



Technical Training

Datalogging in an IPm Controller

MAY 2010

FLEXIBLE. RELIABLE. POWERFUL.

Datalogging Requirements

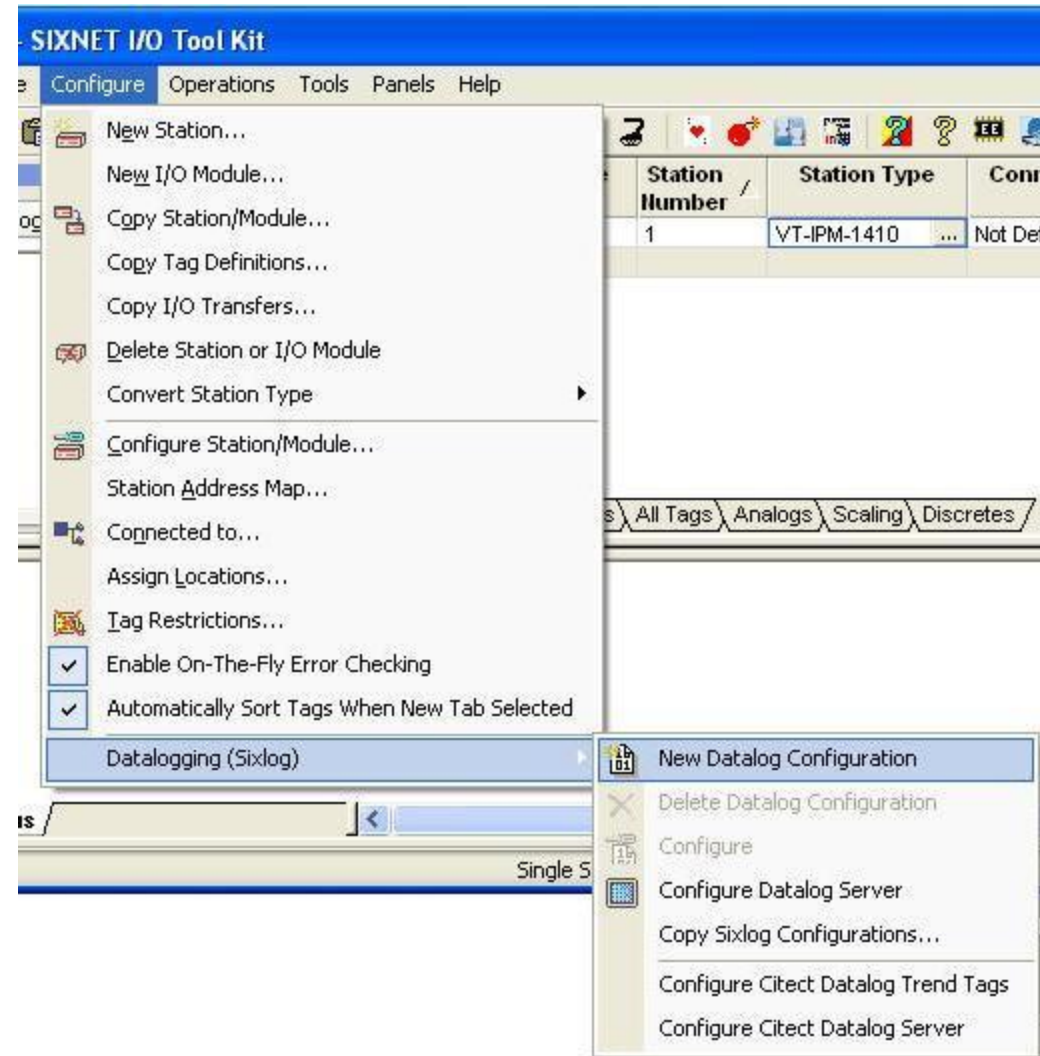


- **SIXNET IO Tool Kit Installed (includes datalog server)**
- **Datalogging Licensing**
- **Any IPm Controller**

Getting Started



- **Create New Tool Kit project**
- **Add IPM to project**
- **Assign tags to Onboard IO, or add tag to virtual IO modules**
- **Add a new Datalog configuration to station**



New Datalog Configuration



- Add Name
- Select timestamp format
- Next

The image shows a software dialog box titled "Data Log Configuration: Station: NewSta1". The dialog has a blue title bar with a close button in the top right corner. The main area is light beige and contains the following fields and controls:

- Station name:** NewSta1
- Datalog configuration name:** Add Name
- Timestamp format:** A dropdown menu with a blue arrow pointing down. The selected option is "'MM/DD/YY HH:MM:SS'". A list of other options is visible below the dropdown:
 - 'MM/DD/YY HH:MM:SS'
 - 'DD/MM/YY HH:MM:SS'
 - 'YY/MM/DD HH:MM:SS'
 - 'MM/DD/YY',HH:MM:SS'
 - 'DD/MM/YY',HH:MM:SS'
 - 'YY/MM/DD',HH:MM:SS'
 - ANSI C
 - Spreadsheet
- Backup datalog configuration:** This label is present but has no associated input field.

At the bottom of the dialog, there are four buttons: "Red/Yellow Help" (with a red and yellow question mark icon), "< Back", "Next >", "Cancel", and "Help".

Capture Parameters



- **Number of records**
 - How much can I log?
- **Choose log rate**
- **Log on event**
 - Controlled by ISaGRAF or alarm
- **Log stop control**
 - Enable or disable logging via Discrete register
- **Action when full**
- **Memory locations**
 - Battery backed or flash

The screenshot shows a software dialog box titled "Capture Parameters". It contains several configuration options:

- Number of records:** A text input field containing the value "100".
- Record capture control:** A section containing:
 - Define fixed log rate**: A sub-section with:
 - Timed log rate:** A text input field with "1.00" and a "Seconds" label.
 - Synchronize to:** A time selection field showing "12:00:00 AM".
 - Log on event name:** A text input field containing "eventname".
 - Log/Stop control:** A dropdown menu.
- Action when full:** A section with two radio buttons:
 - Cyclic buffer**
 - Save until cleared**
- Memory location:** A dropdown menu showing "nvram (default)".

At the bottom of the dialog, there is a "Red/Yellow Help" button on the left and four navigation buttons: "< Back", "Next >", "Cancel", and "Help".

How Much Can You Log



STEP 1.

- Observe the total number of bytes per datalog record
- The Record Content window includes a display of the total number of bytes each record

STEP 2.

- Calculate the number of datalog records stored per day
- Example: 1440 minutes per day \div 10 minute (logging rate)
= 144 datalog records per day

STEP 3.

- Calculate the total number of bytes per day
- Example: 144 records x 54 bytes per record x 1.10 (10%)
= 8554 total bytes per day

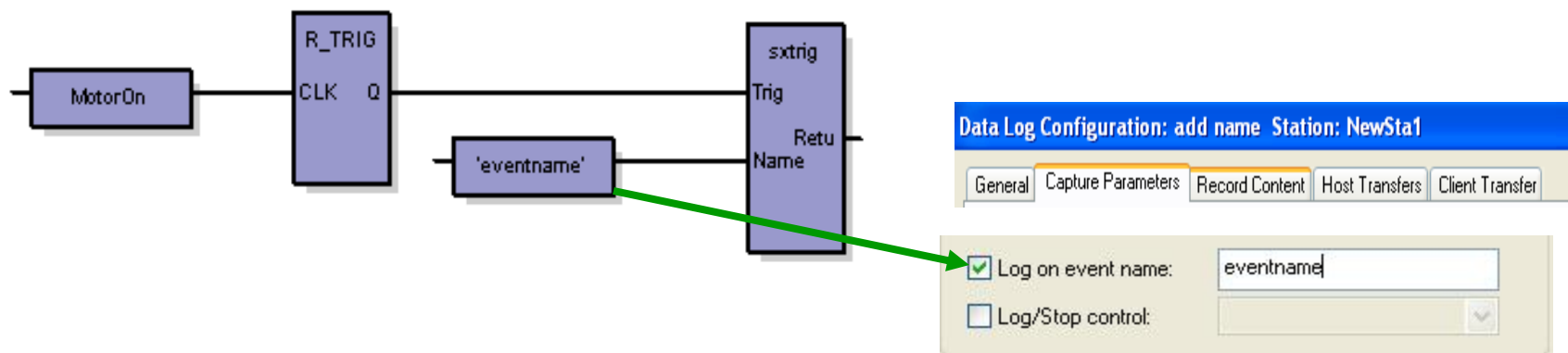
STEP 4.

