



Avoiding the Remote Callout

Presented By
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DISCLAIMER

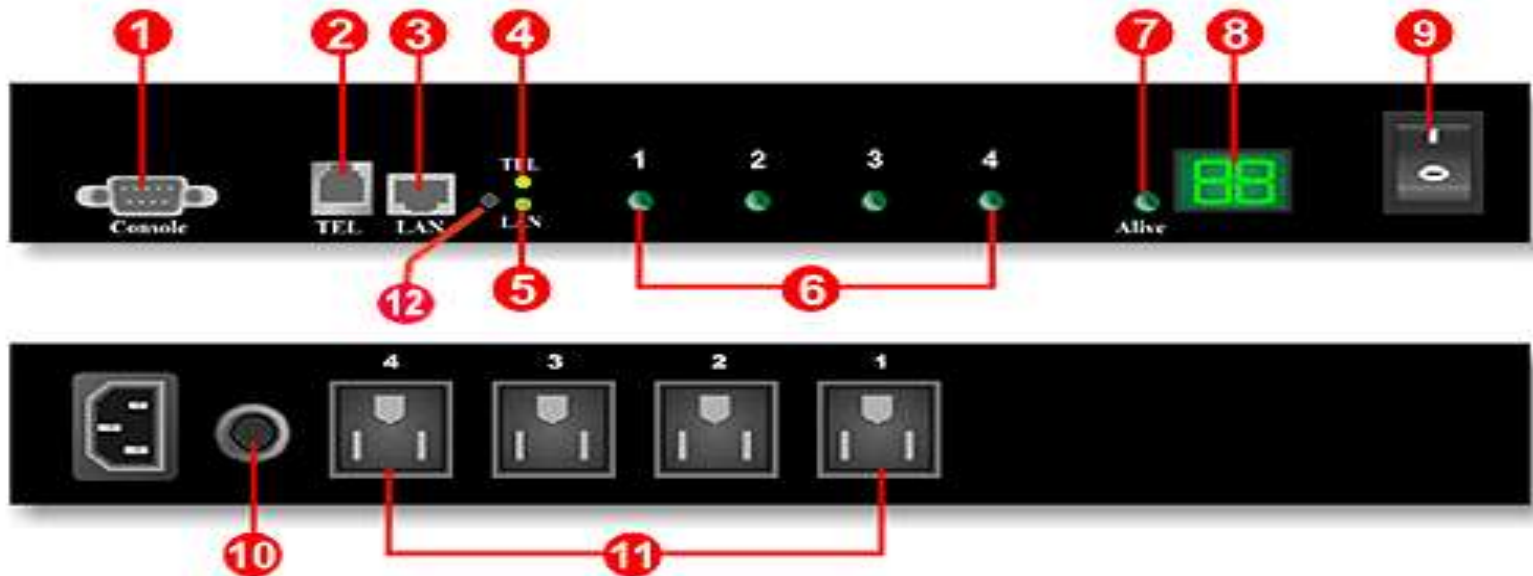
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- The contents presented here do not necessarily reflect the official views or policies of the State of California and / or the California Department of Transportation.

- **The Problem-** A field element is no longer communicating with the TMC.
- **In The Past-** The element is verified by Operations and/or Maintenance to be unreachable. A technician is notified and sent to the field to investigate.
- **Current Solution-** Interrogate the Intelligent Power Controller and reset the suspect device.

- There are many devices available that will allow remote power control. For example, the infamous X10 and the popular WebRelay, but there are always drawbacks to these types of devices. The power controller will usually lack Public Switched Telephone Network (PSTN) control or Web control and are rarely hardened.

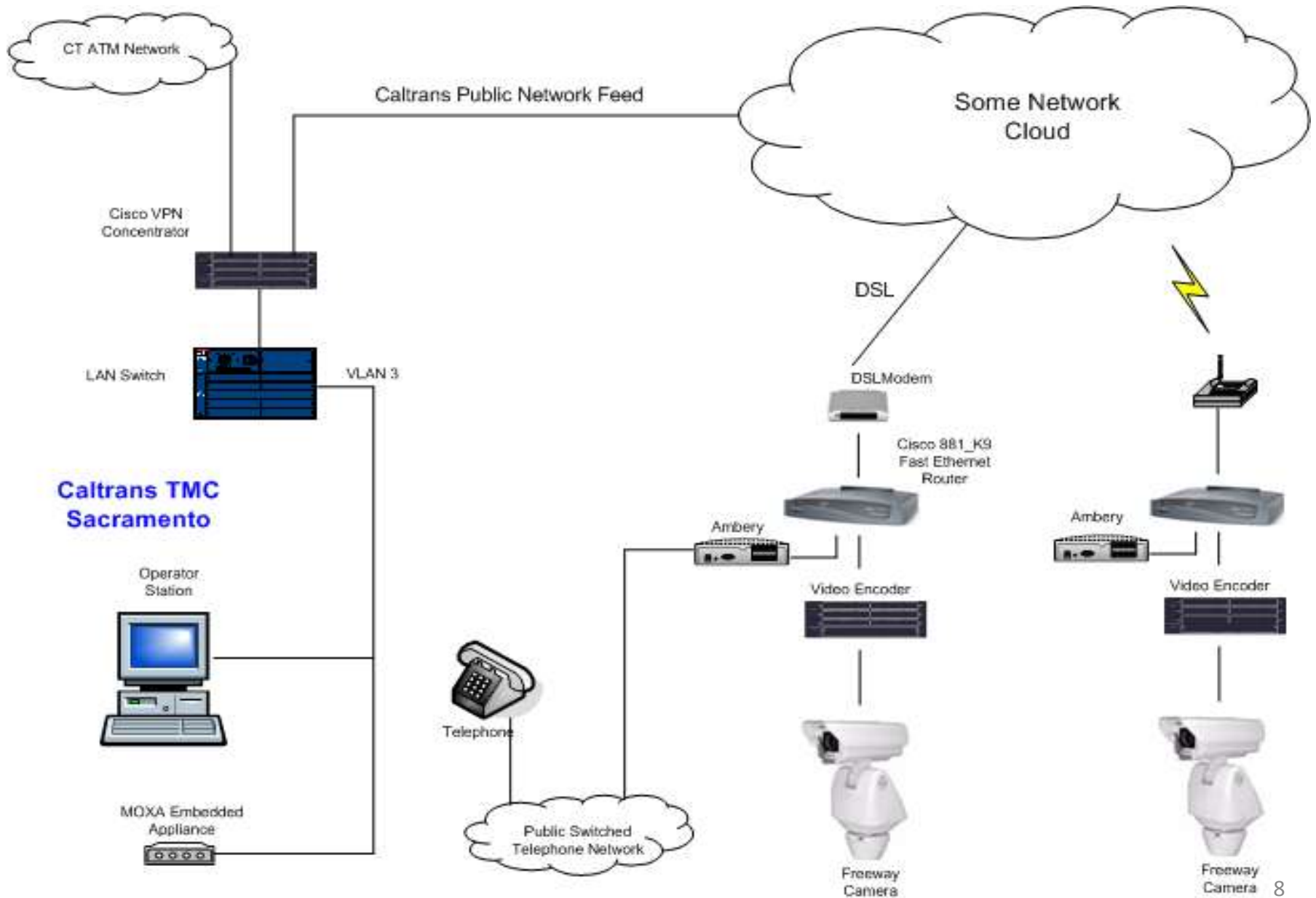
- In the past, an Uninterruptable Power Supply (APC and Tripp Lite) with a switchable outlet via web interface has been used to allow device resets with moderate success. However, there are two problems;
- First, one outlet was switchable by use of the web interface only. So, if the device to be reset was a DSL modem or router the UPS could not be used for reset.
- Second, when the battery voltage decayed to a low enough voltage after approximately three years the UPS would shut down. What does the U mean in UPS again? This requires a strict battery maintenance schedule to keep field elements from shutting down.

