Run Time Meter shall be programmable in order to agree with existing electromechanical Run Time Meters. Up to a total of 8 Run Time Meters may be programmed.
** Pulse Totalizer - to count the accumulated number of pulses (momentary contact closures) occurring at the input so programmed. Any input channel may be programmed for a Totalizer Function, up to a maximum of 8. Maximum Input pulse rate is 100 Hz, with a 50% Duty Cycle. The spoken scaled value will not "roll-over" to zero until a value of 4,294,967,294. has been exceeded.

Input/Output Expansion Capability:
4. The standard unit shall be modular in design, permitting it, therefore, to accept "plug-in" expansion circuit boards to incorporate any of the following:

** Contact Closure Expansion Capability to a total of 8, 16, 24, or 32 total dry contact inputs.
** Analog Input Capability to a total of 1, 4, 8, or 16 total analog inputs.
** Remote Supervisory Control Outputs to manipulate 4 or 8 output relays.

Modbus Communications:
5. The unit shall accept an expansion card which enables it to communicate directly with devices utilizing Modbus RTU Protocol. A unit so configured shall be capable of "reading" and "writing" to 32, 64, or 96 data registers via Touch Tone Telephone. No modem or host computer shall be required. Interface shall consist of a single RS-232 Serial Cable.

Printer/Computer Communications:
6. The unit shall be equipped with a centronics parallel printer port, enabling the user to print alarm reports, download programming data, and generate scheduled status reports as required. Alternatively, the unit shall be able to accept an optional modular, plug-in asychronous communications card to permit any of the following:

** Local Data Logging - Permits a single dialer to communicate with a local Serial printer to log routine status reports, alarm reports, and programming data.
** Central Data Logging - Permits one or more dialers to communicate with a single centrally located Serial printer equipped with a suitable modem to log routine status reports, alarm reports, and programming data.
** Data Acquisition and Control - Permits one or more dialers to communicate with a centrally located Computer/Printer System equipped with a SCADA software package, thereby functioning as a stand alone SCADA system.

Alarm and Inquiry Messages:
7. Upon initiating an alarm call, the system is to "speak" only those channels which are currently in "alarm status". Inquiry phone calls can be made directly to the unit at any time, for a complete status report.

Acknowledgement:
8. Alarms are acknowledged either by pressing a Touch Tone "9" as the call is being received, or by calling the unit back after having received an alarm call.

Nonvolatile Program Memory Retention:
9. User-entered programming and voice messages shall be kept intact, even during power failures or when all power has been removed, for up to ten (10) years. This shall be accomplished through inclusion in the system of a lithium battery separate from the unit's backup rechargeable gel cell battery.

Local and Remote Programming Capabilities:
10. The user may optionally elect to alter the following parameters from their standard normal default values via keyboard entry or remotely from any Touch Tone telephone.

** Alarm Response Delay: 0.1 to 999.9 seconds, with different delays being assignable to different alarms.
** Delay Between Alarm Call outs: 0.1 to 99.9 minutes.
** Alarm Reset Time: 0.1 to 99 hours, or "No Reset".
** Incoming Ring Response (Answer) Delay: 1 to 20 Rings.
** Number Of Message Repetitions: 1 to 20 Repetitions.
** Autocall Test: When enabled, the unit shall place a single round of test calls, both at the time this function is enabled, and also at regular subsequent intervals until this function is disabled.
** Remote System Microphone Activation.
** Remote Arming and Disarming of System.

Phone Line:
11. The dialer is to use a standard "dial-up" telephone line (direct leased line is not required), and is to be F.C.C. approved. Connection to the telephone is through a 4-pin modular jack (RJ 11).

Speakerphone:
12. The unit shall be capable of dialing any phone number on command and functioning as a speakerphone.

Real Time Clock:
13. The unit shall be equipped with a real time clock thereby making it possible to:

** Alarm Ready Schedule - The dialer shall be user programmable to follow a specific schedule of operations. This shall include the flexibility to set a weekday, weekend, and holiday schedule. With this feature the dialer shall arm and disarm itself according to the schedule programmed.
** In the event any of the printer configurations outlined in Section 6, are utilized, all alarm reports will be time and date stamped. Routine scheduled status reports can also be programmed.

