



CardSaver™ PrePaid IP Billing and IVR



Connect to all the International and Local Carriers without the need for dedicated leased lines. Provide Prepaid services with 60% less investment than the legacy technology.

About CardSaver 2006 Prepaid Software

For companies who offer or are planning to offer long distance service in the form of prepaid calling cards, post paid accounts, ANI/PIN based prepaid accounts, or ANI/PIN based post-paid accounts, the CardSaver software is the comprehensive package they are looking for.

PEC's pioneering staff has designed and developed a solution to give the user virtually limitless control over their system. CardSaver is an industry-leading, cost-effective, Windows-based software that connects to industry standard IP Gateways. The software runs on a standard Pentium-based system that supports the Windows XP operating system and the industry standard Remote Authentication Dial-In User Service (RADIUS) protocol. The RADIUS protocol is currently the de-facto standard for remote authentication, authorization and accounting.

The RADIUS (Remote Authentication Dial-In User Service) protocol has become the industry standard that is widely used for billing and other management applications to control network access. The process is often referred to as authentication, authorization and accounting (AAA). RADIUS provides standardized message formats for transmitting and receiving keypad input, account data, authorization codes and other information between access gateways (such as Cisco or the Tenor switch) and billing servers.

CardSaver is a truly complete turnkey software switch, offering all the necessary features demanded by today's carriers along with added features to propel them ahead of their competition. Pre-paid, post-paid, debit, and other easily modifiable features are all available for providing high-quality prepaid services.

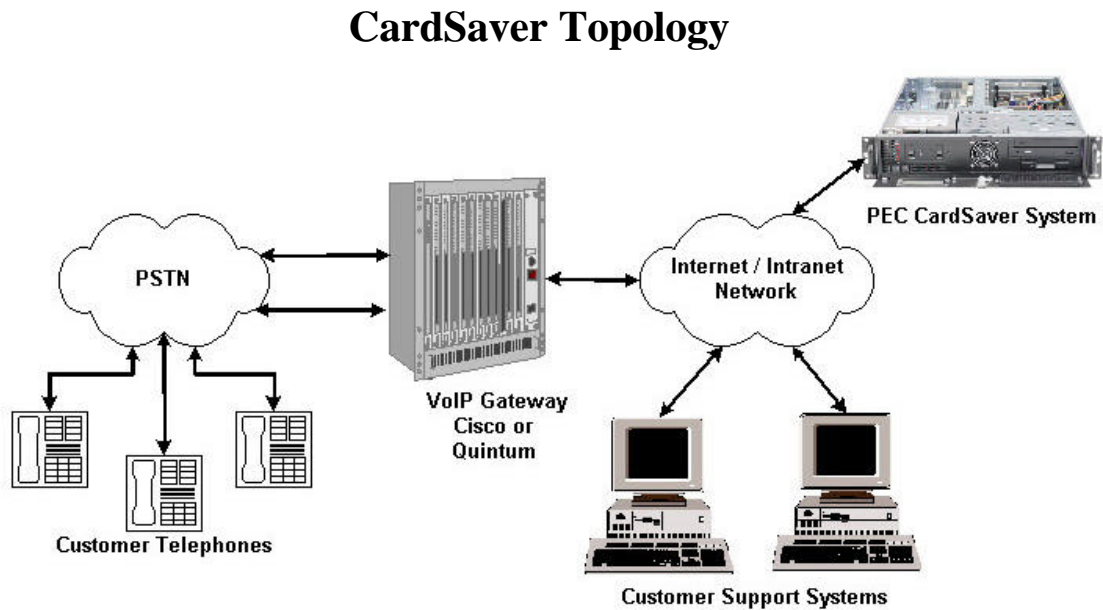
The CardSaver software may be managed from any Web Browser from anywhere in the world with security and ease-of-use that is unmatched in the industry. This flexible management interface enhances the carrier's ability to stay ahead of the market by being able to make immediate updates and changes to the system.

CardSaver offers the same flexibility and convenience to end-customers that it provides to carriers. The customers have full access to view and update their account information and account balance online through any browser, from any Internet connection in the world.

Hardware Configuration

CardSaver runs on a computer that connects to an IP/PSTN gateway with IVR support. Cisco or Tenor Gateways are used to support the IVR connection. The IVR interface enables the system to relay and/or play voice messages to customers, prompting them to input numeric information using their phone keypad. This information can include the caller's account number, PIN, and the number the caller wishes to reach. The numbers that the caller enters can therefore be transmitted by the Gateway in RADIUS format over the IP network to the CardSaver RADIUS compliant server. The server can then use the inputted data to identify the customer, verify their identity using the PIN code, check the account status, and send back messages in RADIUS format, instructing the Tenor switch whether or not to proceed with the call.

The following diagram shows how the CardSaver system fits in the telephone environment:



When the call is made, the PSTN routes the call to the VoIP Gateway. The VoIP Gateway sends a RADIUS packet to the CardSaver system, and based on the number dialed, the CardSaver asks the caller to enter the desired long distance destination number and instructs the VoIP Gateway to transfer the call. CardSaver then informs the caller of the amount of credit left on the account. CardSaver calculates this amount by using a rate table created by the administrator of the system. The connection between the caller and the dialed number is then made. Once the call is disconnected, the VoIP Gateway sends a RADIUS packet to the CardSaver system informing that the call has been disconnected. The CardSaver system then deducts the appropriate amount from the caller's account balance.

