

2018

STS Instruments Ltd, Data Capture Manual

SILOXANE MONITOR MANUAL
STS INSTRUMENTS COPYRIGHT 2018

STS INSTRUMENTS LTD | www.siloxanemonitoring.com

TABLE OF CONTENTS




1.0	Manual Guide.....	2
1.1	Document Version.....	2
1.2	Symbols Used.....	2
1.3	Safety Information	3
1.4	Instrumentation Safety Symbols	3
2.0	Data OutPut	4
2.1	Key Features	4
3.0	Data hardware	4
3.1	4-20mA Data lines.....	4
3.2	Remote data	5
3.2.1	Remote Data connection	5
3.2.2	Access to remote data site	7
3.2.3	4-20mA Error Codes	10
3.3	Displayed Data	10
3.4	SD card	12

1.0 MANUAL GUIDE

1.1 DOCUMENT VERSION

Issued by	Author	Issue Date	Revision Number
STS Ltd	Jim Ward	13/10/2016	1.0
STS Ltd	Jim Ward	20/10/2016	1.1 Final
STS	Jim Ward	26/05/2017	1.2 4-20ma codes P9
STS	Jim Ward	15/02/2018	3.1 change to 4-20 powering and pin 1

1.2 SYMBOLS USED

	Safety Warning	Identifies potential hazards to either the user or the installation.	Failure to follow this information may result in physical injury that in some cases could be fatal, cause irrevocable damage to the instrument or damage to the environment.
	Electrical Hazard	Identifies specific electrical hazards to the user.	Failure to follow this information may result in physical injury that in some cases could be fatal or may cause irrevocable damage to the instrument.
	Notes	Identifies areas where clarification may be required.	

The following manual describes the provision of data, its access and retrieval.



Should at any point you require additional help or information on the use or installation of the system please contact STS directly at: sales@safetrainingsystems.com or +44 (0) 1344 483563

1.3 SAFETY INFORMATION



The STS Siloxane Monitor operates from a 110V mains supply, the instrument case should not therefore be opened without having first isolated the power supply and disconnected the kettle lead from the rear of the instrument. The high voltage section of the instrument is protected by clear cover - this should not be removed unless necessary- having followed the above instructions. FAILURE TO ISOLATE THE SUPPLY MAY RESULT IN ELECTRIC SHOCK.

It is the responsibility of the owner of the instrument to complete a risk assessment on its installation, operation and servicing before being commissioned for use.

Inhalation of gases may be harmful to health, it is the responsibility of the operator to ensure they have adequate training in the safety aspects of handling biogas/landfill gas and that they follow appropriate procedures at all times. The vent/exhaust from the instrument must be piped to an area designated safe to discharge to atmosphere- a flame arrestor may be required to be fitted.

Installation and Maintenance of the unit should only be carried out by suitably trained personnel according to the applicable code of practice.





Maintenance should be carried out only using STS approved replacement parts and components - use of substitutes will invalidate the warranty and may be hazardous to both operator and instrument.

No alterations should be made to the instrument or its ancillary components.

Failure to comply with the instructions in this manual could result in injury to the user.

The instrument captures fuel gas any work associated with the instrument must be carried out by a class of person competent and certified to do so.

1.4 INSTRUMENTATION SAFETY SYMBOLS

	Caution
	Electrical Hazard
	Earth Point
	Hot Surface

2.0 DATA OUTPUT

2.1 KEY FEATURES

There are several methods for outputting data from the Siloxane Monitor:

4-20mA data lines

Provided for the transfer of data to a 3rd party system.

Remote Data access

A data service accessible from any internet connection where individual or groups of monitors can be viewed to see current and trend data on a secure website. Email alerts to set alarm thresholds may be configured and data downloaded as CSV files.

Displayed Data

Data including the last reading and the previous 200 readings may be viewed on the screen in either table or graphical formats.

SD Card

All data is written to the SD card accessible from the front panel for download to pc

3.0 DATA HARDWARE

3.1 4-20MA DATA LINES

Data can be outputted from the Monitor using a 4-20mA output. This is an analogue output and requires setup on the customer's receiver.

This 4-20mA output uses an eight-way circular connector is provided at the rear of the monitor, for 16bit 4-20mV data output. The connector is colour coded BLUE, with a label: DATA COMMS.