- The advantage of this remote power controller over other control units is its telephone control function. If the network locks up or devices become unreachable there is always a telephone option for controlling remote devices.



1	RS232 Port For Connection With Remote Console	7	Operating LED Indicator
2	Telephone Jack	8	Total Electrical Current Reading Monitor
3	RJ-45 Network LAN Port	9	Local Manual Power On/Off
4	Phone Control Mode LED Indicator	10	Circuit Breaker Protector
5	Web Control Mode LED Indicator	11	4 AC Power Sockets
6	Power Outlet Channel LED	12	Reset Button

System Diagram

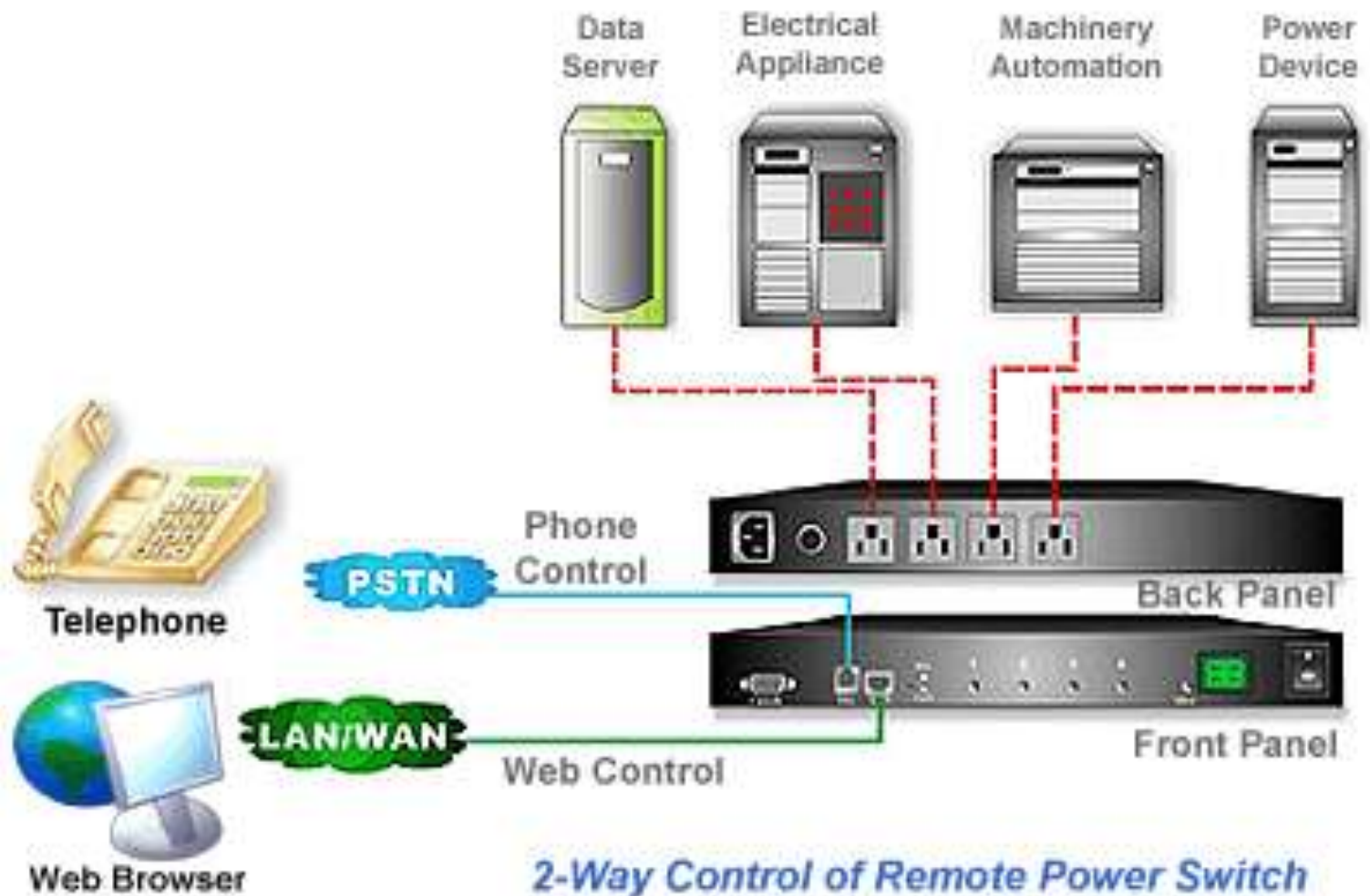


Cabinet Picture



Location Picture





Ambery Monitor Page

Smart Remote Power Manager **IP-P3**

AMBERY

REMOTE POWER SWITCH SERIES

Monitor
System
Firewall
Account
TimeSync
Event
Upgrade
Logout

All ON

ON

All OFF

OFF

Total Current: 0 Amp

Device Temp.: 88°F

Warning Temp.: °F

1 Set	2 Set	3 Set	4 Set
<input type="checkbox"/> OFF	<input type="checkbox"/> OFF	<input type="checkbox"/> OFF	<input checked="" type="checkbox"/> ON
DSL Modem	Codec	Camera	WebRelay

Configuration
Schedule
Network
Temperature
Voice

Description	Start Delay Time	Shutdown Delay Time	Boot/Shutdown MAC Address
<input style="width: 95%;" type="text"/>	real-time <input style="width: 30px;" type="text" value="v"/>	real-time <input style="width: 30px;" type="text" value="v"/>	<input style="width: 20px;" type="text"/> : <input style="width: 20px;" type="text"/> : <input style="width: 20px;" type="text"/> : <input style="width: 20px;" type="text"/> : <input style="width: 20px;" type="text"/> : <input style="width: 20px;" type="text"/>

Ambery Demonstrations

- Front page demo (control page)
- Scheduling page demo
- DTMF demo

Network Page

Smart Remote Power Manager IP-P3

REMOTE POWER SWITCH SERIES

AMBERY

Monitor System Firewall Account TimeSync Event Upgrade Logout

Network Mail Server SMS Server SNMP/SysLog Other

Network Setup

IP SET DHCP SET

IP Address	<input type="text"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>
Gateway	<input type="text"/>

Domain Name Server Setup

DNS Server 1	<input type="text"/>
DNS Server 2	<input type="text"/>

Web Server Setup

Http Port Open	<input type="text" value="HTTP"/>
Http Port	<input type="text" value="80"/>
Http SSL port	<input type="text" value="443"/>
API port	<input type="text" value="12345"/>