Power/Battery Backup:
14. Normal power shall be 105-135 VAC, 15 watts nominal. The product is to contain its own gel cell rechargeable battery which is automatically kept charged when AC power is present. The system shall operate on battery power for a minimum of 20 continuous hours in the event of AC power failure. A shorter backup time shall not be acceptable. The built-m charger shall be precision voltage controlled, not a "trickle charger", in order to minimize recharge time and to maximize battery life available.

Integral Surge Protection:

15. All power, phone line, dry contact, and analog 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 line.

Technical/Customer Support:

16. All users shall be provided and/or shall have access to the following support resources.

** Each autodialer shall be shipped with a VHS Format Video Tape which details all features of the product and provides an in-depth step-by-step programming: guide. A superficial marketing overview will not be acceptable.

** A Fax-on-Demand System which allows any user to call the manufacturer and retrieve copies of all technical information available directly into his own fax system. This service shall be available on a 24 hour basis.

** 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 solved by either the Video Instruction Tape or the information provided via Fax-on-Demand.

Warranty:

17. The dialer shall be covered by a **FIVE (5) YEAR warranty covering parts and labor performed at the Factory.**

Additional Features: Sealed Switches. LED Indicators. Alarm Disable Warning. Talkthrough:

18. All keyboard and front panel switches shall be sealed to prevent contamination. Front panel LED's shall indicate: Normal Operation, Program Mode, Call in Progress, Status for each Channel, AC Power present, AC Power failure, and Low, Discharging, or Recharging Battery. On any inquiry telephone call, or On-Site status check, the voice shall provide specific warning if no dialout phone numbers are entered, or if the unit is in "alarm disabled" mode, or if AC power is off or has been off since last reset. A built-in microphone shall allow anyone at a remote site to listen to Local sounds and to have a two-way conversation with personnel at the dialer.

Miscellaneous Special Order Items:

19. The following options shall be available on specific order:

** Radio Communications Interface
** Various NEMA 4X (sealed) Enclosures
** Thermostatically Controlled Heater
** UL Approved Power Supply
** Cellularm Communications Systems

2 | Installation

This section describes how to install the Verbatim autodialer and how to install a parallel printer to use the Parallel Printer Local Data Logging feature.

2.1 | Location and Mounting

Choose a mounting location which is not exposed to condensing humidity or temperatures beyond the limits of 20°-130°F. This location should ideally be within 5 feet of a standard RJ-11 phone jack and a *grounded* 120 VAC power outlet.

1. Mount the Verbatim autodialer on centers of 6" x 11 3/8" using the external mounting ears on the enclosure. #10 or 3/16" bolt sizes are best.

2. Install the NEMA 4X weatherproof outer enclosure, (optional purchase).

   This allows the Verbatim autodialer to be mounted outdoors as long as temperature limits are not violated. It is best to provide at least an over-head shelter to minimize direct precipitation and solar heating effects.

3. Install the heater/thermostat for cold or humid environments, (optional purchase).

   The 120 VAC heater dissipates 75 watts, providing a temperature rise of approximately 30 degrees, or 60 degrees when enclosed in the optional NEMA 4X enclosure.

2.2 | Wiring

Refer to the diagram on page 2-3 for an example of the wiring connections.

1. Inspect and remove any foreign materials which might create short circuits.

2. Connect the red (positive) battery lead to the positive terminal on the gel-cell battery.

3. Plug the power cord into a *grounded* 120 VAC *outlet*.

   Or, remove the power cord from the Verbatim autodialer and install well-grounded 120 VAC power to terminal strip TS3, located on the lower right of the main circuit board.

If there are any green grounding wires in place on TS3 originating from plug-in expansion cards, leave those green grounding wires in place on the terminal marked GRN (Green). If the Verbatim autodialer turns on when power is applied, turn it off with the red POWER ON/OFF key.

4. Connect dry (unpowered) contacts to the terminal strip connection points.

   The connection point for basic four-channel units is terminal strip TS1, located on the lower left of the main circuit board. Note that there are four common return terminals marked "C"; any combination of these internally grounded terminals may be used. Terminal strip TS1 may be unplugged for convenience. All terminal points are screw clamp type, eliminating the need for wire termination lugs.

   The contact input wires should ideally be light (18 to 24 gauge) signal wire rather than heavy power wire. This reduces problems of bulk and stiffness.