The 4-20mA output is powered, requiring three lines:

Vin = 12- 24V

Iout = Current output.

Gnd = 0V in relation to Vin.

There are four separate 4-20mA output lines on this connector. The pin outs for this Rear BLUE Connector are:

Rear PIN	PCB	Label
1	CONN25 PIN 1	+24V
2	CONN4 PIN 1	Transmitter 1 +Vin
3	CONN4 PIN 2	Transmitter 1 Iout
4	CONN5 PIN 1	Transmitter 2 +Vin
5	CONN5 PIN 2	Transmitter 2 Iout

6	CONN6 PIN 1	Transmitter 3 +Vin
7	CONN6 PIN 2	Transmitter 3 Iout
8	CONN7 PIN 1	Transmitter 4 +Vin
9	CONN7 PIN 2	Transmitter 4 Iout
10	CONN25 PIN 2	GND

These four 4-20mA transmitters are assigned to the following:

T1 = Sample feed 1

T2 = Sample feed 2

T3 = Sample feed 3

T4 = Error (Active low)

The transmitter is unpowered and requires a voltage in of 12-24V.

The sample feeds are controlled by the siloxane monitor, switching valves inside the kiosk. If no such valves are used, only Sample feed 1 is active.

Once powered the instrument will set all T lines low, including T4. This is to indicate that the monitor is not currently logging. Only once the monitor starts its logging cycle does the T4 Error line, go high.

The conversion from mA to mg/m³ is as follows:

$$\text{Concentration(mg/m}^3\text{)} = \left[(\text{Iout} - 4) * \frac{(\text{ConcMax} - \text{ConcMin})}{16} \right] + \text{ConcMin}$$

Where Iout is the measured current. ConcMax and ConcMin are the upper and lower limit ranges of the concentration. This is set internally in the instrument. Typically set at 0mg/m³ to 100mg/m³.

3.2 REMOTE DATA

3.2.1 REMOTE DATA CONNECTION

A GSM communications box, connected via the 4-20mA output can be used to upload the latest reading data to a secure web account. This allows for remote viewing of the data.

Connecting to the rear BLUE data communications connector as follows:

PCB Connectors to Rear Connector:

Rear PIN	PCB	Label
1	CONN25 PIN 1	Vcc +24V
2	CONN4 PIN 1	M1 +
3	CONN4 PIN 2	M1 Iout
4	CONN5 PIN 1	M2 +

5	CONN5 PIN 2	M2 lout
6	CONN6 PIN 1	M3 +
7	CONN6 PIN 2	M3 lout
8	CONN7 PIN 1	M4 +
9	CONN7 PIN 2	M4 lout
10	CONN25 PIN 2	GND

These are uniquely wired.

Rear plug connector to Metron2 Plug Cable:

Rear PIN	Cable Wire
1	Red
2	Purple
3	White
4	Grey
5	Yellow
6	Brown
7	Orange
8	Green
9	Blue
10	Black

Using a 10way Shielded Multicore Cable

Cable to Metron2 Terminals

Cable Wire	Metron2
Red	Power +
Purple	Input 1 +V
White	Input 1 IN
Grey	Input 2 +V
Yellow	Input 2 IN
Brown	Input 3 +V
Orange	Input 3 IN
Green	Input 4 +V
Blue	Input 4 IN
Black	Power -