Save

Firewall Page

Smart Remote Power Manager IP-P3 **AMBERY**
REMOTE POWER SWITCH SERIES

Monitor System **Firewall** Account TimeSync Event Upgrade Logout

IP Filter MAC Filter

IP Filter Setup	
IP Filter Open	<input type="checkbox"/>
Allow IP Address	Delete

10 . 28 . 2 . 32 ~ 32 ADD

Save

IP Filter **MAC Filter**

MAC Filter Setup	
MAC Filter Open	<input type="checkbox"/>
Allow MAC Address	Delete

: : : : : ADD

Save

Account Page

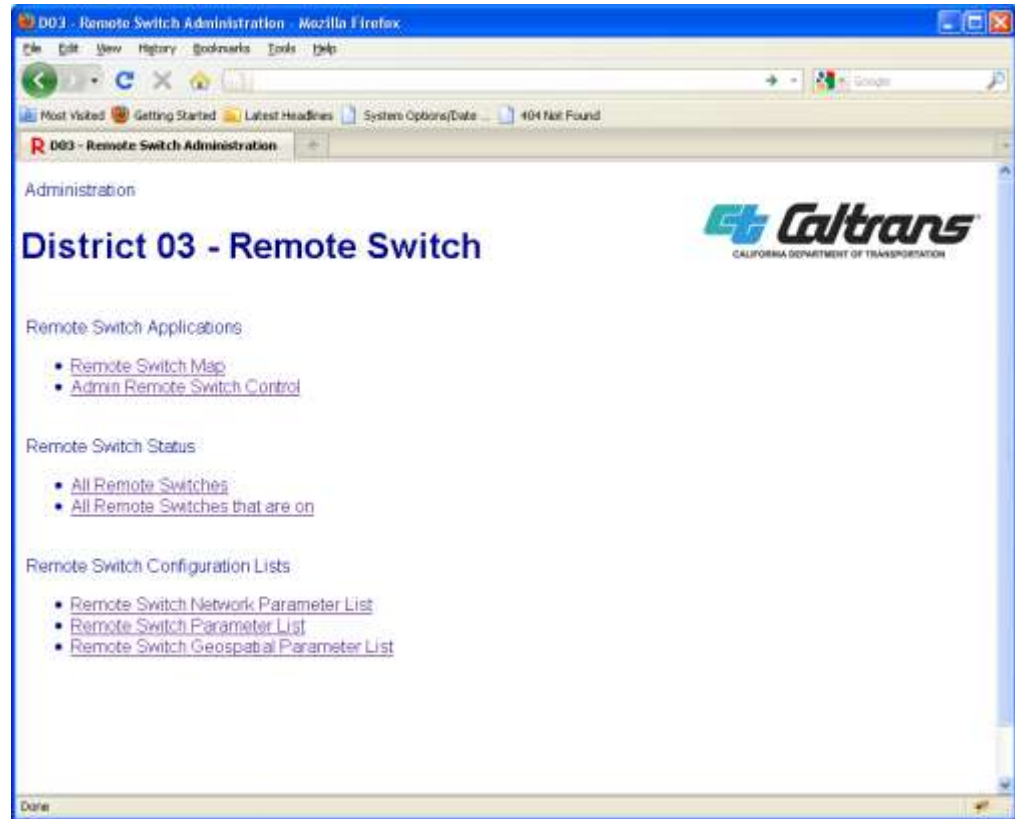
Smart Remote Power Manager IP-P3 **AMBERY**
REMOTE POWER SWITCH SERIES

Monitor System Firewall **Account** TimeSync Event Upgrade Logout

ID	Account	Password	TEL Password	Cellphone	Mail Address	1	2	3	4	Del
1	admin	•••••	••••••			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Remote Switch Interface

- This is the administration page
- All of the main pages are referenced off of this page
- Administrator / operator can click into the two remote switch applications
- Administrator / operator can click into the status of the remote switch fleet
- Administrator can configure the remote switch fleet based on network parameters, geospatial parameters or general parameters



Remote Switch Interface

- Here is an example of one of the parameter pages for the remote switch, the Geospatial Parameter List
- All of the remote switches in the fleet are listed, along with the respective parameters in a spreadsheet fashion.
- The administrator can pick a remote switch location and edit the parameters.

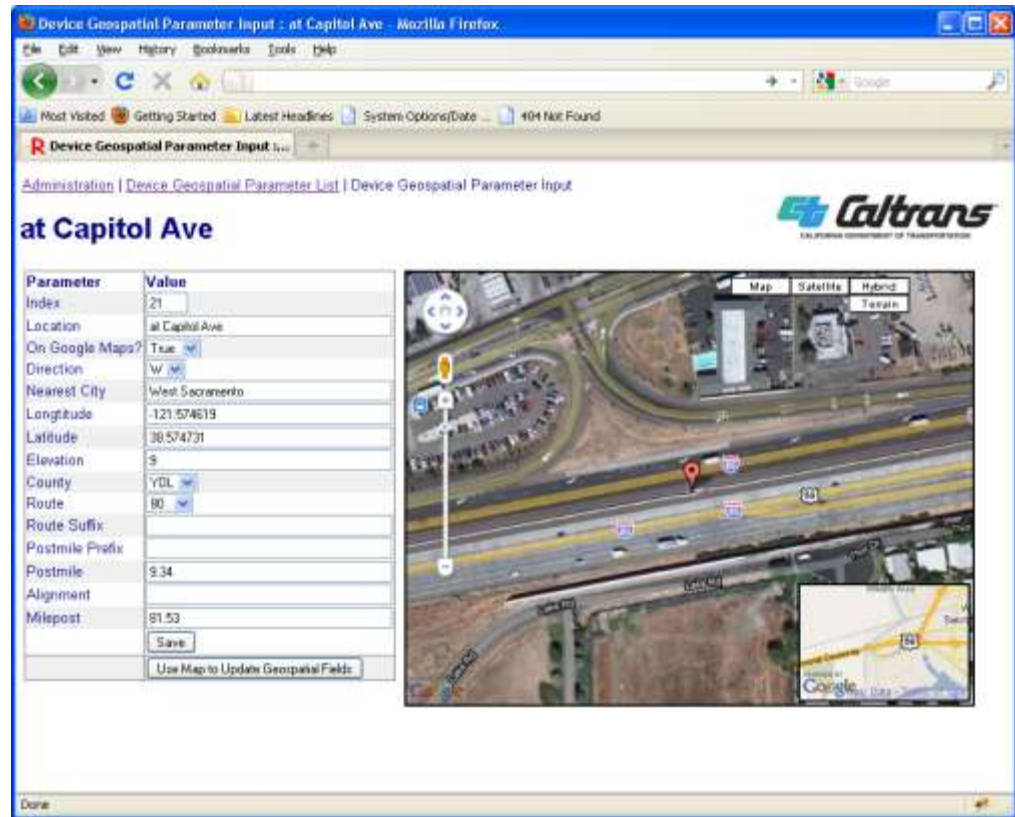
Geospatial List - As Of 6/02/2011 At 9:14:35 - Mozilla Firefox