The Radius Server

The PEC Radius Server is shown below. For each session, the Radius Server logs the start and end times, the account number, the origin of the call (ANI or Caller ID), the dialed number (DNIS), the duration of the call, the amount of credits used for the call.

PEC Radius Server ... _ X

Server Settings	Session	Account	Caller ID	DNIS	Status	Credit	Minutes
Web Admin Portal	33656532 35...	461936564251	3052384638	17188490796	Call started at 21:31:32	3.09	153
Restart Server	33656532 35...	460639748845	3052323253	18763518050	Call started at 21:43:00	4.69	36
Shutdown Server	33656532 35...	374496922812	9549460461	5092683453	Call started at 21:39:40	5.00	60
Busy Out >>	33656532 35...	182515000986	3055474630	5027165083	Call started at 21:47:06	3.89	36
Start Logging >>	33656532 35...	203469684954	9547840757	18099401957	Call started at 21:38:16	4.63	75
	33656532 35...	114458425654	9542341642	18769027261	Call started at 21:41:05	4.50	81
	33656532 35...	259322278483	9549896429	62341451067	Call started at 21:48:14	5.00	33
	33656532 35...	314480670764	3057587677	88029005923	Call started at 21:54:29	4.62	93
	33656532 35...	111895554347	3053789609	88063162270	Call started at 21:46:07	8.94	53
	33656532 35...	152800904953	9546676534	88027511497	Call started at 21:52:00	9.88	158
	33656532 35...	375402109922	9549417976	18768519802	Call started at 21:54:46	5.00	90
	33656532 35...	240437791192	9547311041	17186758032	Call started at 21:40:36	3.38	237
	33656531 64...	481450597338	9549904902	18763651838	Call started at 12:36:09	5.00	60
	33656532 36...	049114141376		4597592600	Call started at 12:40:45	2.76	2
	33656531 64...	981690730348	404	496154624057	Call started at 12:37:06	10.00	198
	33656531 64...	250431283806	9549427999	5095124313	Call started at 12:35:31	3.33	39
	33656532 36...	008185814167		442082135625	Call started at 12:39:04	5.00	64
	33656531 64...	978600389275	7325539260	33380664739	Call started at 12:26:50	7.89	156
	33656531 64...	359566011580	3052595571	88028023103	Call started at 12:38:08	1.83	22

06/07/03 21:19:31: CDR RECORD (216.226.211.158): => 18004171000 [31 sec]

06/07/03 21:39:52: CDR RECORD (198.79.3.130): 9542341642 => 3054162550 [15 sec]

06/07/03 21:53:25: CDR RECORD (198.79.3.130): 9549624377 => 3054162550 [44 sec]

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CardSaver 2000 Features:

Web-based Management Interface

- Manage the CardSaver switch with any web browser from anywhere in the world.

DNIS based Applications

- Customized Voice Prompts based on called number.
- Multiple Language Support

Customized Messages

- Dollar/Minutes remaining in your card.

Warning Messages

- Messages to callers in the middle of the call

Multiple Destination Calls

Multiple Card Types

- Card types with different rates for different dealers.

Multiple Language Support

- Support up to 4 languages

Local and 800 Numbers Support

- Receive calls from local or Remote areas through 800 numbers

Payphone Calls Support

- Detect calls from Payphones and Add surcharge

Operator Support

- Instructions on how to use a calling card.

Local Access Support

- Call from the local area number
- Telephone Directory/Ask the store owner

Call Data Record (CDR)

- Call detail record logging
- Card re-charge
- Re-charge PIN using credit cards

Usage Fee Charging

- Charging usage fees after first use.

Multiple Rate Tables

- Rates set up based on the area calling.

Time Sensitive Rate

- Rates setup based on the time of day.

Least Cost Routing

- Route call based on which will be the most cost efficient.

Fraud Control

- ANI blocking for number of bad attempts.

Call Blocking for no ANI Calls

- PIN instance use limitation
- Destination blocking by NPA/NXX.

Billing System

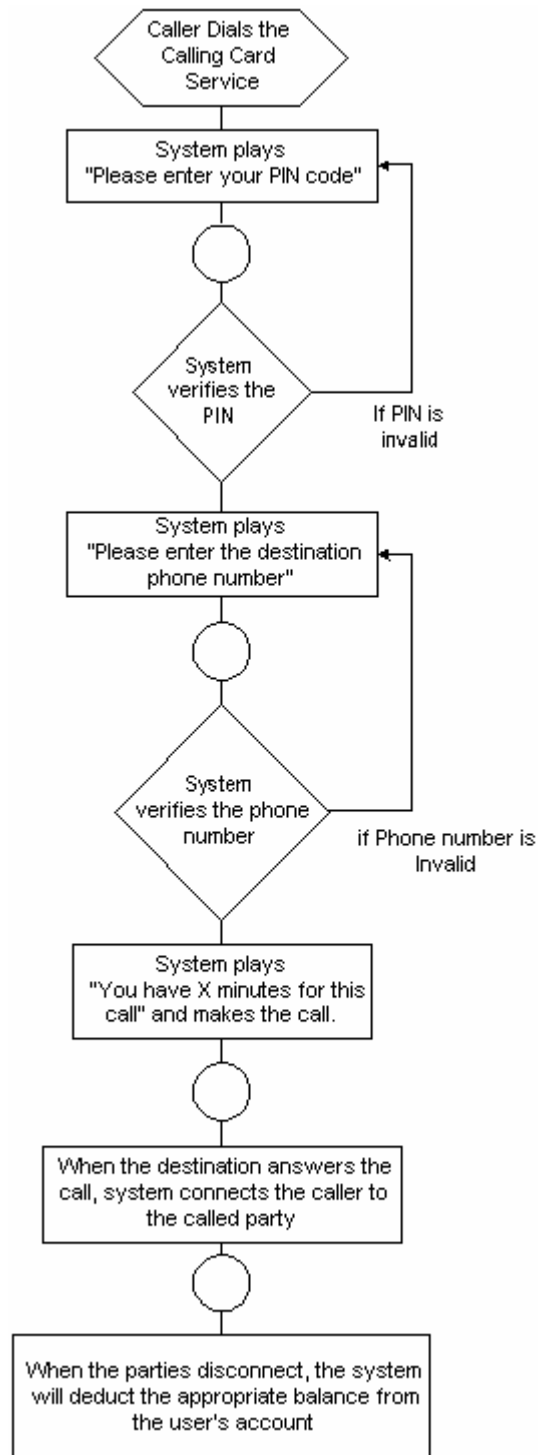
- Billing Reports
- Management reports
- Operational reports

