SMITH™

SMITH LINK

Smith Electric Vehicles Telemetry Platform

SMITH LINK

Smith Link is used to:

- Help Support department with vehicle diagnostics
- Support Product continual development
- Monitor vehicle performance

Key Facts:

- 2500 data points each second
- ~ 500 vehicles
- 1.8 billion data points per day

Design of the Smith-Link system is "on the frontier of today's application techniques" – [cio.com](cio.com)

SMITH LINK

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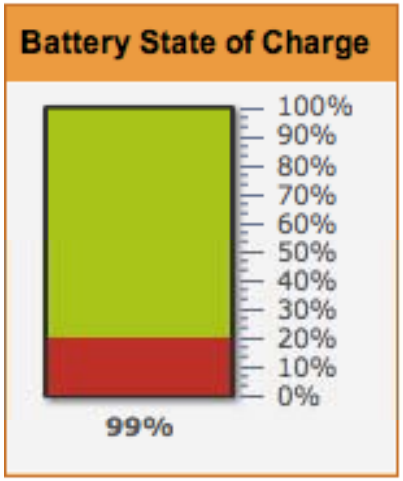
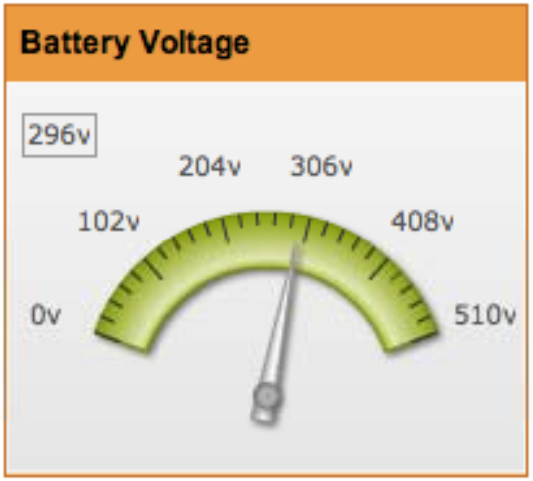
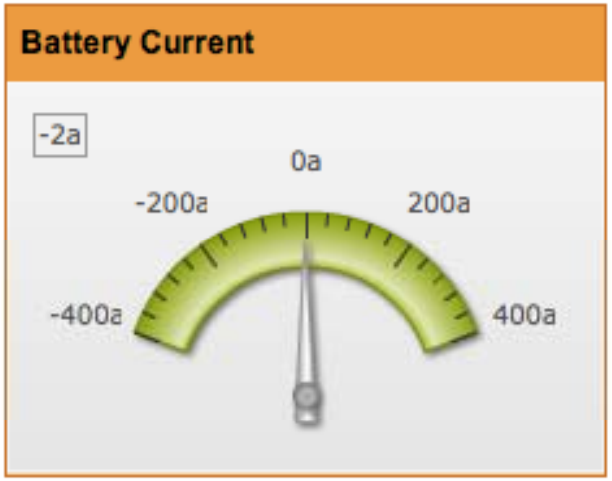
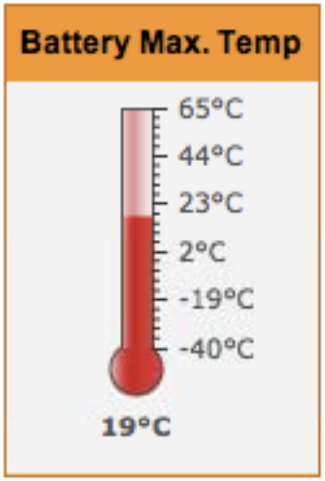

Battery State of Charge
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
99%