Device Geospatial Parameter List - As Of 6/02/2011 At 9:14:35

id	district	location name	confirmed google	nearest city	longitude	latitude	elevation	direction	county	route	route suffix	postmile prefix	postmile alignment	left milepost
1	S	Tahoe City	FALSE	Elk Grove	-120.20094	39.20199	42	N	SAC	51			16.53	289.99
2	S	Hornswood	FALSE		-125	37		E	PLA	06				
3	S	Kings Beach	FALSE	Kings Beach	-120.01595	39.233389	6290	W	PLA	28			10.23	10.18
4	S	Kings Beach	FALSE	Kings Beach	-120.0383	39.236094	6250	E	PLA	28			8.96	9.89
5	S	SD Packet Rd - 47th Ave	FALSE	Hemlock	-122.583219	41.933433	2318	N	SIS	5	R		85.98	L 761.02
6	S	at Carvins	FALSE	North Fork	-119.506444	37.229444	2637	E					0	0
7	S	JMO Witt - Bradshaw	FALSE		-121.37095	39.65962		E	SAC	50			5.9	
8	S	ED Zimlandi - Bradshaw	True	Marcho, California	-121.28619	39.592072	104	W	SAC	50	R		11.03	10.85
9	S	Cabrins - 47th Ave	True	Elk Grove	-121.407933	39.482071	28	N	SAC	08			15.9	290.37
10	S	JMO 12th Ave - 47th Ave	FALSE	Sacramento	-121.4738	39.54109	22	E	SAC	08			23.18	297.53
11	S	at Gold Run	FALSE	Gold Run	-120.98285	39.172206	3221	E	PLA	06			41.12	142.51
12	S	at Gold Run	FALSE	Gold Run	-120.92953	39.185972	3323	W	PLA	06			42.05	144.94
13	S	at Baxter	FALSE		-120.77245	39.21966		E	PLA	00			47.36	
14	S	at Baxter	FALSE		-120.77599	39.21462		W	PLA	00			46.925	
15	S	JMO Blue Calyx #32	FALSE		-120.70542	39.283694		W	PLA	00			52.36	
16	S	at Striplin Road	FALSE	Nicolazzi	-121.56395	39.88475	25	N	SUT	00			9.15	312.52
17	S	at Dilford Rd	FALSE	Witten	-121.324146	39.344009	29	N	SAC	06			7.25	281.7
18	S	at SawSt Co Line	FALSE		135	37		N	SUT	00			0	
19	S	JMO 0670 IC	FALSE	Pleasant Grove	-121.54052	39.84662	19	N	SUT	70			0.2	0.15
20	S	at Bythe Bend Bl	True	West Sacramento	-121.5488	39.597022	13	E	YDL	00	R		11.14	83.33
21	S	at Capitol Ave	True	West Sacramento	-121.574619	39.574731	8	W	YDL	00			9.24	81.53
22	S	DMG #59 Acacia Run	FALSE		-120.662314	39.42316300		E	PLA	06			0	

Remote Switch Interface

- These are the geospatial parameters at I-80 Capitol Avenue in West Sacramento, CA.
- The administrator can manually edit the parameters as necessary.
- Using the Google Map API, the administrator can also drag the marker to fine tune the geospatial parameters.
- Clicking on the “Use Map to Update Geospatial Fields” sends the marker’s current longitude / latitude to the server.
- The server will use several different APIs to resolve the following fields: Nearest City, Elevation, County, Route, Route Suffix, Postmile Prefix, Postmile, Alignment and Milepost.



Remote Switch Interface

- Here is the same information using the Google Map Street View API.
- Sure enough, the EMS field device is near where the marker indicates.
- Disclaimer – While the Google Maps API is a good tool to find the general longitude / latitude of a field device, it is not intended to be the definitive geospatial locator tool.

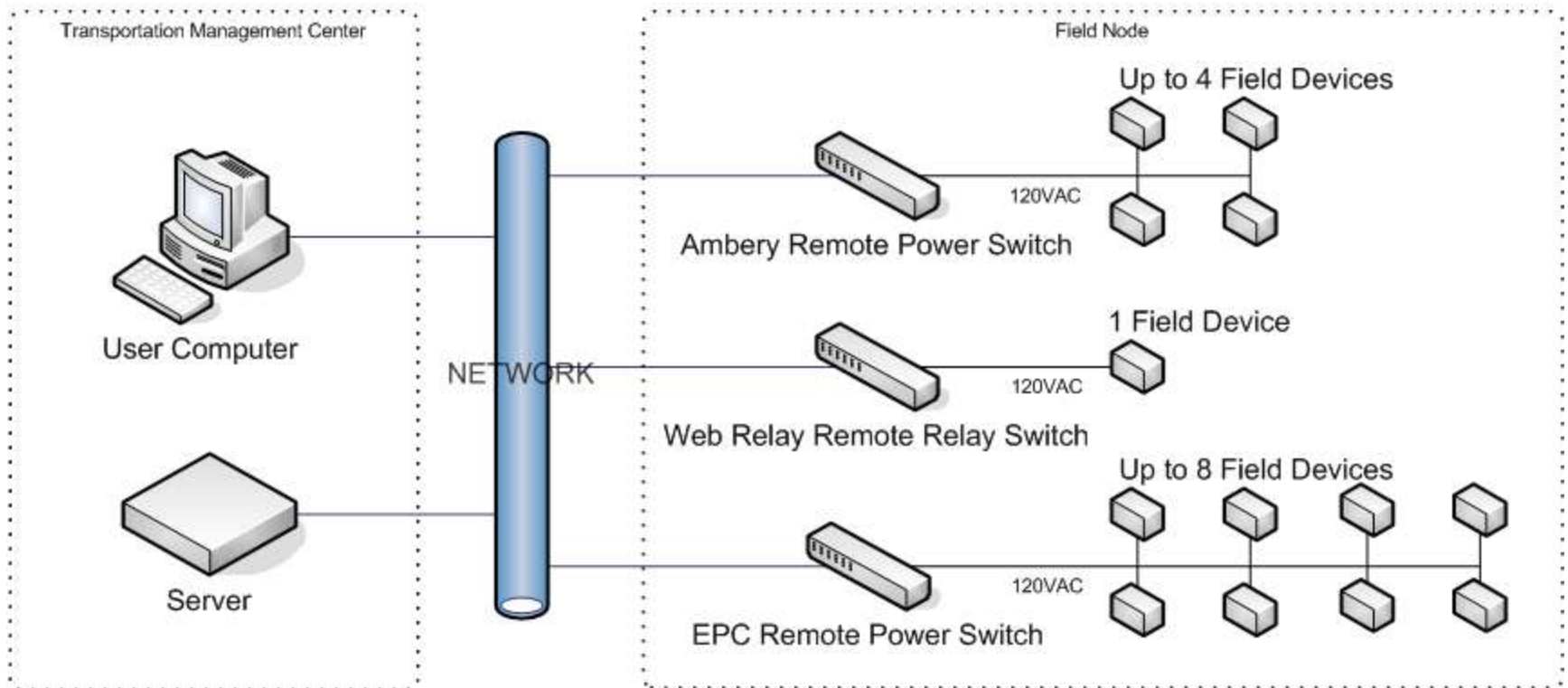
The screenshot shows a web browser window titled "Device Geospatial Parameter Input - at Capitol Ave - Mozilla Firefox". The browser's address bar shows "http://www.caltrans.ca.gov/ems/". The page content includes the Caltrans logo and the heading "at Capitol Ave".