5. If your unit has 8 or more inputs, the VX32 Channel Expansion Card should be plugged into connector J4.

   If your unit has this card installed, then use TS1 for common return connections only, and connect one side of each contact to the appropriately marked channel input number on the VX32 card. Leave TS1 terminals 1,2,3 and 4 disconnected.

Notes:

◆ The common *return* side of the contacts will need to be consolidated into not more than four wires coming into the TS1 terminals marked "C".

◆ Route the wires to the VX32 card so that they do not protrude above the top of the card, other wise they will interfere with the front panel board when the door is closed.

◆ Terminal strip TS1, and the terminal strips on the VX32 card if any, are not removable terminal blocks. Be sure that the terminal strips do not become unplugged due to wires being stressed when the door is closed.

Caution:

NO 120 VAC INPUT CIRCUITS! Please verify that the circuits you connect to these inputs are "dry" (unpowered) and are *not* directly connected to 120 VAC power. Connecting such circuits will damage the unit.

Exception:

If your inputs are coming from a logic controller with TTL, CMOS or 5-volt DC logic outputs, direct connection may be made as long as the controller has the same electrical ground as the Verbatim autodialer.

*Electrical Connection Diagram For Dry Contact Inputs*
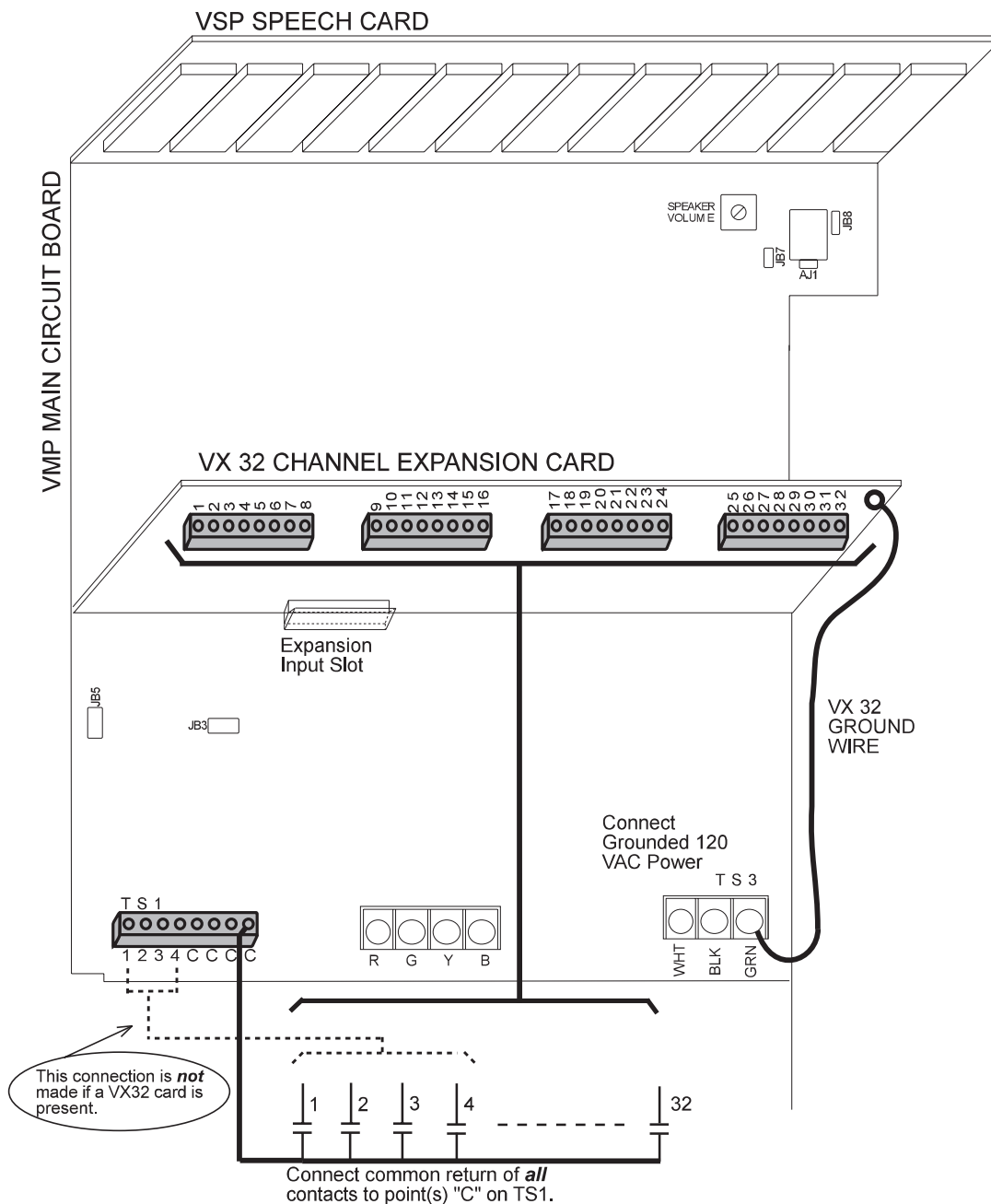
The common returns for all inputs are connected to TS1 terminals marked "C". These four "C" terminals are connected together and to electrical ground.