Battery Voltage
296v
204v
306v
102v
408v
0v
510v


Battery Current
-2a
0a
-200a
200a
-400a
400a


Battery Max. Temp
65°C
44°C
23°C
2°C
-19°C
-40°C
19°C

SMITH LINK

SMITH LINK
DASHBOARD
PERFORMANCE
CARBON
SETTINGS
LIVE
ROUTE
HISTORY
USAGE
SETTINGS
ANALYSIS
FAULTS
SERVICE
NOTES
DEVICE ISSUE
DASHBOARD
100%
75%
50%
25%
0%
31%
State of Charge
314V
204V
306V
102V
408V
0V
510V
Voltage
-125A
0A
-200A
200A
-400A
400A
Current
Speed
FAULT
BATT WARN
DT OVERTEMP
REGEN ENABLED
ABS ACTIVE
VS STATE
MS STATUS
MS STATE
DRIVETRAIN
RPM (x1000)
-125A
0A
-200A
200A
-400A
400A
Torque Command
Accelerator pedal 25%
Brake pedal 0%
Availability 100%
24V Battery 24V
MSVDCL 123
MSVDCB 132
Fan
Pump
REVERSING
Motor
TEMPERATURES
Battery 1°C
Drivetrain 1°C
Cab 1°C
Inverter T1 1°C
Inverter T2 1°C
Inverter T3 1°C
Inverter T4 1°C
Motor T1 1°C
Motor T2 1°C

SMITH LINK

Vancouver
Minneapolis
Montreal
Toronto
Chicago
United States of America
Denver
San Francisco
St. Louis
Washington D.C.
Phoenix
Dallas
Atlanta
Houston
Tampa
Monterrey
México
Guadalajara
Puebla
Belize
Guatemala
El Salvador
Nicaragua
Cuba
Grand Cayman
Haiti
Dominica
Aruba
Bermuda
Saint Pierre et Miquelon

SMITH LINK

MICHAEL PEACOCK

PERFORMANCE

Smith Link → Customer area → Performance report

PERFORMANCE REPORT

Performance Summary: 1st Jan 2012 - 14th Jan 2012	
Statistics	
Distance	41450 miles
% over 40mph	52%
Accelerator Peaks	42 per mile
Brake peaks	1767 per mile
NET Cumulative Energy Draw	57761kWh
Gross Cumulative Energy Draw	62086kWh
Total Regenerative Braking Energy	4325kWh
Regenerative Energy Per Mile	0.1kWh/mile
Regenerative Energy Ratio	7%
Efficiency	0.7176 miles/kWh 1.3935 kWh/mile
On time	1952:29:18
Drive time	1343:58:17
A/C Usage	289:03:27
Heater Usage	246:30:13
Carbon offset details (*Estimated*)	
Carbon cost for journey	3732.38Kg
Typical cost for journey using diesel truck	8708.71Kg
Carbon saving	4976.33Kg

Details
3rd Jan 2012
4th Jan 2012
6th Jan 2012
7th Jan 2012
9th Jan 2012
10th Jan 2012
12th Jan 2012
13th Jan 2012
14th Jan 2012
5th Jan 2012
11th Jan 2012
2nd Jan 2012
1st Jan 2012
8th Jan 2012

Only days where a vehicle travelled 1 mile or more are shown in detail.