Parameter	Value
Index	21
Location	at Capitol Ave
On Google Maps?	True
Direction	W
Nearest City	West Sacramento
Longitude	-121.574619
Latitude	38.574731
Elevation	9
County	YDL
Route	80
Route Suffix	
Postmile Prefix	
Postmile	5.34
Alignment	
Milepost	81.53

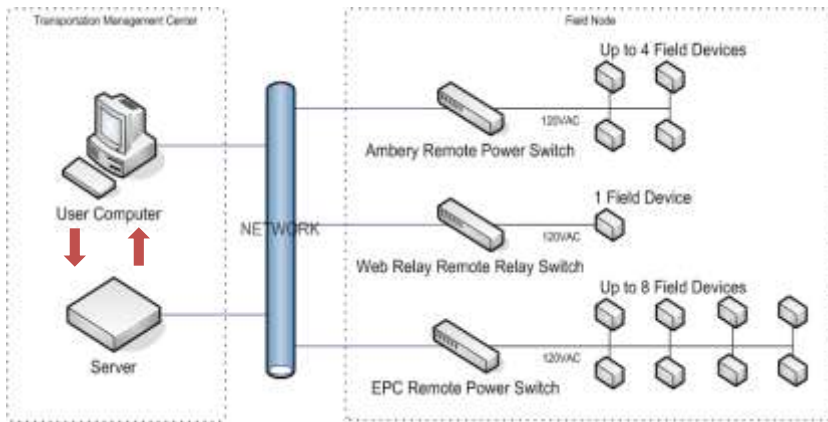
Below the table are "Save" and "Use Map to Update Geospatial Fields" buttons.

The right side of the page features a Google Street View map of Interstate 80 in West Sacramento, California. A red location pin is placed on the road, and a small inset map shows the location within the Sacramento area.

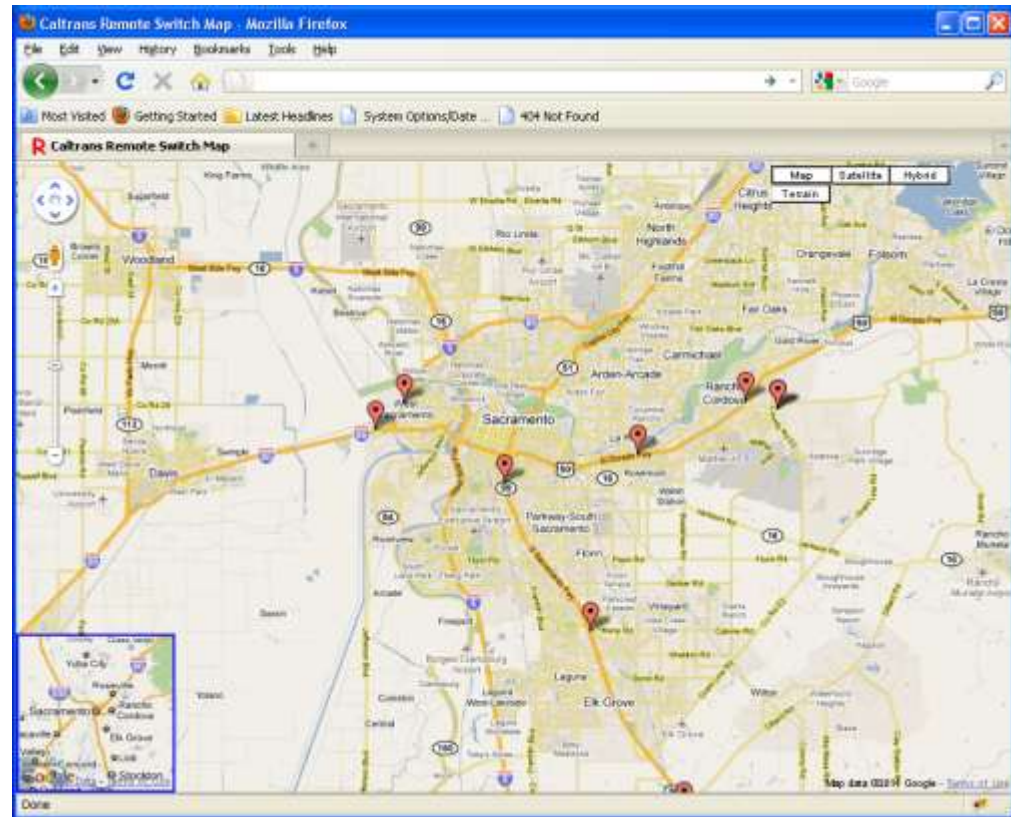
Remote Switch Interface



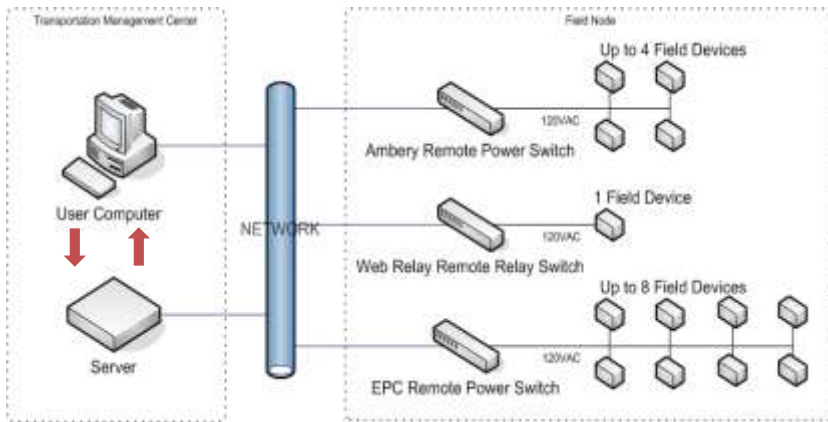
Remote Switch Interface



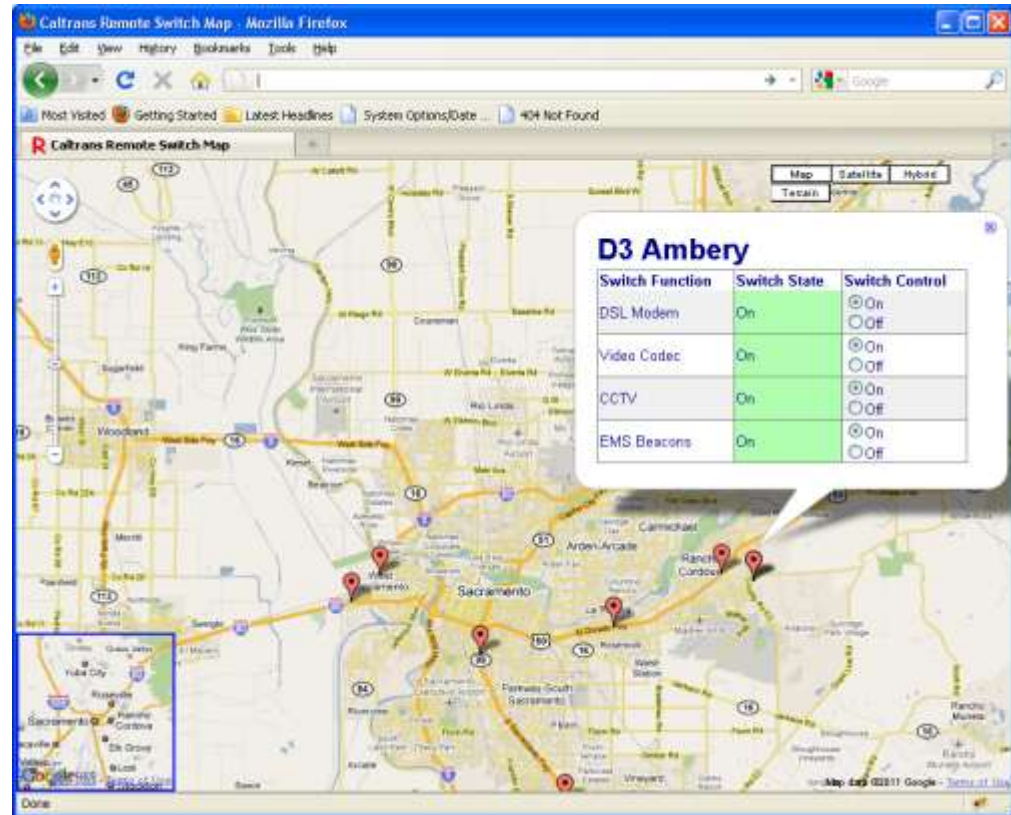
- Operator uses web-browser to call up map application.
- Server sends web page and data set to web-browser.
- Google Maps API supplies mapping facility.
- Operator can pan and zoom to area on map needed.