4 Channel Verbatim: Connect one side of each contact to the corresponding numbered terminals on TS1. The other side of each contact connects to the common return (the "C" terminals on TS1).

8 Or More Channel Verbatim: Connect one side of each contact to the corresponding numbered terminals on the VX32 expansion card. Connect the other side of each contact to the common return (the "C" terminals on TS1 of the main board). Note that TS1 terminals 1 through 4 are not used in this case.
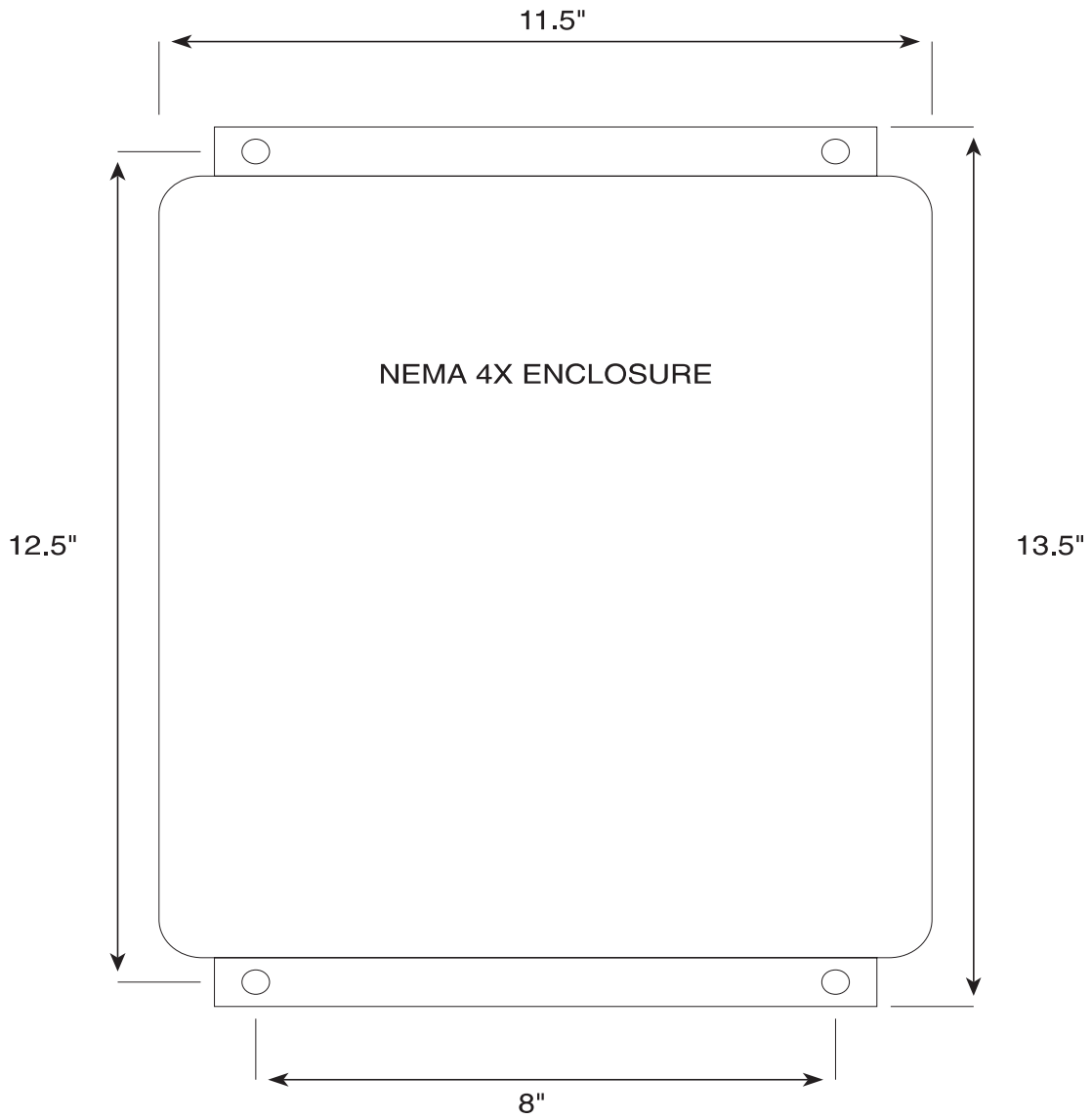
Verbatim Enclosure Diagram