Practical Uses of Telemetry for Battery Diagnostics

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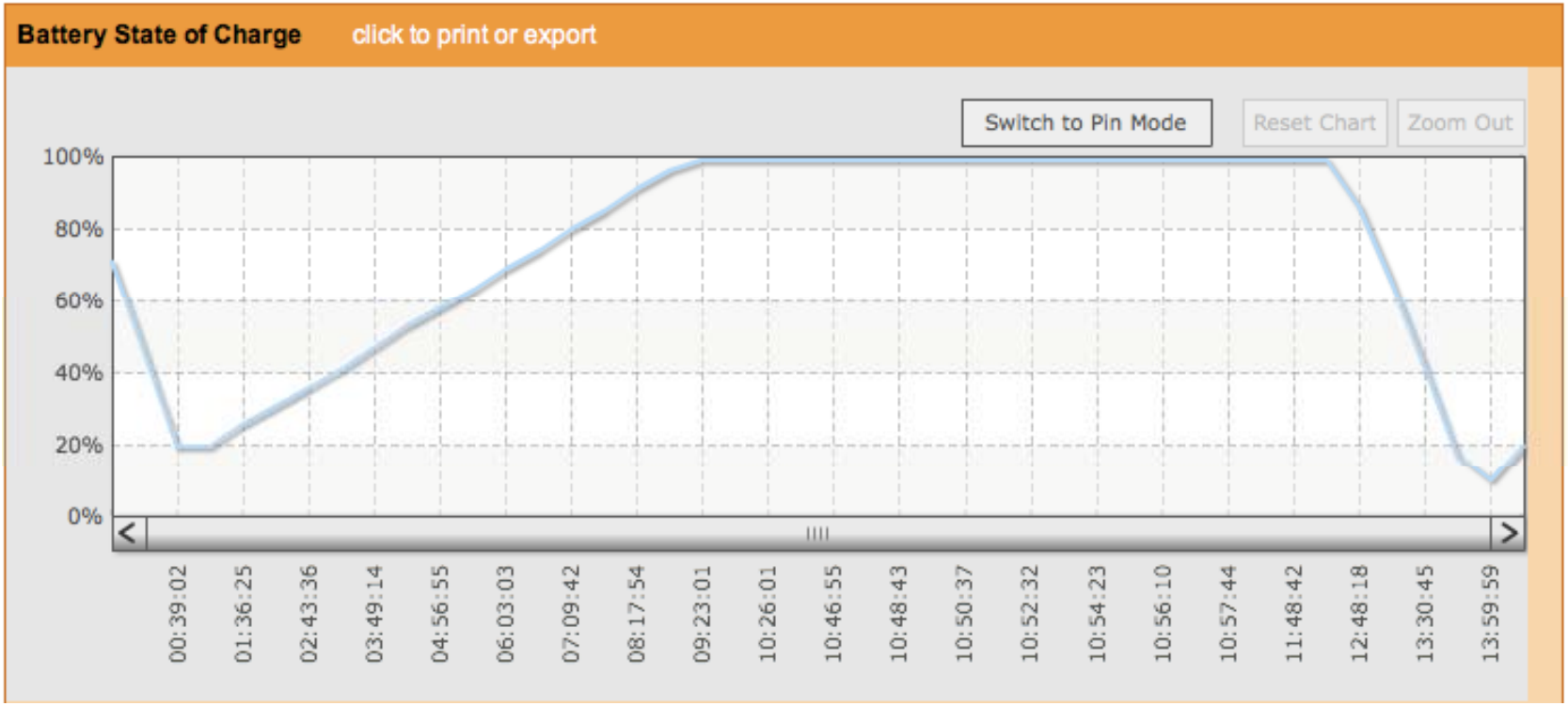
Battery State of Charge
click to print or export
Switch to Pin Mode
Reset Chart
Zoom Out
100%
80%
60%
40%
20%
0%
00:39:02
01:36:25
02:43:36
03:49:14
04:56:55
06:03:03
07:09:42
08:17:54
09:23:01
10:26:01
10:46:55
10:48:43
10:50:37
10:52:32
10:54:23
10:56:10
10:57:44
11:48:42
12:48:18
13:30:45
13:59:59