Administration Tools

- Review PIN/CDR information
- Add/Edit/Delete
- PIN, Access Numbers, Card Type Information
- Domestic/International
- PIN Generator
- Generate random PIN numbers

Call Flow

The typical pre-paid calling card flow is depicted in the flow chart below:



PSTN Tones and Definitions

CardSaver responds to the following telephone **Network Tones**:

- **Busy Tone**: An extension, network, or trunk busy tone has been detected.
- **Call Progress Tone Detection**: The ability to detect network tones allows an application to place a call and monitor its progress. Many tones can be detected.
- **Connection**: The call has been answered.
- **Detect a Human Voice**: Recognizes when a person, and not an answering machine or other device, answers a call.
- **Detect an Answering Machine**: Recognizes when a call is answered by an answering machine.
- **Dial Tone**: Host telephone systems, local, or international dial tone has been detected.
- **Disconnect Supervision Tones**: Recognize when a call is disconnected- Recognizes a disconnected signal sent by the network central office or by a host telephone network.
- **Fax Machine Tone**: Fax machine tone has been detected.
- **Modem Tone**: Modem tone has been detected.
- **No Answer**: The call has not been answered.
- **Operator Intercept**: Operator messages, including “line not in service” messages, can also be detected.
- **R2 MF Tones**: Multi-frequency tones used for network signaling and to send information about the called and calling subscriber’s lines such as Automatic Number Identification (ANI).
- **Ringling**: Ring back has been detected.
- **Special Intercept Tones (SIT)**: An invalid number was dialed or there was a problem completing the call.

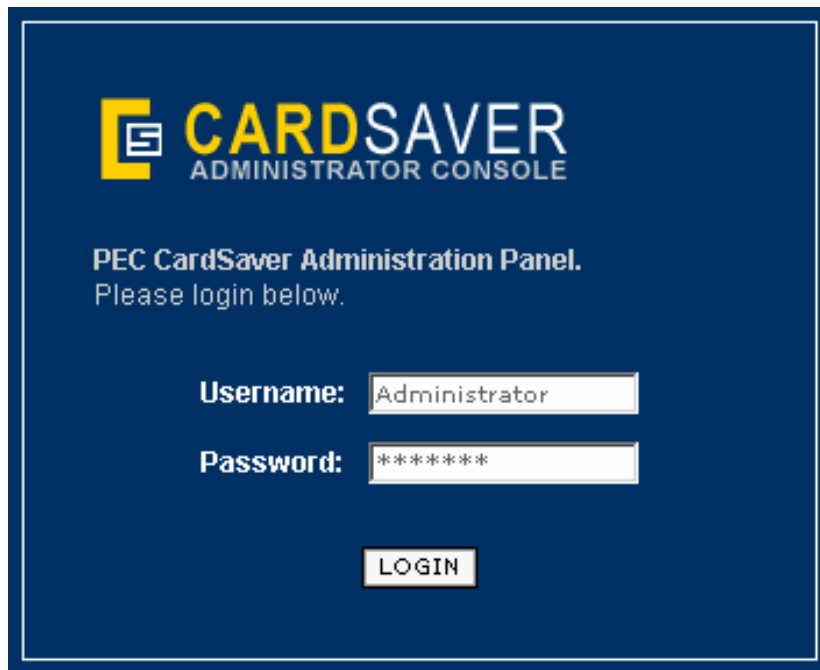
The CardSaver Web Interface

System Accessibility

Your CardSaver system can be accessed from any web browser, from anywhere in the world. The CardSaver Web interface has been designed to provide quick and simple functionality to allow effective navigability for all system users.

System Security

The CardSaver interface has also been designed with security in mind. A secure login system provides security to ensure that no unauthorized users will be able to access your CardSaver system. Below is the initial login screen to the CardSaver Administration Panel.



CARDSAVER
ADMINISTRATOR CONSOLE

PEC CardSaver Administration Panel.
Please login below.

Username: Administrator

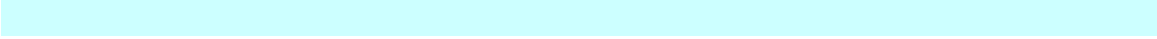
Password: *****

LOGIN

User Types

There are four unique login types that can access the CardSaver Administration Panel: **Administrator**, **Agent (Reseller or Distributor)**, **Card Account Holder (End-user)**, and **Customer Service Representative**.