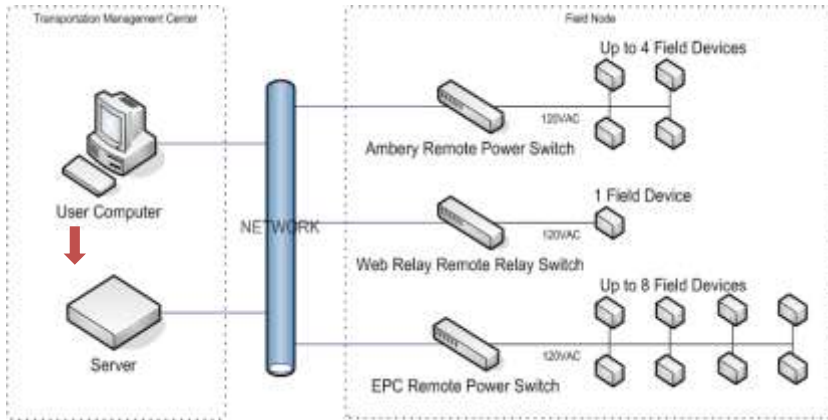
Remote Switch Interface



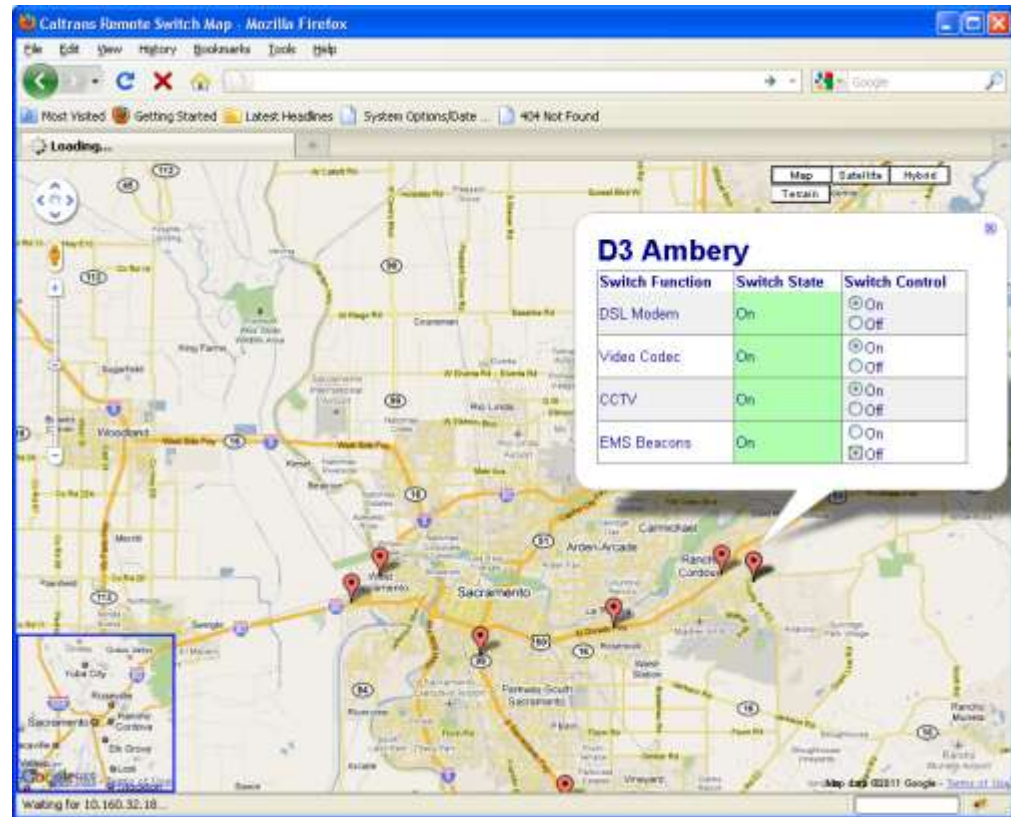
- Operator selects marker which represents field location, which sends request to server.
- Server sends web page with current information related to field location to web-browser.