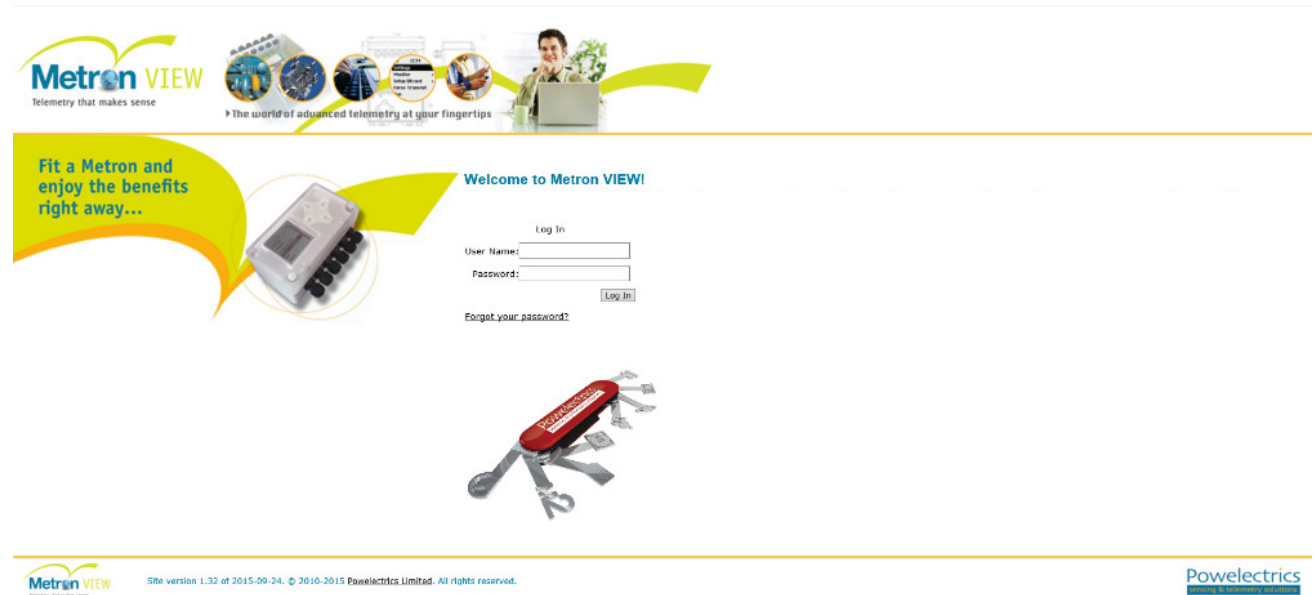
The data communications box can either be powered via the 12 way connector at 24V or via a alternative UPS supply at 110/240V.

The data communications unit contains a multi carrier Sim card for transmission of data to the 3rd party hosted web site. The site is accessed using a set user name and password allowing access only to that user's data.

User accounts are managed and access rights granted by STS on approval of the monitor owner.