- **Administrator:** This is the system administrator. The Administrators have full access to the CardSaver system. Administrators have permission to modify the Agent, Card, Access Number, and Rate Table databases for all users of the system. They can also modify the user interface for all users.
- **Agent:** This is the card distributor or reseller that is responsible for distributing the card. Agents have limited access to the CardSaver system. Agents have permission to view reports and statistics on all card accounts assigned to them in the Card Table. Agents do not have permission to modify the Card Table or credit accounts.

- **Account Holder:** This is the card end-user. The Account Holder has limited access to the CardSaver system. Account holders have permission to view reports on all call details pertaining to their own account, including the durations and costs of calls. The Account Holder also has the ability to recharge his account with a credit card or electronic check via the web interface.
 - **Customer Service:** This is the login for the Administrator's Customer Service Representative. The Customer Service Rep can settle disputes by viewing detailed call information and determining whether or not to issue credit to cardholders. Each Customer Service Rep is allowed to issue credit up to the amount specified by the Administrator. Customer Service
- 

Administrator Agent Management

After logging in as an Administrator, selecting “**Manage Agent**” from the system menu will access the CardSaver Agent Management system. The Agent Management system allows Administrators to easily add and remove users, manage user permissions, modify specific user information, and view agent account statistics.

The Agent Table is shown below. It contains all Administrators, Agents, and Account Holders that have access to the CardSaver system.

MANAGE AGENT	Agent Name	Authorization Level	Status
View Agents	GambiaTel	CARDHOLDER	Active
Add Agent	Admin	SYSTEM ADMIN	Active
View Agent Trunks	Sal	SYSTEM ADMIN	Active
Add Agent Trunk	Jimmy	CUSTOMER SERVICE	Active
Recalculate Agent Costs	Patel Brothers	AGENT	Active
View Agent Accounts	Dominica	AGENT	Active
View End Points	JBrown	AGENT	Active
Add End Point	GVaughn	AGENT	Active
	NigeriaCards	AGENT	Active
	agentdemo	AGENT	Active
	BillDavis	AGENT	Disabled
	RSilverman	AGENT	Active
	BestUSA	AGENT	Active

The Rate Table

The Rate Table is a database table that provides cost information for many different carriers and many different rate plans per carrier. The rate table also gives you the ability to bill differently for calls made during day, evening, night, and late night time periods and lets you charge different rates for weekends and holidays.

You may view the list of Rate Tables from the Administrator's Screen by selecting "**Rate Tables**" and then "**View Rate Tables.**" The example below contains six rate tables, but you may add as many as you wish.

RATE TABLES		Rate Table Number	Rate Table Name
View Rate Tables		1	USA Domestic
Add Rate Table		2	Dominica
Copy Rate Table		3	UK 5c per min
Edit Rate Table		4	Special American Travel
		5	Prudential Employees
		6	University of Maryland
		100	General Rates

By selecting a particular Rate Table Number, CardSaver will display the details of that specific table. The following screen shows the data for Rate Table Number 4, Special American Travel.

Prefix (Starting Phone # Pattern)	Description	BILLING PERIOD LENGTH		DAYTIME HOURS			EVENING HOURS			NIGHT HOURS		
		Initial Length	Incremental Length	Start Time	Initial Charge	Incremental Charge	Start Time	Initial Charge	Incremental Charge	Start Time	Initial Charge	Incremental Charge
1732%	RestofAmerica	60 sec	60 sec	7:00	500	500	13:00	500	500	21:00	500	500
1800%	800Numbers	60 sec	60 sec	7:00	500	500	14:00	500	500	21:00	500	500
44%	England	60 sec	60 sec	7:00	500	500	14:00	500	500	21:00	500	500
%	Default	60 sec	60 sec	7:00	500	500	14:00	500	500	21:00	500	500
51%	PERU	60 sec	60 sec	7:00	500	500	14:00	500	500	21:00	500	500
91%	India	60 sec	60 sec	7:00	500	500	14:00	500	500	21:00	500	500
1767%	Dominica	60 sec	60 sec	7:00	500	500	14:00	500	500	21:00	500	500

Import File Name

As an example, in the case above, if a caller wishes to dial "1-732-566-8800" during the specified Evening Hours (13:00 to 21:00), CardSaver will accept the transaction, and the caller will be charged 70 cents for the first 60 seconds and 5 cents for each additional 60 seconds.

The Card Database

By selecting “**Card Accounts**” from the side menu, you can access the Calling Card Database. This Calling Card Database is a database that provides information on any specific calling card. Specifically, you are able to see the date on which card was first used, the card’s current status (disabled or active), the used-value of the card, the type of card, the expiration date on the card, etc.

As an Administrator, you may see the entire list of Accounts or Cards. The following screen shows a sample of the cards in the database:

SerialNo	PIN	GroupID	BatchNo	Owner	Rate Table	Type	Expiration	Value	Status	Used	Details
101000	340586501874	123	100	BillDavis	UK 5c per min	PrePaid	12/05/2003	45.0000	0	.0000	Invoice Calls
101001	291287113407	123	100	Dominica	UK 5c per min	PrePaid	12/05/2003	45.0000	0	.0000	Invoice Calls
101110	3456	11122	73	JBrown	UK 5c per min	PrePaid	01/12/2004	30.0000	0	.3000	Invoice Calls
101491	000794078691	11122	76	NigeriaCards	UK 5c per min	PrePaid	01/12/2004	30.0000	0	.0000	Invoice Calls
101621	001580480206	11122	78	RSilverman	UK 5c per min	PrePaid	01/12/2004	30.0000	0	.0500	Invoice Calls
101622	12345	134	0	BestUSA	Dominica	PrePaid	12/01/2005	30.0000	0	.0900	Invoice Calls
10000002	3003850168	0	0		USA Domestic	PrePaid		.0000	0	.0000	Invoice Calls
10000003	62231332718200	122	200		Special American Travel	PrePaid	12/31/2004	10.0000	0	.0000	Invoice Calls
10000004	12230316481625	122	200		Special American Travel	PrePaid	12/31/2004	10.0000	0	.0000	Invoice Calls
10000005	72231436145285	122	200		Special American Travel	PrePaid	12/31/2004	10.0000	0	.0000	Invoice Calls