re

6"

Verbatim

11-3/8"

11-7/8"

9-3/4"
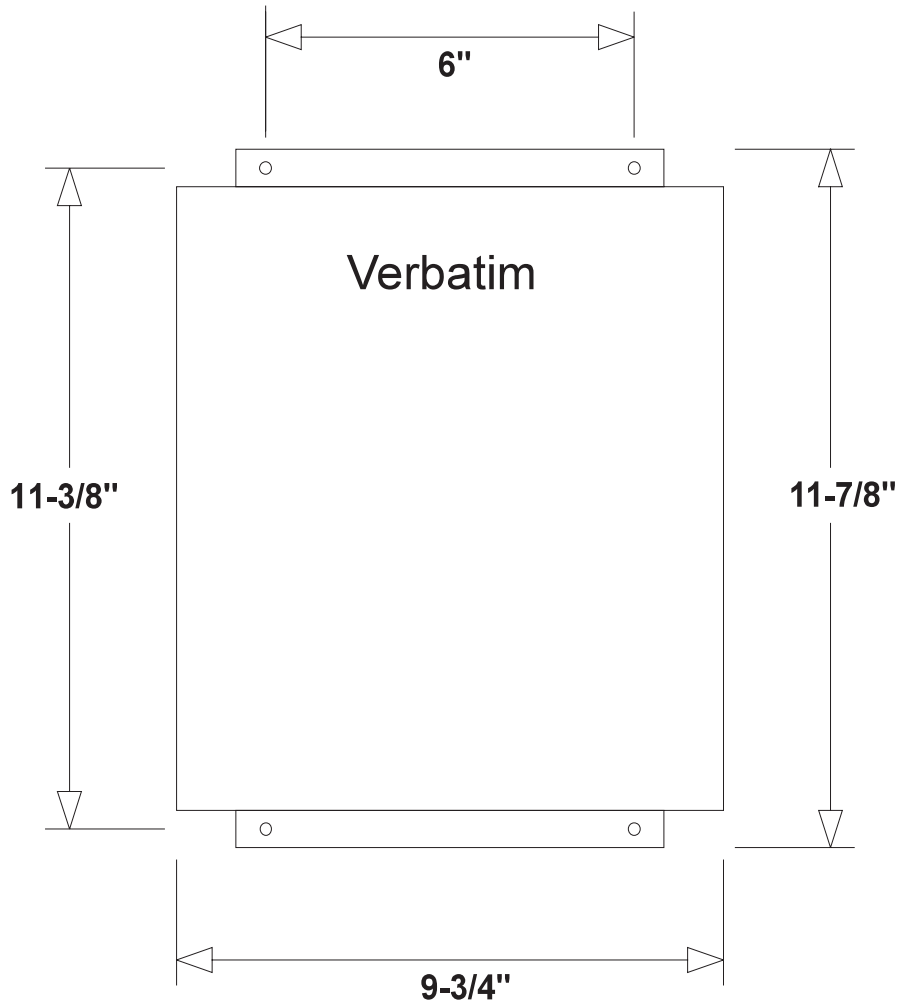
RECTANGULAR MOUNTING CENTERS: 6" W x 11-3/8" H
OVERALL DIMENSIONS: 9-3/4" W x 11 7/8" H x 5" D

NEMA 4X Enclosure Diagram

11.5"

NEMA 4X ENCLOSURE

12.5"

13.5"

8"

RECTANGULAR MOUNTING CENTERS: 8" W x 12.5" H
OVERALL DIMENSIONS 11.5" W x 13.5" H x 5.5" D