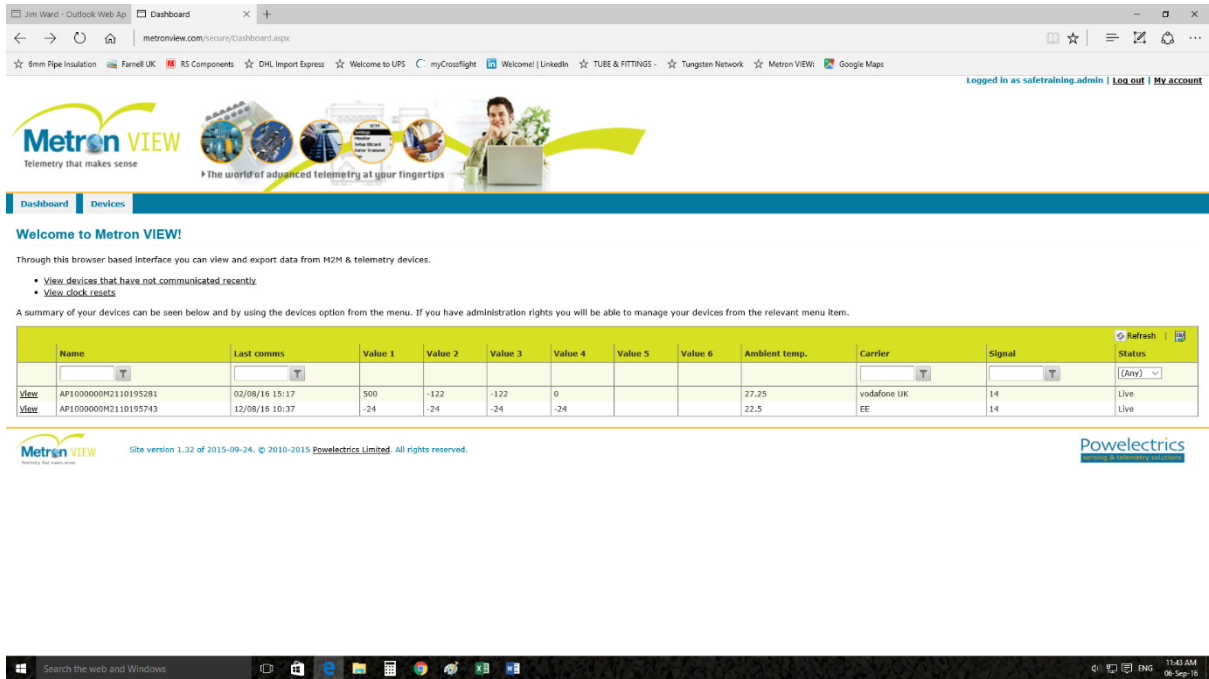
3.2.2 ACCESS TO REMOTE DATA SITE

Logon to data site - www.metronview.com



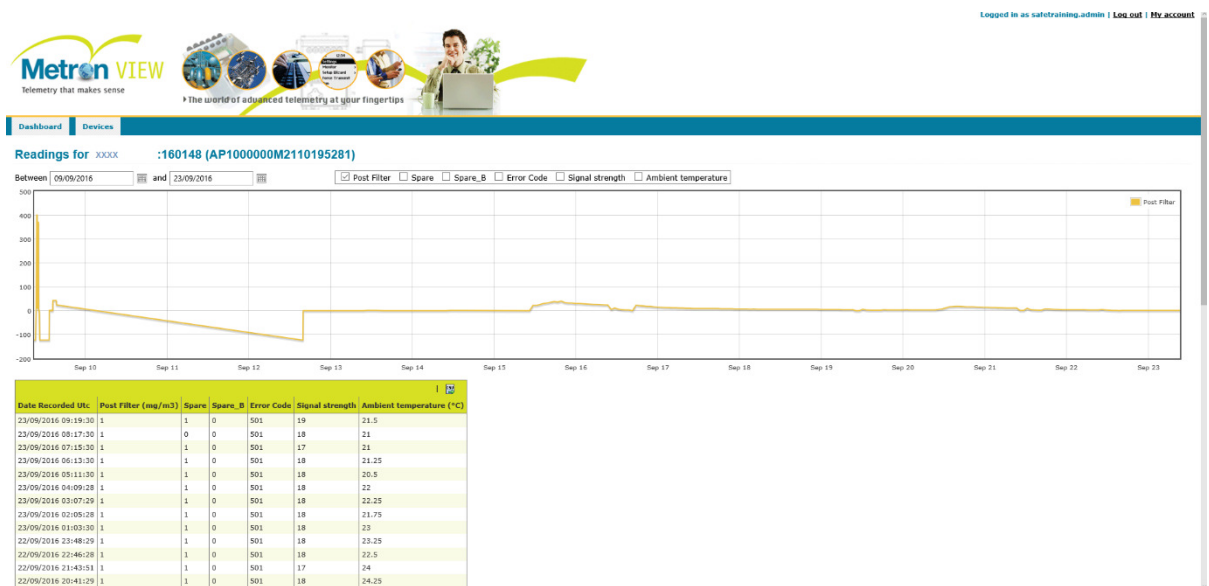
Input login and password as provided separately to this document.

The home screen will then display all the devices to which you have viewing rights.




Click on the view icon on the left hand side of an entry to see the data for that device.

Select the data date range from the calendar icons at the top of the graph. The selected data is then displayed as a graph and a table as below.



To download the data as a csv file click on the csv file icon on the top right hand corner of the data table

				
b)	t3 (%)	t4 (%)	Signal strength	Ambient temperature (°C)
	-122	0	14	27.25
			15	26.25
			16	26
			16	26
			16	26.25
			14	26.25
			14	26
			14	26
			15	26
			15	26
			14	26

The data is downloaded as a csv file in this format:

A	B	C	D	E	F	G	H	I
Date Recorded Utc	t1 (%)	t2 (%)	t3 (%)	t4 (%)	Signal strength	Ambient temperature (°C)		
02-08-16 15:17	500	-122	-122	0	14	27.25		
02-08-16 15:10	500				15	26.25		
02-08-16 15:07	500				16	26		
02-08-16 15:04	500				16	26		
02-08-16 14:59	500				16	26.25		
02-08-16 14:57	500				14	26.25		
02-08-16 14:53	500				14	26		
02-08-16 14:51	500				14	26		
02-08-16 14:48	500				15	26		
02-08-16 14:45	500				15	26		
02-08-16 14:42	500				11	26		
02-08-16 14:39	500				9	26		
02-08-16 14:36	500				12	26		
02-08-16 14:33	500				13	26		
02-08-16 14:29	500				14	26		
02-08-16 14:27	500				13	26		
02-08-16 14:24	500				15	26		
02-08-16 14:20	500				12	26		
02-08-16 14:18	500				12	26		