Previous 1-10 of 534 Next

By selecting “**Invoice**,” on the far right, you can generate an invoice for an agent for a specific calling card account. This invoice includes a detailed list of all the calls this cardholder has made within a specific billing period. The invoice is shown below for the card with serial number 101110.

PEC CardSaver Invoice						Back	Save	Email	Print	Date: 07/02/2003
Vendor	Serial No	PIN	Invoice Number	Billing Period						
JBrown	101110	3456	JBrown-101110-1057166988							
Vendor Info										
Company		Address								
Brown Enterprises		45 East Hanover Dr., Matawan, New Jersey, 07747, USA								
		Phone: 732-290-1000, Email: jbrown@brownent.com								
Call Detail Summary										
Caller ID	Destination	Connect Time	Disconnect Time	Minutes	Amount					
	7325551212	04/09/2003 16:50:38	04/09/2003 16:50:53	1:00	0.05 U.S. Dollars					
	17325551212	04/09/2003 16:51:21	04/09/2003 16:51:33	1:00	0.05 U.S. Dollars					
	17325551212	04/09/2003 16:51:58	04/09/2003 16:52:04	1:00	0.05 U.S. Dollars					
	17325551212	04/09/2003 16:52:24	04/09/2003 16:52:31	1:00	0.05 U.S. Dollars					
	17325551212E	04/09/2003 16:53:00	04/09/2003 16:53:11	1:00	0.05 U.S. Dollars					
	173255551212	04/09/2003 16:53:35	04/09/2003 16:53:42	1:00	0.05 U.S. Dollars					
Subtotal	6 Calls			6:00	0.3 U.S. Dollars					

To view the details about a specific card account, click on the serial number. For serial number 101110, the following details appear:

VIEW CALL RECORD	
Serial Number (Unique Number used to Identify Card,Note: Different than PIN Number)	<input type="text" value="101110"/>
Card Number (PIN Number used by Customer to Place Call)	<input type="text" value="3456"/>
Rate Table (Per Minute Rates To Charge Customers)	<input type="text" value="UK 5c per min"/>
Card Type (Type of Card Account)	<input type="text" value="PrePaid"/>
Passcode (Home): Only Valid From Home with use of ANI Prepaid	<input type="text"/>
Passcode (Away): Only Valid From Away with use of ANI Prepaid	<input type="text" value="9980"/>
Expiration Date (MM/DD/YYYY)	<input type="text" value="01/12/2004"/>
Card Value (Value of the card, in dollars e.g. 10)	<input type="text" value="30.0000"/>
Units (Value of the Card, in units, (100 units = 1 cent) e.g. 100000)	<input type="text" value="300000"/>
Sync ID (also called Group ID: Identifies the Group of cards produced e.g. 1234)	<input type="text" value="11122"/>
Batch Number (3or4 Digit Integer: Identifies Batch within SyncID(Group), e.g 100)	<input type="text" value="73"/>
Disabled (Yes/No): Disabled makes card unusable	<input type="text" value="No"/>
Disabled Date (MM/DD/YYYY)	<input type="text"/>
Used up Value (in dollars)	<input type="text" value=".3000"/>
Used up Units (used value in units, 100 units = 1 cent)	<input type="text" value="3000"/>
First Used Date: Date Card was first Used (MM/DD/YYYY)	<input type="text" value="04/09/2003"/>
Last Used Date: Last Date Card was used (MM/DD/YYYY)	<input type="text" value="04/09/2003"/>
Last Maintenance Date: Last Time Maintenance Charges were applied (MM/DD/YYYY)	<input type="text"/>
Activation Fee: Fee to charge first time used (in units, 100 units = 1 cent)	<input type="text" value="0"/>
Disconnect Fee: Percentage of minutes (in percent 0 to 50)	<input type="text" value="0"/>
Maintenance Fee: Amount to charge for Maintenance every 30 days(in dollars, e.g. 1.00)	<input type="text" value="0"/>
Language (e.g. English)	<input type="text" value="English"/>
Currency Used (e.g. USD)	<input type="text" value="U.S. Dollars"/>
In Use (Is the card busy at this time?)(Yes/No)	<input type="text" value="No"/>
Card Owner (Agent's UserName Responsible for Card)	<input type="text" value="JBrown"/>

Access Numbers

By selecting “**Access Numbers**” from the side menu, you can access the Access Number Database. This Access Number Database is the database that contains all of the valid access phone numbers. Only Administrators have permission to add and remove access numbers from the database.

The **Access Type** determines whether or not the access number is set to pre-paid, ANI pre-paid, post-paid, or ANI post-paid.