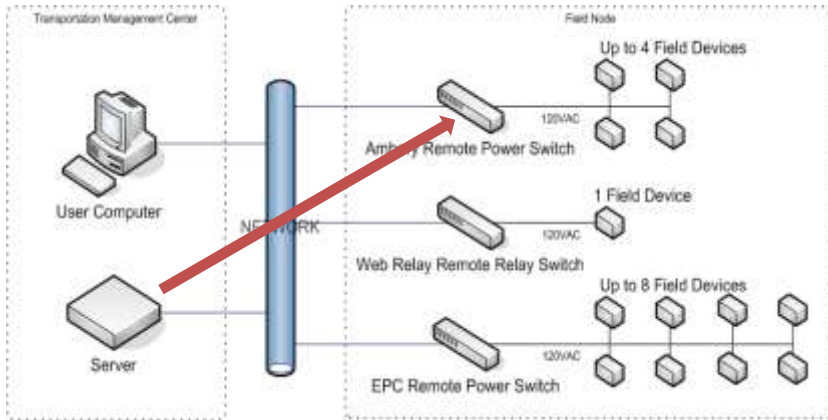
Remote Switch Interface



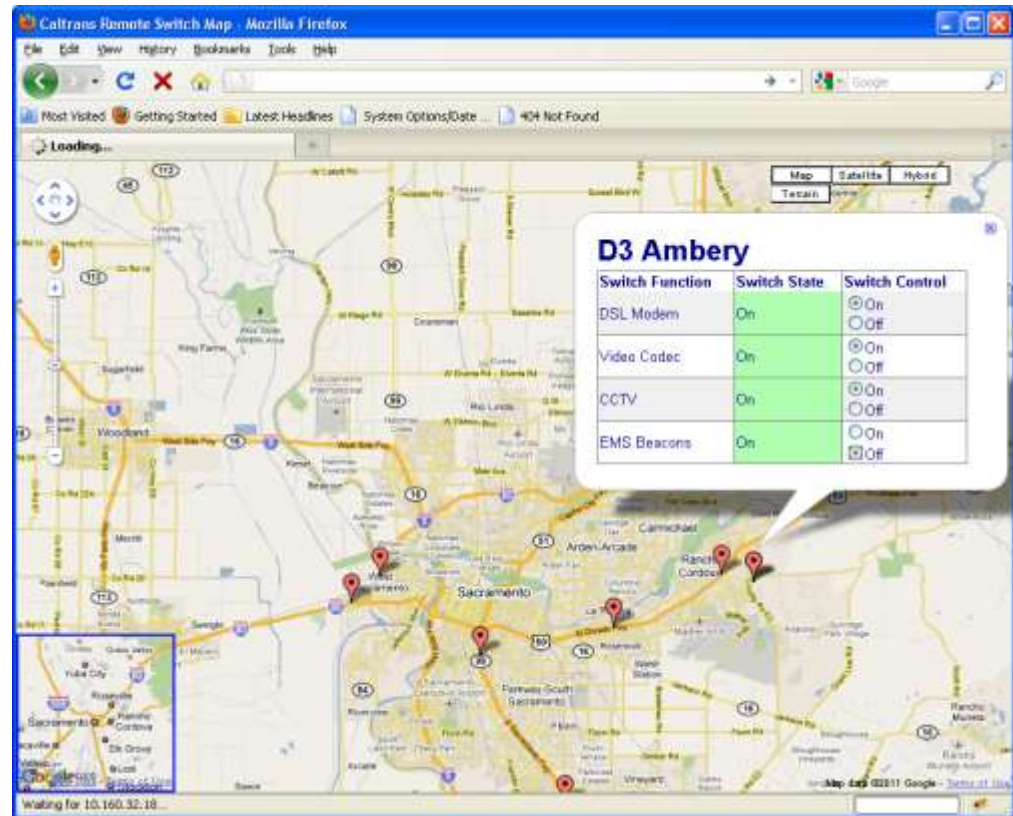
- Operator can remotely switch on or off any of the switches listed in the map bubble.
- When operator makes a selection, application automatically sends a request to the server.



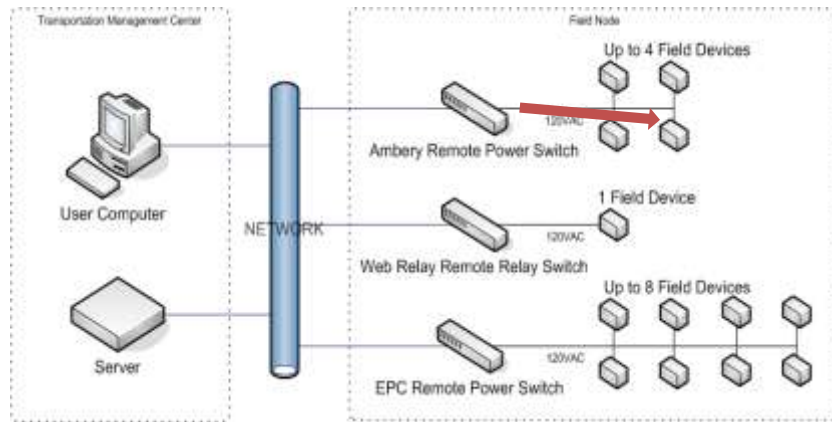
Remote Switch Interface



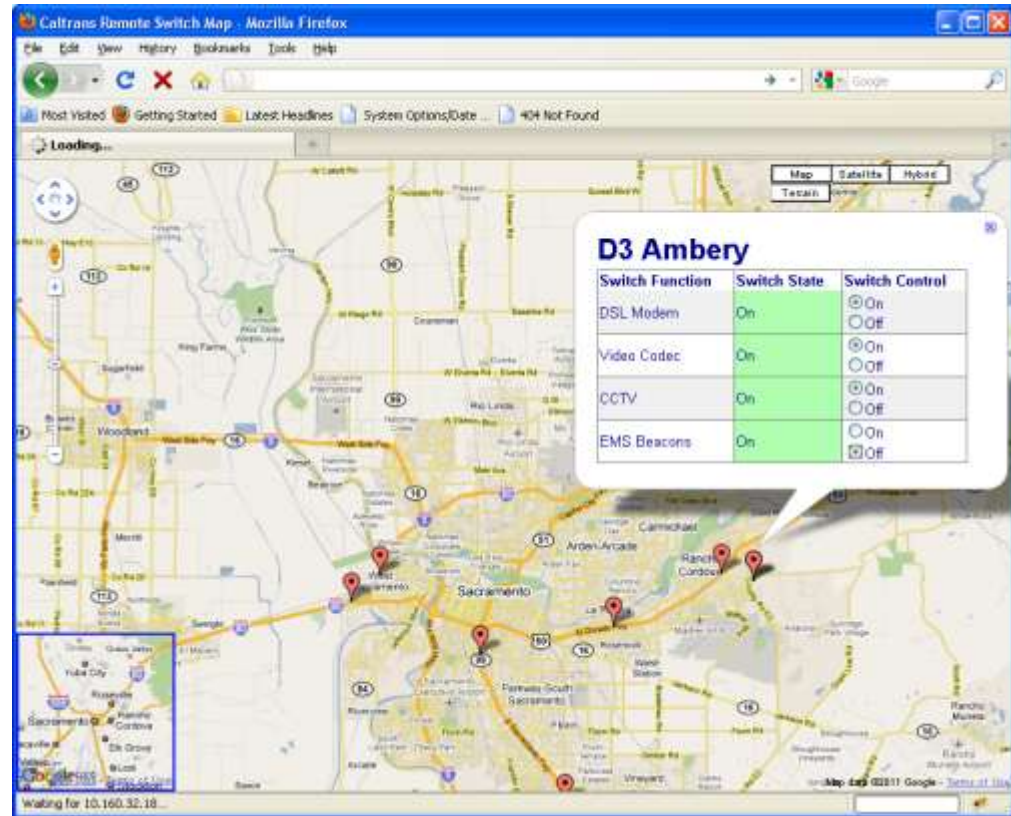
- Server determines correct device API .
- Server sends the device a request to perform the operator's action.



