LCR 5000
Paging Load Control Receiver

The LCR 5000 combines reliable 900 MHz paging with Cannon Technologies' advanced load control features using ExpressCom® and VERSACOM™ technology. A single page can address one or more LCRs allowing control of loads in town or around the country simply and reliably.

Overview

The LCR 5000 is a breakthrough in load control communications. Because it embeds a control message in an actual page, a single pager ID is all that is necessary to control any number of LCRs. Therefore, the utility does not require a communication infrastructure for load control. FLEX® paging is available worldwide and messages are not limited to a utility's service territory. No special equipment or software is needed at the paging provider.

Features

The LCR 5000 includes the following features:

- Remotely programmable
- Locally programmable with a handheld computer
- Change paging carriers remotely or locally
- Group addresses remotely or locally reassignable
- Available with Brownout Protection
- Available with TrueCycle® for the optimization of air conditioner cycling

CANNON TECHNOLOGIES
Powered by Yukon®

Load Control Commands

The ExpressCom protocol uses variable length messages that combine powerful command capabilities with extremely high message efficiency. The ExpressCom command set offers maximum flexibility to meet virtually any control need, including delayed execution of load control commands.

Up to three loads are available per receiver. Each load relay is independently switched by three types of ExpressCom commands sent to any level of addressing:

- **Timed Control** – Controls loads for a user-specified time period, and then automatically restores. This command allows 1 to 255 minutes or hours of control with 1 to 255 minutes of beginning or ending ramp time to minimize the creation of new load peaks.
- **Cycling Control** – Initiates a sequence of control/restore cycles. This command allows for a cycle period of 1 to 255 minutes and 1 to 100% cycling control. LCRs automatically randomize initially, and then restore upon completion of a cycle count. Control percentages or periods may be changed in mid-cycle with a smooth transition into the new sequence.
- **Restore Control** – Used to cancel control on a load in an LCR. The command can also include a ramp out time.

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LCR 5000 Installation and Maintenance Features

Intelligent Cycling

TrueCycle allows intelligent air conditioner cycling control for homes with oversized AC units. This functionality requires optional hardware specified at the time of order.

TrueCycle adjusts to the home's hourly runtime profile, balancing demand reduction and customer comfort on a home-by-home, hour-by-hour basis.

Dual Paging Providers & Frequency Agility

Preprogram the LCR 5000 with channels from two paging providers. The unit will automatically scan for a signal on both.

The LCR is frequency agile, which gives the utility flexibility when selecting paging providers and paging frequencies.

Line Under Frequency Protection

The LCR 5000 can automatically shed a load connected to a 5A relay if the supply frequency drops below a configurable threshold.

Line Under Voltage Protection

The LCR 5000 can automatically shed a load connected to a 5A relay if the supply voltage drops below a configurable threshold.

Fail-Safe Operation

The condition of the receiver is continually monitored. If an abnormality is detected, the microprocessor resets and the loads are returned to their normal state.

Cold Load Pickup

To minimize feeder inrush following power outages, the LCR 5000 includes a cold load pickup feature that can be individually enabled or disabled for each load.

Load Control Counters

Counters for each relay can be configured to track control time or the number of relay activations. These may be reset individually by a remote command or by a handheld computer using LCR-Minder software.

IN/OUT of Service Commands

Service commands enable or disable receiver functions either by serial number or addressing group. Receivers may be deactivated with either a "Temporary" or "Permanent" setting. This feature improves customer service by reducing customer complaints and saves significant dollars by minimizing service calls.

LED Indicators

A green LED can indicate normal operation, communication loss, or logic diagnostic errors. The red LEDs (one per relay) can indicate a load is under control or a possible circuit fault. The infrared LEDs can transmit status data to and receive commands from a handheld computer loaded with LCR-Minder software.

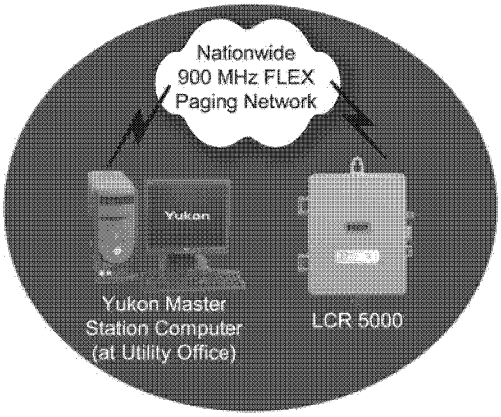
Integral Wiring Compartments

Separate wiring compartments with knock-outs are included for both NEC Class 1 and Class 2 connections. These eliminate the need for costly external junction boxes, reduce installation expense, and improve installation appearance.

Necessary Components

The following are all that is necessary for LCR 5000 load control communications:

- ❑ Computer with Cannon Technologies software or a subscription to Cannon Technologies' Applications Services over the Internet.
- ❑ LCR 5000
- ❑ Paging provider contracts



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SPECIFICATIONS

Communications

One-way communication over multiple public paging networks directly to the LCR using ExpressCom or VERSACOM protocols.

900 MHz Paging

- ❑ 900 MHz paging is faster, costs less, penetrates better, and has a nationwide coverage area in place
- ❑ Supports redundant paging providers; the paging providers can be remotely changed without a visit to the LCR
- ❑ Over-the-air (OTA) programming of addressing, plus individual control or override

Environment

Temperature:
-40°F to 185°F (-40°C to +85°C)

Relative Humidity:
0-95% non-condensing

Housing

NEMA 3R injection-molded, UV-stabilized gray polycarbonate plastic. Rain-tight per UL916.

Electronics

Per UL916. Transient voltage protection per ANSI C37.90A-1974.