3.2.3 4-20mA ERROR CODES

Error line 4-20mA reading:

0: Standby

25: Communications Fault

50: Fan Fault

75: CH4 High Fault

100: N2 Fault

125: Internal Temp Fault

150: Biogas Volume Fault

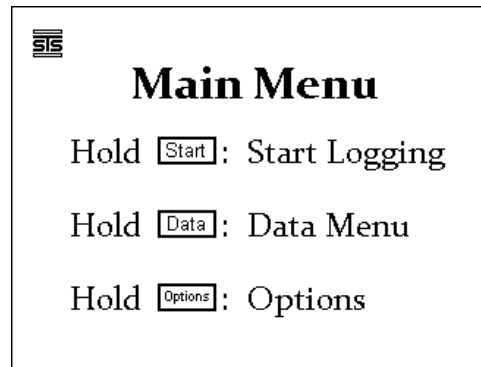
175: Concentrator Temp Fault

200: Logging Normally

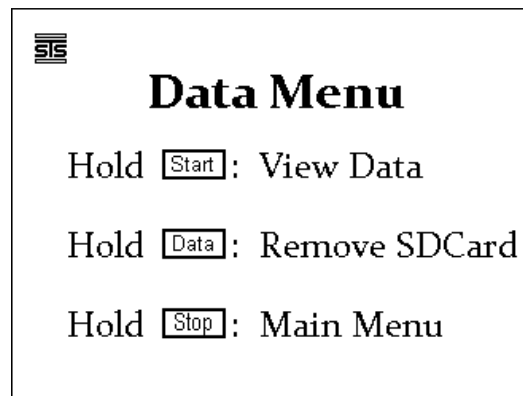
3.3 DISPLAYED DATA

Historic data from the instruments current logging session, since powered, can be displayed on screen.

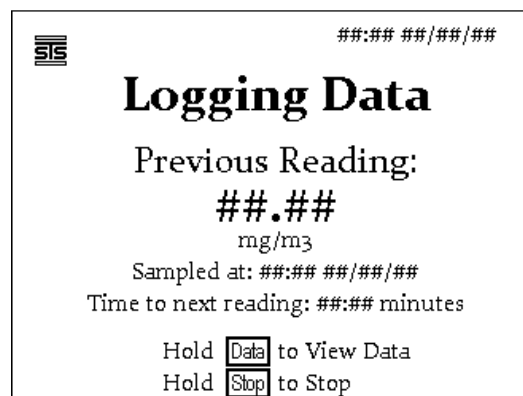
There are two methods for viewing this data, the first is from the main menu of the instrument, Holding DATA:



Then hold START to enter the data display.



Or via the main logging screen:

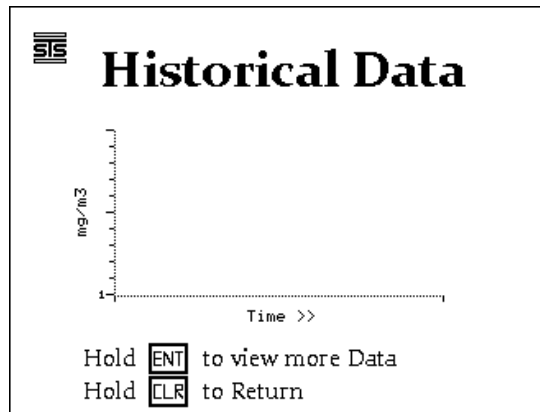


Hold Data to display the Historical readings.

In the data menu hold Start to view the stored data.

Inside this menu you can view the previous 200 readings since powered and put the instrument into a state ready for SD Card removal.

Holding **DATA** will display a Bar Graph of the last 200 readings since powered, auto scaled to the highest concentration or 5mg/m³, whichever is higher.