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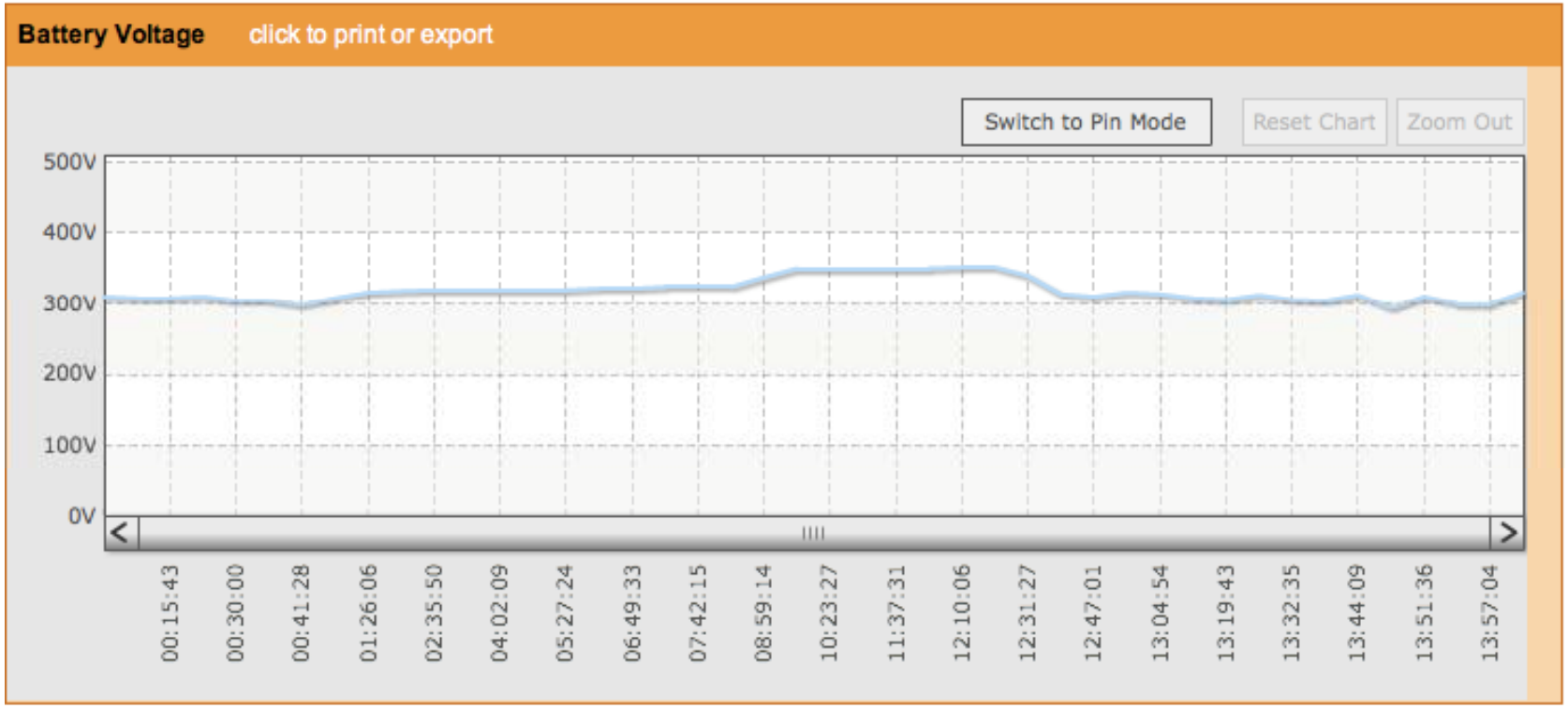
Battery Voltage
click to print or export
Switch to Pin Mode
Reset Chart
Zoom Out
500V
400V
300V
200V
100V
0V
00:15:43
00:30:00
00:41:28
01:26:06
02:35:50
04:02:09
05:27:24
06:49:33
07:42:15
08:59:14
10:23:27
11:37:31
12:10:06
12:31:27
12:47:01
13:04:54
13:19:43
13:32:35
13:44:09
13:51:36
13:57:04