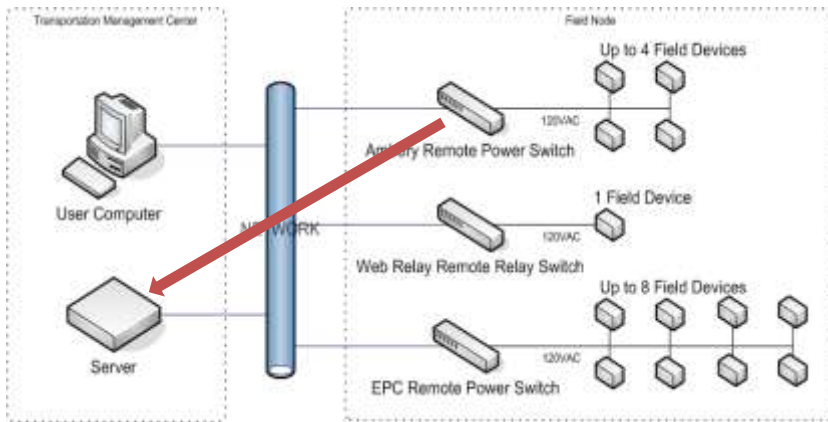
Remote Switch Interface



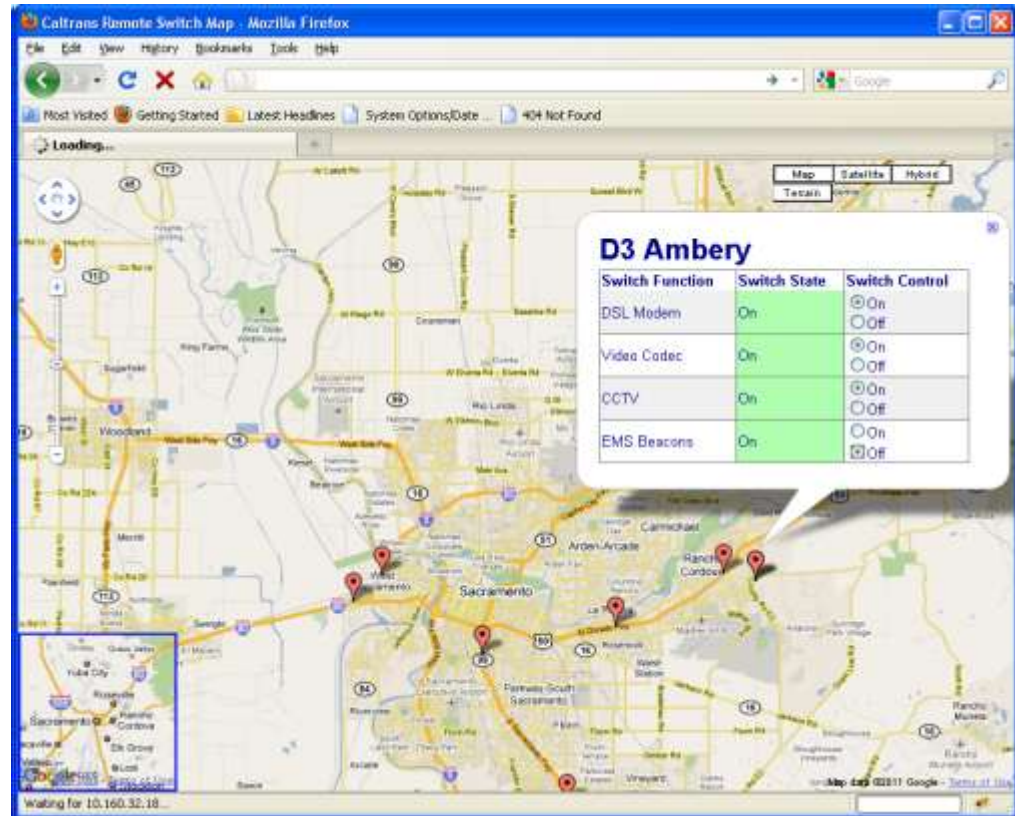
- Remote switch device interprets command received and performs operation.
- Field device either turns on or off.



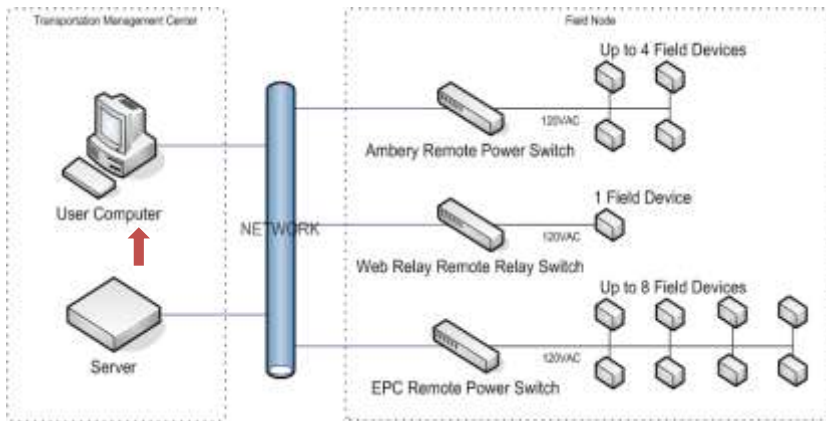
Remote Switch Interface



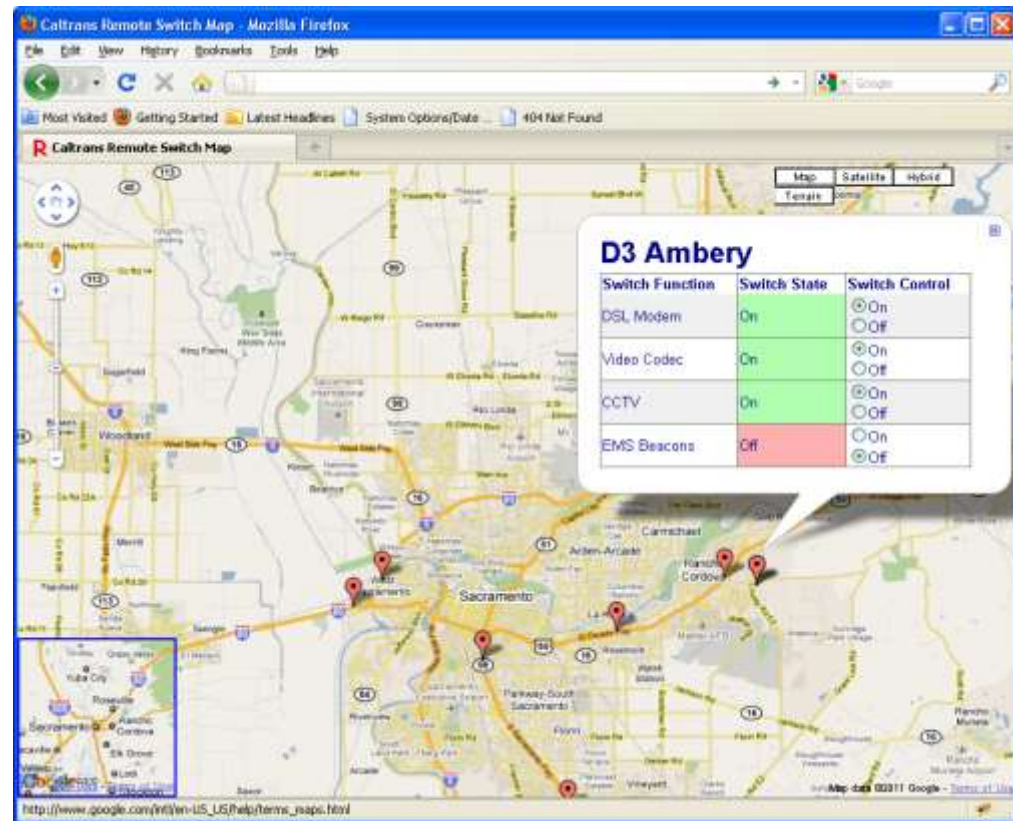
- Remote switch device sends a confirmation back to the server, acknowledging that the request has been performed.
- Server updates status logs with current state of remote switch and also logs time and date.



Remote Switch Interface



- Server sends updated information back to map bubble.
- Map bubble updates itself.
- Operator views current state of remote switch.
- Operator can close map bubble and move on to next objective.



Remote Switch Interface