- Hold **ENTER** again to view these concentrations and their timestamps. Holding **ENTER** will cycle through pages, **CLEAR** will return to Main Menu.

Historical Data

ID#	Conc.(mg/m ³)	Date/Time

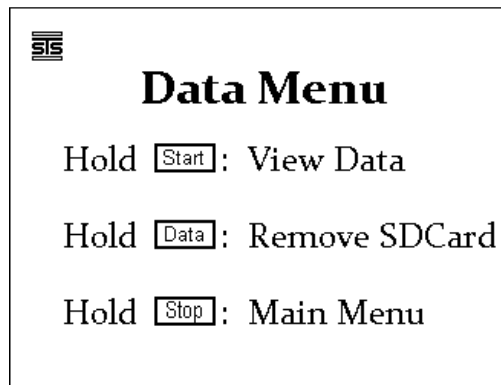
Hold **ENT** to view more Data
Hold **CLR** to Return

3.4 SD CARD

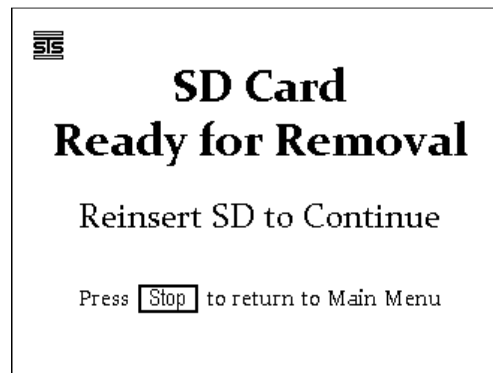
In addition to the previous outputs, data is written constantly to the onboard SD card. This may be accessed by removal of the SD card and download to a pc/laptop.



To remove the card go to the main menu and select Data.



- Holding **DATA** will Prepare the instrument for SD Card removal. (Hold **STOP** to return to main menu without removing card).



Once the data has been downloaded the card should be replaced in the Slot and press stop to return the instrument to the main menu screen.



The instrument will not run without the SD card being inserted - please ensure it is re-inserted correctly after data download.

The Card will contain the stored data under the folder **/RESULTS**.

In this folder there will be a .CSV file, titled with the ID label, which can be opened with **MS EXCEL**.

These files will have a numerical subscript, increasing as the data accumulates. Each .CSV file contains 99 data reading.

This .CSV file contains detailed variables of the instrument operation. The values of Concentration, Final Mass, and Sample Volume will be the most relevant. Other values are valuable for STS analysis, but can be switched off if necessary

Additional optical Bench data is logged in the **/GRAPHS** folder.

It is recommended that the SD card Data is removed and backed up into external storage. **As data is accumulated onto the card, the speed at which the Data can be written decreases.**