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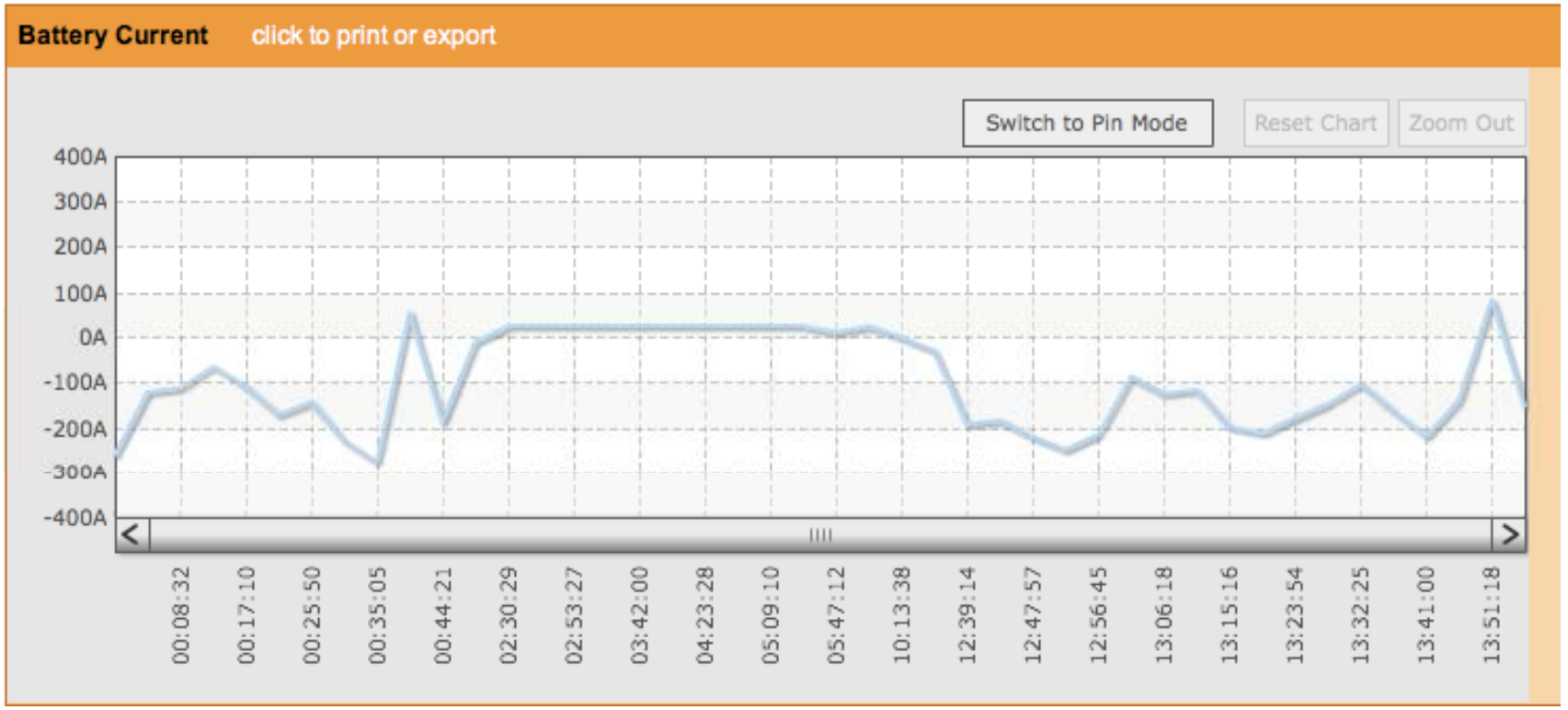
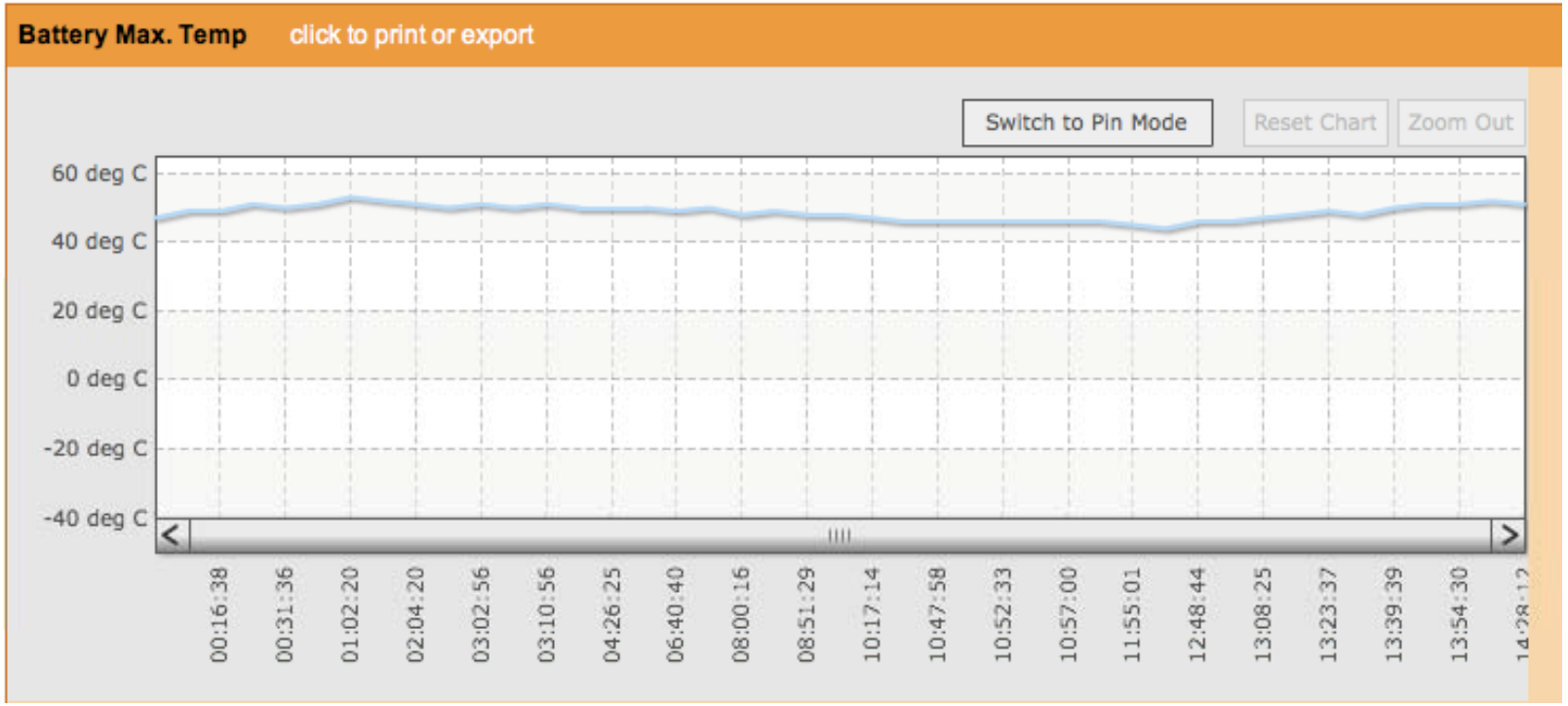