Power Requirements

Voltage:
240 VAC (+10 -20%)
(24, 120, 208, 240, 277, and 408 VAC options)

Frequency:
60 Hz (±2%), 50 Hz (±2%)

Relay Control

Low Power:
5A at 120 VAC resistive, Form C

High Power:
30A at 240 VAC resistive, Form B

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COOPER Power Systems
Energy Automation Solutions

ComEd
An Exelon Company

CRC 00310 61

KeyAlert
Load Control Notification System

May, 2006

BACKGROUND

ComEd
An Exelon Company

CRC 0031062

- The KeyAlert Load Control Notification System was introduced to the public in 1991
- ComEd began to utilize the system in 1997
  - 1997 - 2001, Operations & Bulk Power owned the system
  - 2001 - 2004, Marketing assumed budget, installation & maintenance (However, ComEd - BPO retained control)
  - 2004, Marketing assumed complete system ownership/responsibility

Supporting Framework

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Software: Two versions have been introduced. Both versions are compatible with only the Windows 95 Operating System

- –V1.10 (1991 to 1999)
- –V1.20 (1999 to present)

Hardware:

- –Printer (internal modem)
- –Alarm Notification Unit (Light & Horn)
- –Relay Box (control sites)

SYSTEM DESIGN

ComEd
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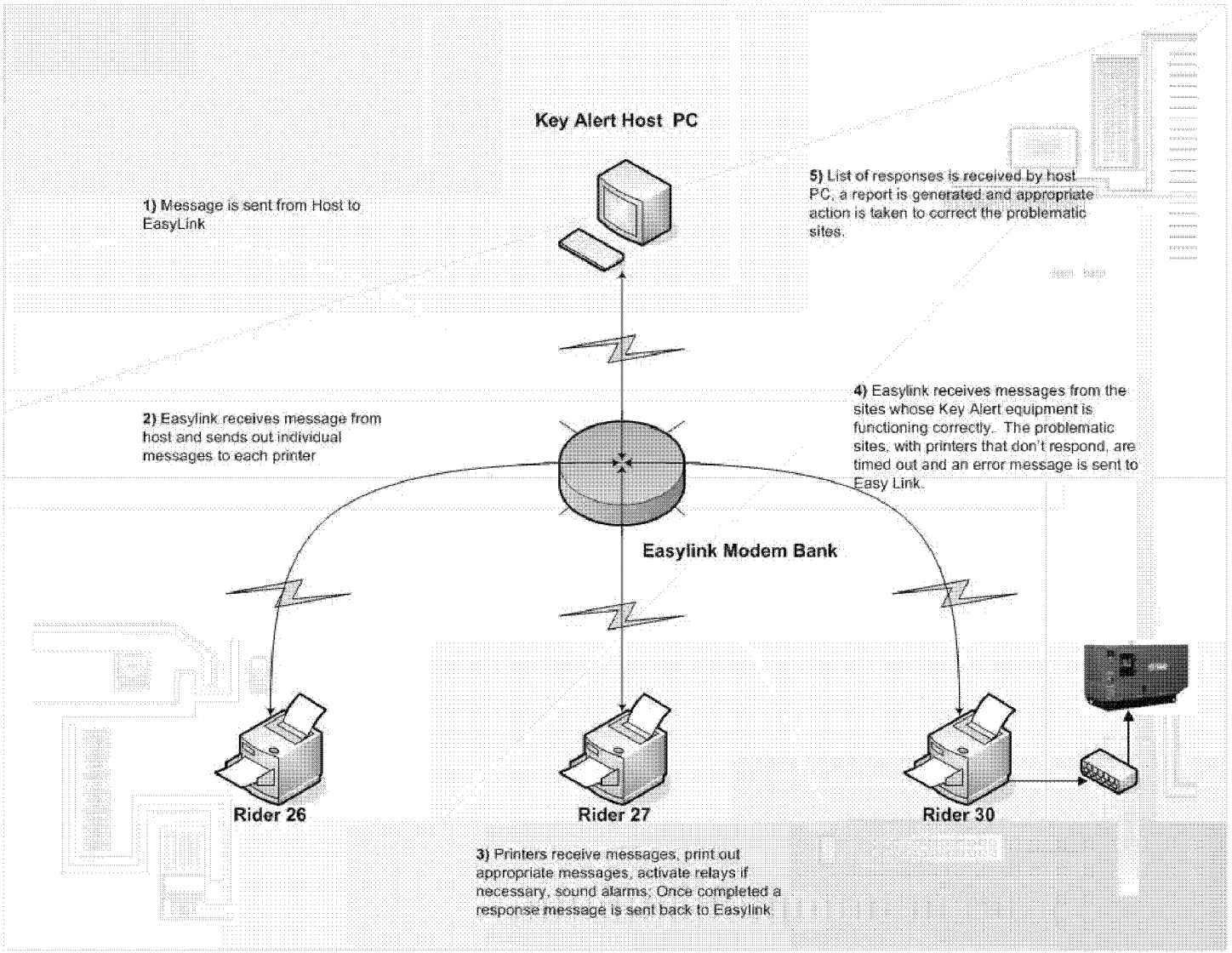

CRC 0031064

OPERATIONAL BASICS

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- ComEd currently has 163 KeyAlert printers in the field.

- Of this number, 102 sites are control sites
  - *Total Controllable Load: 91,231 kW*

	Printers	Relays	Controllable Load	Percentage of Total Load
Rider 26	52	44	44 mW	73%
Rider 27	26	4	9 mW	15%
Rider 30A	51	38	27 mW	92%
Rider 30B	21	3	5 mW	16%
Cub Foods	13	13	7 mW	100%