ACCESS NUMBERS	Access Phone Number	Access Type	Cards Group IDs
View Access Numbers	18004567890	2	150
Add Access Number	18889259000	99	250
	18667245000	2	350
	17325367500	99	251
	12013501000	2	252
	19544502560	99	351

ANI Based Processing

When utilizing the Prepaid ANI (Automatic Number Identification) based processing feature you can offer access to a customer without the customer having the hassle of remembering numerous PIN numbers. When the call is made from a number that has been registered with our CardSaver software, CardSaver receives the ANI information from the user’s central office. This information includes such identification as the phone number of the dialer and the name that the phone number is registered to, essentially a form of Caller-ID. When the number is sent to our system it will then search a database of “trusted numbers”. Should the number calling be one of the trusted numbers, CardSaver can apply special rules for this call. One of the most appealing features of this process is the ability to dial out without having to remember a long string of numbers.

Of course when customers have ANI based processing they will also have calling cards in case they are calling from another location. The card will charge to the same account whether the call is made from the registered ANI number or another called from anywhere else in the world.

Pre-Paid ANI Processing

In the case of Pre-paid accounts, the customer has the convenience of online account status. The customer has the ability to check the number of calls made, what calls were made, the duration, the expense, and many more options. The account holder also has the ability to change passwords. This saves time and money!

Benefits that can be offered to prepaid users

- Easy access to long distance facility anytime, anywhere
- Easy recharging of cards
- Low financial commitment
- No fear of misuse of long distance calling facility
- Control on expenses

- Complete account control via the World Wide Web

Employees

- ANI information for different offices could be used to eliminate the time consuming effort of entering numbers every time they make a call.

Cooperate

- Galvanization to the organization process
- Track on the type of calls, duration of calls, and other options of the calls made by the employees
- Track on cash outflows
- Usage benefits

Features

- Flexible integrated billing system installed at central server, thereby, generates all billing details for all users.
- Database Management
- Multi-lingual prompts, giving option to the user of choosing any language
- Card renewal through vouchers using IVR
- Balance details of the user
- Rating in different currencies
- Special rating methods
- Card activation and expiration schemes
- Service access codes
- Restricted calling times and numbers
- Recurring charges
- Call routing capabilities.

Postpaid ANI Based Processing:

When combining ANI based billing with a postpaid calling card you can then offer the customer complete hassle free long distance calling. In this case there will never be a time when the card needs to be charged in the middle of a call. Every call that is made will be charged to a bill that can be mailed to user monthly or taken directly out of a credit card after a set increment of time or by usage of credit. This type of service appeals to the end-user significantly since they now can use your service as naturally as they would the telephone services that they have grown accustomed to.

From the customer's standpoint, Post-Paid calling cards have slightly higher rates than prepaid calling cards, but the connection fees and billing increments are much less. Also, they pay only for the minutes used; there are no expiration dates on their minutes since they will pay for them after being used.

Postpaid calling card services also offer subscribers ongoing access to the long distance network. As with prepaid calling cards, the postpaid service is often hosted by a wholesale carrier to improve profitability. The main difference between prepaid and postpaid calling card services is that service authorizations under the postpaid model are not tied to call rating and services do not expire, except in the case of a limited-credit postpaid service. Since call rating does not happen in real time, more pricing schemes and bundling options are feasible. Wholesalers bill their carrier customers after calls have been made and the carriers in turn bill their end users.

When using Postpaid calling:

- Local access numbers (if available) will cut your rate in half.
- Online billing. This will allow you to make changes to your account through the Internet.
- International origination, so you can call home when you go on vacation outside your country

Benefits to Postpaid user:

- Completely effortless long distance calling.
- Competitive Rates.
- Conference Calling - up to 5 lines per conference.
- Speed Dialing - up to 25 Speed Dial codes.
- Fax Back Information - Receive a fax of latest rates, international access numbers, and dialing instructions.

Call Data Record (CDR):

The Call Data Record provides the most in-depth information about the calls that have been made from a single point of presence.

This information is sent over the Internet from the PSTN access provider to the Card Saver server and stored locally in a file. These text files are then saved daily and named accordingly. When Card Saver reads the data file it can generate customer statistics based on issues such as: Call time elapsed, Numbers called, Average call time, rate table used, expense, etc...

This information can then be made to generate call statistics every day at the end of the day and save the report to file or send it via e-mail to a supervisor or end-user. The information can then be stored locally for as long as desired so that statistics from one day, month, or year can be compared to show elapsed business growth.

International Carrier Report:

The International Carriers are responsible for maintaining the link between a point in the U.S. and a destination in a foreign country. They handle the connectivity issues with the local carrier in the foreign country and they deal with the people who provide the physical facilities to connect one country to another.

Generally the services provided by the International Carriers are accessed through a T1 circuit or IP. The PEC CardSaver platform may use the IP interface or the PSTN E1/T1 link to connect to the International Carrier. Before the PEC equipment can use the services, it must have the static IP for the carrier. The PEC equipment maintains the time it uses for the carrier. The information that the international carrier report generates is pulled from the Call Data Record (CDR) by only extracting the international calls.

In order for the carrier to know how many minutes it is using, the carrier may access the PEC administration system through the Internet or use the IVR.

IVR is a telephony technology in which someone uses a touch-tone telephone to interact with a database to acquire information from or enter data into the database. IVR technology does not require human interaction over the telephone as the user's interaction with the database is predetermined by what the IVR system will allow the user access to. For example, banks and credit card companies use IVR systems so that their customers can receive up to date account information instantly and easily without having to speak directly to a person. IVR technology is also used to gather information, as in the case of telephone surveys in which the user

is prompted to answer questions by pushing the numbers on a touch-tone telephone.