Battery Current
click to print or export
Switch to Pin Mode
Reset Chart
Zoom Out
400A
300A
200A
100A
0A
-100A
-200A
-300A
-400A
00:08:32
00:17:10
00:25:50
00:35:05
00:44:21
02:30:29
02:53:27
03:42:00
04:23:28
05:09:10
05:47:12
10:13:38
12:39:14
12:47:57
12:56:45
13:06:18
13:15:16
13:23:54
13:32:25
13:41:00
13:51:18

SMITH LINK


Battery Max. Temp
click to print or export
Switch to Pin Mode
Reset Chart
Zoom Out
60 deg C
40 deg C
20 deg C
0 deg C
-20 deg C
-40 deg C
00:16:38
00:31:36
01:02:20
02:04:20
03:02:56
03:10:56
04:26:25
06:40:40
08:00:16
08:51:29
10:17:14
10:47:58
10:52:33
10:57:00
11:55:01
12:48:44
13:08:25
13:23:37
13:39:39
13:54:30

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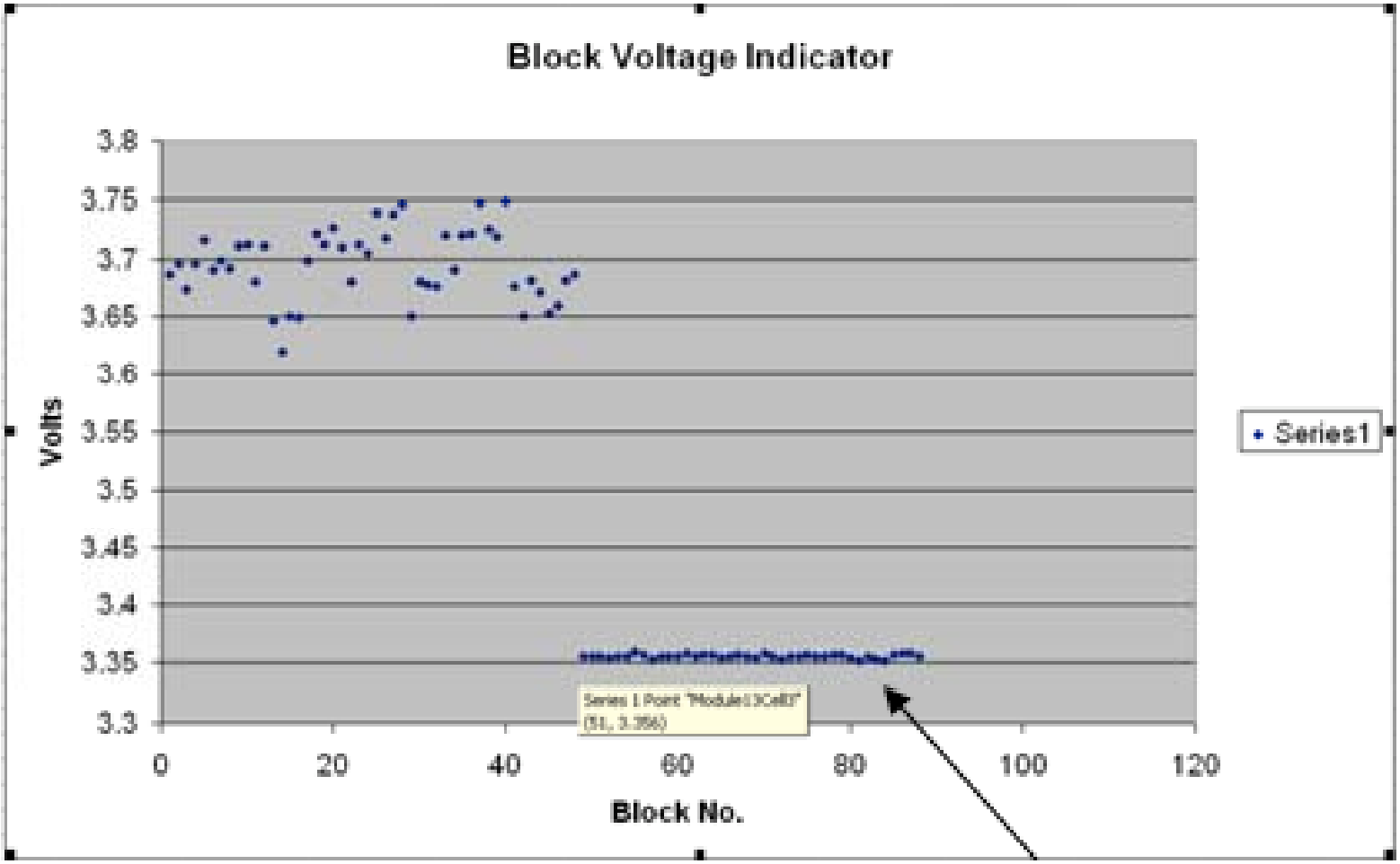
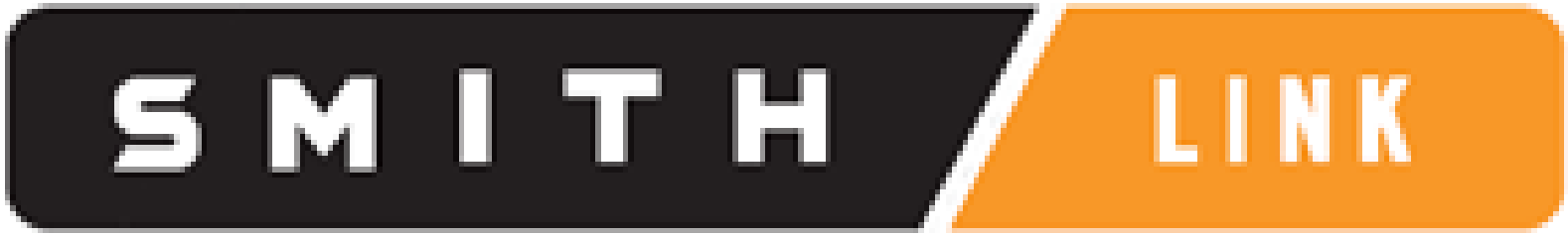

Block Voltage Indicator
Volts
3.8
3.75
3.7
3.65
3.6
3.55
3.5
3.45
3.4
3.35
3.3
0
20
40
60
80
100
120
Block No.
Series1

ANY QUESTIONS?