Example data file

_13 - Notepad

File Edit Format View Help

_13.TXT

SampleID,Concentration(mg/m3),TotalMass(ug),PositiveMass(ug),DriftMass(ug),NegativeMass(ug),SampleVolume(ml),AnalysisFlow(ml/min),StartmV,FinalmV,SampleDateTime

```

13.1,1.586,1.916,1.736,-0.646,-0.466,1208.154,50.128,3163.881,3168.181,10/12/15 15:53:34
13.2,1.441,1.741,1.706,-0.556,-0.521,1207.941,50.326,3166.506,3170.193,10/12/15 16:57:17
13.3,1.491,1.801,1.727,-0.586,-0.513,1207.347,50.203,3166.468,3170.369,10/12/15 18:01:01
13.4,1.472,1.776,1.718,-0.485,-0.428,1206.419,50.312,3166.956,3170.175,10/12/15 19:04:47
13.5,1.432,1.730,1.632,-0.683,-0.585,1208.063,50.210,3164.700,3169.237,10/12/15 20:08:30
13.6,1.353,1.636,1.560,-0.647,-0.572,1208.793,50.163,3165.937,3170.244,10/12/15 21:12:14
13.7,1.384,1.672,1.560,-0.634,-0.522,1207.673,50.245,3166.131,3170.344,10/12/15 22:16:00
13.8,1.349,1.630,1.538,-0.677,-0.585,1207.470,50.252,3165.644,3170.137,10/12/15 23:19:46
13.9,1.385,1.671,1.577,-0.579,-0.485,1206.033,50.282,3165.469,3169.312,11/12/15 00:23:32
13.10,1.431,1.725,1.630,-0.553,-0.458,1205.224,50.402,3166.475,3170.137,11/12/15 01:27:19
13.11,1.375,1.660,1.563,-0.669,-0.573,1206.723,50.295,3165.162,3169.600,11/12/15 02:31:00
13.12,1.339,1.614,1.551,-0.621,-0.559,1205.287,50.363,3167.600,3171.718,11/12/15 03:34:41
13.13,1.328,1.602,1.509,-0.673,-0.581,1206.307,50.292,3166.356,3170.825,11/12/15 04:38:24
13.14,1.308,1.573,1.505,-0.637,-0.568,1203.265,50.504,3168.837,3173.050,11/12/15 05:42:09
13.15,1.394,1.681,1.556,-0.636,-0.511,1205.983,50.432,3167.369,3171.575,11/12/15 06:45:54
13.16,1.316,1.585,1.457,-0.749,-0.621,1204.180,50.614,3170.256,3175.200,11/12/15 07:49:37
13.17,1.472,1.778,1.652,-0.594,-0.467,1208.231,50.550,3171.375,3175.300,11/12/15 08:53:20
13.18,1.344,1.624,1.512,-0.639,-0.528,1208.223,50.568,3168.687,3172.906,11/12/15 09:57:05
13.19,1.328,1.603,1.572,-0.551,-0.520,1206.755,50.645,3168.144,3171.775,11/12/15 11:00:51
13.20,1.484,1.786,1.725,-0.615,-0.554,1203.236,50.193,3163.581,3167.668,11/12/15 12:04:35
13.21,1.470,1.774,1.754,-0.577,-0.557,1207.194,50.599,3165.981,3169.787,11/12/15 13:08:20
13.22,1.383,1.669,1.723,-0.366,-0.420,1207.191,50.591,3166.406,3168.818,11/12/15 14:12:06
13.23,1.453,1.752,1.699,-0.585,-0.531,1205.798,50.517,3166.312,3170.175,11/12/15 15:15:54
13.24,1.372,1.654,1.574,-0.633,-0.554,1205.181,50.652,3168.094,3172.269,11/12/15 16:19:42
13.25,1.186,1.432,1.369,-0.746,-0.683,1207.375,50.666,3169.162,3174.081,11/12/15 17:23:29
13.26,1.150,1.387,1.307,-0.675,-0.595,1206.401,50.906,3170.894,3175.325,11/12/15 18:27:17
13.27,1.095,1.318,1.255,-0.656,-0.593,1203.132,51.003,3171.275,3175.568,11/12/15 19:31:04
13.28,1.033,1.243,1.188,-0.684,-0.629,1202.963,51.012,3172.587,3177.068,11/12/15 20:34:51
13.29,1.056,1.271,1.174,-0.717,-0.620,1204.163,51.012,3172.031,3176.731,11/12/15 21:38:40
13.30,1.039,1.251,1.161,-0.751,-0.661,1203.940,51.074,3172.512,3177.425,11/12/15 22:42:29
13.31,0.977,1.178,1.107,-0.779,-0.709,1205.205,51.070,3173.237,3178.337,11/12/15 23:46:19
13.32,0.916,1.104,1.084,-0.691,-0.671,1205.516,51.098,3172.968,3177.487,12/12/15 00:50:09
13.33,0.935,1.129,1.070,-0.766,-0.706,1208.408,50.899,3174.869,3179.900,12/12/15 01:53:59
13.34,0.919,1.111,1.058,-0.735,-0.682,1208.566,50.951,3174.906,3179.731,12/12/15 02:57:51
13.35,0.883,1.068,1.050,-0.644,-0.627,1209.309,51.048,3175.656,3179.881,12/12/15 04:01:42

```

Graph Data:

TW_GRAPH_1.1.TXT

uV
3123400
3128587
3128900
3129275
3127837
3129150
3128275
3128837
3127899
3128025
3128150
3128837
3128150
3128275
3128587
3129025
3128337
3127899
3128462
3128712
3128837
3127775
3128337
3127525
3128400
3127462
3127712
3128150
3128462
3128150
3127087
3128462
3128275
3128400
3127525

_GRAPH_1.67.TXT uV