To use the IVR, the IVR application provides pre-recorded voice responses for appropriate situations, keypad signal logic, and access to relevant data, and potentially the ability to record voice input for later handling. Using Computer Telephony Integration (CTI), IVR applications can hand off a call to a person who can view data related to the caller at a display

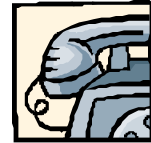
Dealer Report

A dealer has the responsibility of distributing prepaid calling cards or prepaid services in the market. CardSaver maintains information on the use of the minutes and separated by dealer.

There will be several ways for the Dealer Report to be accessed by the dealer remotely. The first method will read back the amount of minutes and other desired information after entering in a PIN number over the phone. Another method of remotely providing information that is on the system would be by using email. At a certain time everyday the system can send an email with the preferred statistics to a desired address. These two features allow the dealer to be fully aware of how the system is running from anywhere in the world at all times. Another would be to go onto the CardSaver server through the Internet and receive all the information desired.

Accounting Information Access From the Phone:

Customers can access accounts from any telephone in the world or via the Internet. Intuitive, voice-prompted menus guide customers through all stages of account validation, service usage and balance recharge. The menu is a completely interactive interface lessening the need to talk to a live representative.



Multiple service requests can be processed during a single call session, conserving both the customer's time and system resources. The most convenient and productive way to access the account would be over the Internet. This allows for the visual perspective and gives the customer a sense of control.

Customer Support Call Processing:

PEC is absolutely dedicated to the successful launch of your billing solution. To each of our customers, we assign an experienced program manager who supervises a cross-discipline team, highly skilled in business planning, installation and implementation, service development, and service rollout. We will, as a team, work with your account so that when it is completely implemented it will be a smooth problem-free process striving for 100% customer satisfaction.



Credit to Customers and Complaint Handling

For any complaints on the calling card, the cardholder is able to check all of the records on the card in the Call Record for Customer Support, by going online and filling out a complaint form. This database records the phone numbers the caller called, date/time of calls made, duration of the call, memory on the card, card's hardware and software, what kind of card the caller holds, where the calls were made from, where the call destination is, etc. The record of the card is based on the cards PIN. This database gives the cardholder the ability to check his or her card record.

Handling disputes from International Carrier

The Card Saver Platform keeps detailed logs of all calls including call duration, caller ID of the person

accessing the system, call destination, and many more details about the calls. Using the information that our software logs, and organizes in such a way that makes finding the information that you want it the simplest possible, handling any kind of disputes from international carriers.

Detecting Abuse and Fraud

Customer fraud can take the form of customers trying multiple combinations of username and password. In the PEC system the Username is usually your phone number or the cards PIN number. The username's password can be up to 4-10 characters, numbers only. The random generation should prevent most such fraud. Simultaneous calling is another form of fraud, whereby more than one user uses the same Username and Password at the same time. Simultaneous calling is blocked in the PEC system. Only one session can be online per card Username.

CardSaver also has the added option of being able to:

- Block calls from specific regions and individual phone numbers.
- Use ANI blocking for number of bad attempts.

The Calling Card Generator

The Calling Card Generator is used to create batches of calling card numbers that have the same characteristics. Each batch can have unique characteristics, such as fees, value, expiration date, etc. Card numbers are generated randomly using a configurable pattern that can contain up to 10 digits. The program creates unique numbers (PIN), each which is verified in the database to ensure that it is unique. Each card is also assigned a unique serial number.

PINs are generated by batch, and each PIN within a batch will have the attributes of that batch, these characteristics are:

- Batch number
- Number of PIN generated for that batch
- PIN pattern
- Card value *
- Initial fee *
- Periodic fee and period length in days *
- International rate tables *
- National rate tables *
- Number of card's valid days *
- Absolute expiration date *

*Can be modified after creation

The numbers generated are added to the system's Card Database.

IP Link Technical Specifications:

The Internet Protocol (IP) is the method or protocol by which data is sent from one computer to another on the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet. When you send or receive data (for example, an e-mail note or a Web page), the message gets divided into little chunks called packets. Each of these packets contains

both the sender's Internet address and the receiver's address. Any packet is sent first to a PC that understands a small part of the Internet. The PC reads the destination address and forwards the packet to an adjacent PC that in turn reads the destination address and so forth across the Internet until one PC recognizes the packet as belonging to a computer within its immediate neighborhood or domain. That PC then forwards the packet directly to the computer whose address is specified.

Switching Overview (Circuit and Packet)

There are a few terms that one must understand before realizing the tremendous efficiency of Voice-OverIP (VoIP). When a normal telephone call is placed between one person and another person down the street for instance, a method of switching called Circuit Switching is used. Circuit Switching is an age old and proven technology that has been around for over 120 years! What Circuit Switching actually does is make a connection from the phone in one house through the CO (Central Office) to the next home, which is held for the entire call time. For this dedicated connection someone has to pay for the connection to be made and for it to stay connected and used. A voice channel over a normal phone line is 64 Kilobits per second and is transmitting data in both directions the entire time. This wastes a great deal of bandwidth because a good percentage of a telephone conversation is silence since only one person is usually talking at a time. In conclusion, Circuit Switching dedicates a 64 Kilobit connection up and down for a total of 128 Kilobytes of data being transferred for this call per second. To do some simple math say the call lasts 40 minutes and is a normal conversation. During the time that it took to make this call a total of 38,400 Kilobytes of information (also roughly equivalent to 38.4 Mega-bytes) either way this is a huge amount of information that is being transferred. That being said we shall move on to Packet Switching.