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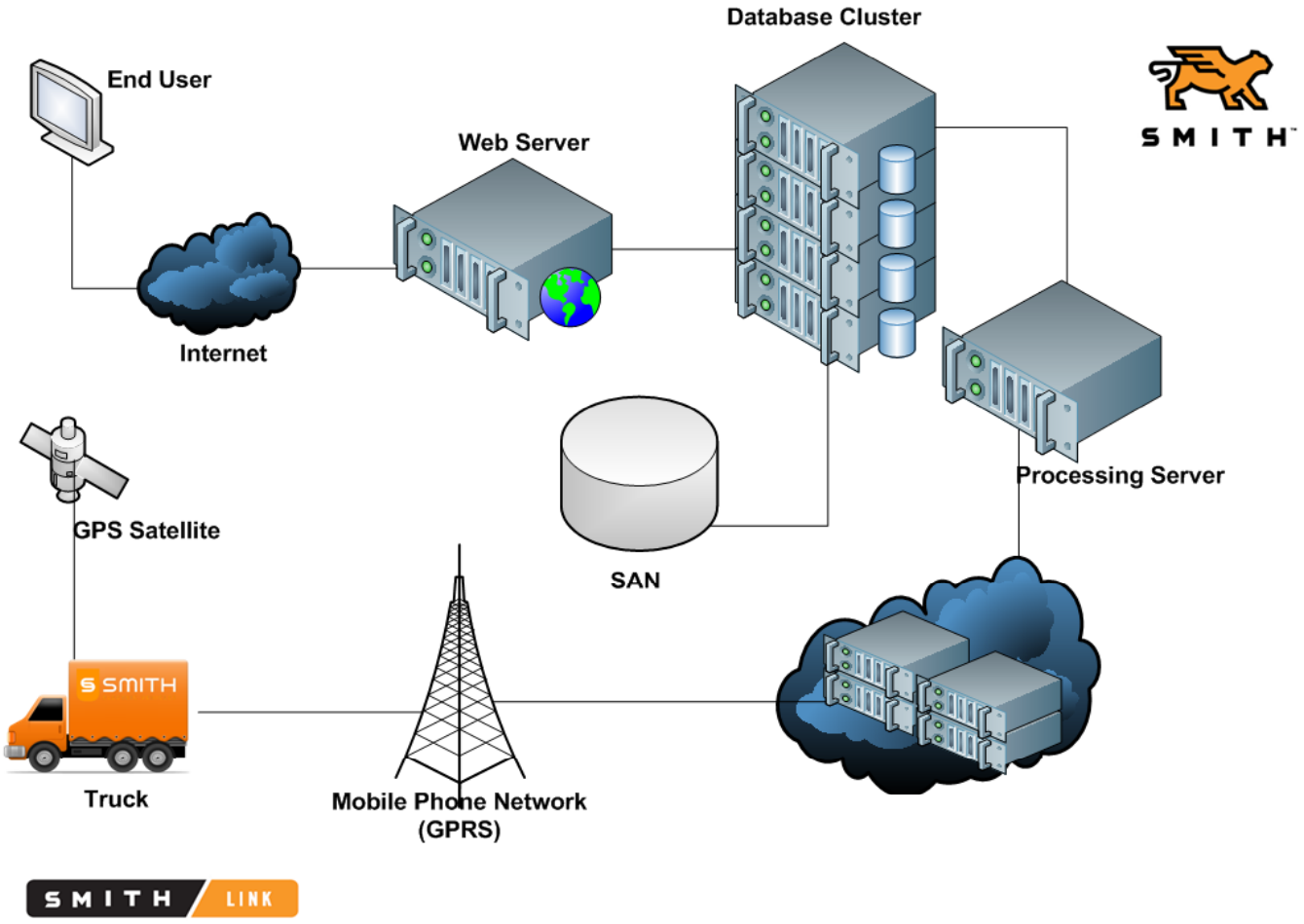
Security:

- Data transfer:
  - Truck transmissions: AMQP (2048 AES)
  - Server transmissions: SCP (2048 DES)
  - Web: SSL
- Data separation:
  - Access delegated to small subset of staff
  - Data given to partners is ammonised (under agreement with customers)

SMITH LINK


Database Cluster
End User
Web Server
SMITH
Internet
GPS Satellite
SAN
Processing Server
SMITH
Truck
Mobile Phone Network
(GPRS)
SMITH LINK