One of the most amazing things that the Internet entails is a massive amount of routing redundancy. For instance the "World Wide Web" is tangled so tightly that if one strand in the web is broken it is very likely that you can find another way to your destination. And once past the connection to the Internet, the customer doesn't pay for anything else, therefore the rest is free, meaning you don't have to pay for the amount of information downloaded. When a connection is made from one Voice-Over IP to another they basically acknowledge that they will both transmit and receive data from each other on both sides of the connection data is only sent and received when there is activity coming from or to, otherwise there is no data being transmitted thereby allowing more calls to be made at the same time over a limited amount of bandwidth. To finish the comparison, VoIP could easily knock out half of the bandwidth needed for one phone call; this would leave that extra bandwidth for other calls that could be made simultaneously on the same line.

The switching in these two scenarios clearly has their differences, now we can move on to the theory behind IP Telephony and the benefits it has over the legacy system.

IP Telephony

Voice over IP takes advantage of the "free" aspect of the Internet. It defiantly costs money to connect to the Internet although once you are connected you can literally communicate with someone on another continent for free. Voice over IP uses the Internet to make phone calls eliminate the need for an international long distance carrier, thus forth saving large amounts of money.

Product Strengths

- No performance degradation due to multiple call handling.
- Very easy to install and setup. Our staff could have the system up and running in minutes.
- Fully scalable: 4 to 120 ports.
- Full support for T1 and E1 lines.
- Fully customizable to suit your needs.
- Complete control from anywhere via the Internet.
- Automated customer service.
- Unit can be upgraded in increments of 4-ports.
- Easy to read reports, statistics, and graphs.
- Provide Information.
- Portable, system can go anywhere you go with an Internet connection.
- Economical, saves immense amount of Investment capital.
- Help consumers control their spending
- Cost- effective.
- Customer satisfaction
- 24/7 Availability

Purchase/Recharge PIN via Internet:

Rechargeable prepaid phone cards offer the convenience of having one single card that does not expire. Keep your calling card PIN over any course of time and recharge it as many times as you want.

To recharge your calling card:

1. User visits the company web site and clicks on purchase or recharge PIN button.
2. User makes a selection for the value of the calling card.
3. User enters the credit card number and expiration date and clicks to confirm.
4. The system displays the new PIN and access number after validating the credit card data.

CardSaver Applications:

- Prepaid long distance
- Prepaid/Post long distance
- Prepaid ANI/CLI-based services
- credit card billing
- Prepaid customer support services
- Prepaid medical services
- Prepaid Audio text and Music services
- Long distance budget controls
- Prepaid Legal Services
- Prepaid business conferencing services
- Prepaid chat services
- Prepaid follow-me services
- Prepaid Internet services

digitized at 64 Kbps. But, with more advanced digital voice encoding techniques, it can handle more voice channels.

E1- E1 carries signals at 2 Mbps (32 channels at 64Kbps), versus the T1, which carries signals at 1.544 Mbps (24 channels at 64Kbps). E1 and T1 lines may be interconnected for international use.

Analog Loop Start- You "start" (seize) a phone line or trunk by giving it a supervisory signal. That signal is typically taking your phone off hook. There are two ways you can do that -- ground start or loop start. With loop start, you seize a line by bridging through a resistance the tip and ring (both wires) of your telephone line.

Protocols Supported

E&M

- E&M Type I signaling uses two leads, E and M, which share a common ground path. This signaling type is commonly used with electromechanical switching systems. Most electronic systems do not use it due to the noise induced by the common ground path.
- The Type II interface is designed for use with electronic switching systems. It uses four wires, a pair for the E lead and a pair for the M lead. The signaling system is fully looped with the CU and SE having independent batteries and grounds. The SE controls the E lead and the CU controls the M lead.
- The E&M Type V interface is widely used outside North America. It can be used in SSDC5A type circuits on the IDNX. This interface is an unbalanced version of E&M Type IV signaling from the trunk circuit to the signaling facility is over the M lead; signaling in the reverse direction is over the E lead. Local ground is used for off-hook instead of the ground obtained from the SB or SG lead. This makes this interface a two-wire type

ISDN

- Integrated services digital network, an international communications standard for sending voice, video, and data over digital telephone lines or normal telephone wires. ISDN supports data transfer rates of 64 Kbps (64,000 bits per second).

R2 MFC

- Each protocol is parameterized, giving developers the ability to adapt the protocol to multiple target environments worldwide. The MFC-R2 protocol states and events are identical for all countries, but certain parameters, such as tone duration, vary.

Deliverables

The CardSaver package includes:

- 1 Free 24/7 Tech Support
- 2 Script Library
- 3 Sample Voice Recordings
- 4 Detailed Manual
- 5 Training Videos
- 6 Wave Editor (shareware)
- 7 Phone Cables

Call Volume Per System and Statistics

CardSaver System	Minutes Per Day
30 Line System	Up to 18,000
60 Line System	Up to 36,000
120 Line System	Up to 72,000

Warranty and Customer Support

Warranty Period:	1 Year from the Date of Purchase. - Unconditional
Customer Support:	1 Year provided by telephone - 10 Hours of Phone Time Monday to Friday - 9 to 5 - EST (U.S.A. Time) Hours
Off-Hour Support:	Provided by PEC's Overseas support centers
Modem Support:	5 Hours Maximum
Software Upgrade:	Free for one year
Bulletin Board:	24 Hours a Day - Seven Days a Week
Web Site:	Updated once a week
Hardware Repair:	Within 2 working Days
URL:	http://www.pulsewan.com
Email:	voip@pulsewan.com
Programming Work:	Provided upon request and separate charge.

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