- Calculate how many days you can log data before reaching a given file size
- Example: 400,000 bytes \div 8554 bytes per day @ 46.75 days

Logging on Event



- One log file per event
- Program the event using the sxtrig function in ISaGRAF
- Assign the sxtrig “Name”
- Use the sxtrig “Name” as the Event Name in the Dlog configuration



Memory Location



- **NVRAM: records stored in battery backed memory**
 - 10 mS log rate max, 30mS for most system
 - Up to 2 meg memory available (see product spec)
- **Flash: records stored in flash memory**
 - 1 S max log rate
 - Up to 118+ meg available (see product spec)
 - Note: Memory varies between controllers
 - Options: 2meg > 6 meg > 20 meg > 54 meg > 118 meg

Memory location:

A screenshot of a web interface showing a dropdown menu for "Memory location". The menu is open, displaying three options: "nvram (default)" (highlighted in blue), "nvram (default)", and "flash". A small blue downward arrow is visible in the top right corner of the dropdown box.

nvram (default)
nvram (default)
flash

Record Content



- Pre-assigned tags readily available
- Highlight tags & Add
- Add Timestamp
- Content setup is complete
- Total Bytes in record
(use this value to calculate storage abilities)

Data Log Configuration: add name Station: NewSta1

General Capture Parameters **Record Content** Host Transfers Client Transfer

Select I/O points to be logged:

I/O Address	I/O Tag Name	Tag Description
AX0	Datalog0	
AX1	Datalog1	
AX2	Datalog2	
AX3	Datalog3	
AX4	Datalog4	
AX5	Datalog5	
AX6	Datalog6	

Additional variables: time

Record definition (each record will contain this information):

Status	Data Field Contents	Data Type	Field Count	Byte Count
OK	Datalog0	16-bit Integer	1	2
OK	Datalog1	16-bit Integer	1	2
OK	Datalog2	16-bit Integer	1	2
OK	Datalog3	16-bit Integer	1	2
OK	Datalog4	16-bit Integer	1	2
OK	time	Time	1	4

Total bytes in each record: 14

Host Transfer



- **Host site will request records from station**
- **Use the Tool Kit to read records**
- **Launch `sxlogview.exe`**
 - User programs C, Visual Basic etc.
 - The "Run" command in Windows and other applications
 - Batch file
 - Other applications capable of running Windows commands

The screenshot shows the "Data Log Configuration" software interface. The title bar reads "Data Log Configuration: add name Station: NewSta1". There are five tabs: "General", "Capture Parameters", "Record Content", "Host Transfers" (which is selected), and "Client Transfer".
Under the "Host Transfers" tab, the "Transfers defined:" section shows a dropdown menu with "NewXfer1" selected. To the right are buttons for "Create New Transfer" and "Delete this Transfer". Below this is a "Rename" button.
The "PC file name:" field contains the path "C:\DatalogFiles\September2009\Cont" and has a folder icon to its right.
The "Transfer action" section has four radio button options: "Append" (selected), "Append and erase data older than" (with a "0" in a text box and "Hours" label), "Erase and store new", and "Sequential filename" (with a "Next number:" label and a "0" in a text box).
The "Float precision:" field has a "0" in a text box and "Decimal places" label.
There is a checkbox for "Synchronize station clock after transfer" which is unchecked.
The "Method:" dropdown menu is set to "Use Computer's GMT".
At the bottom, there are two more checkboxes: "Store timestamps as GMT (requires GMT set in station's clock)" and "Store scaled analog values", both of which are unchecked.

Client Transfer



- RTU initiates record transfer to the server

Data Log Configuration: add name Station: NewSta1

General Capture Parameters Record Content Host Transfers Client Transfer

Client Transfer Name: ClientXfer1 [Create New] [Rename] [Delete Transfer]

Records to send

All records since the last transfer

Most recent records

All records for the past minutes

Define fixed transfer rate

Timed rate: Seconds

Synchronize to start at:

Transfer on event name:

Start/Stop control:

Set transfer complete tag:

Communications

Port:

Destination station number:

Destination IP:

Timeout: mS

Retry count: Retries

IP port number:

Station identifier:

[Red/Yellow Help] [OK] [Cancel] [Help]

Client Transfers



- **SIXNET serial and Ethernet client transfers supported**
- **Ethernet SIXNET TCP and UDP**
- **Ethernet FTP and FTPS protocol**
- **Scheduled transfers, Event based or Start / Stop controlled**

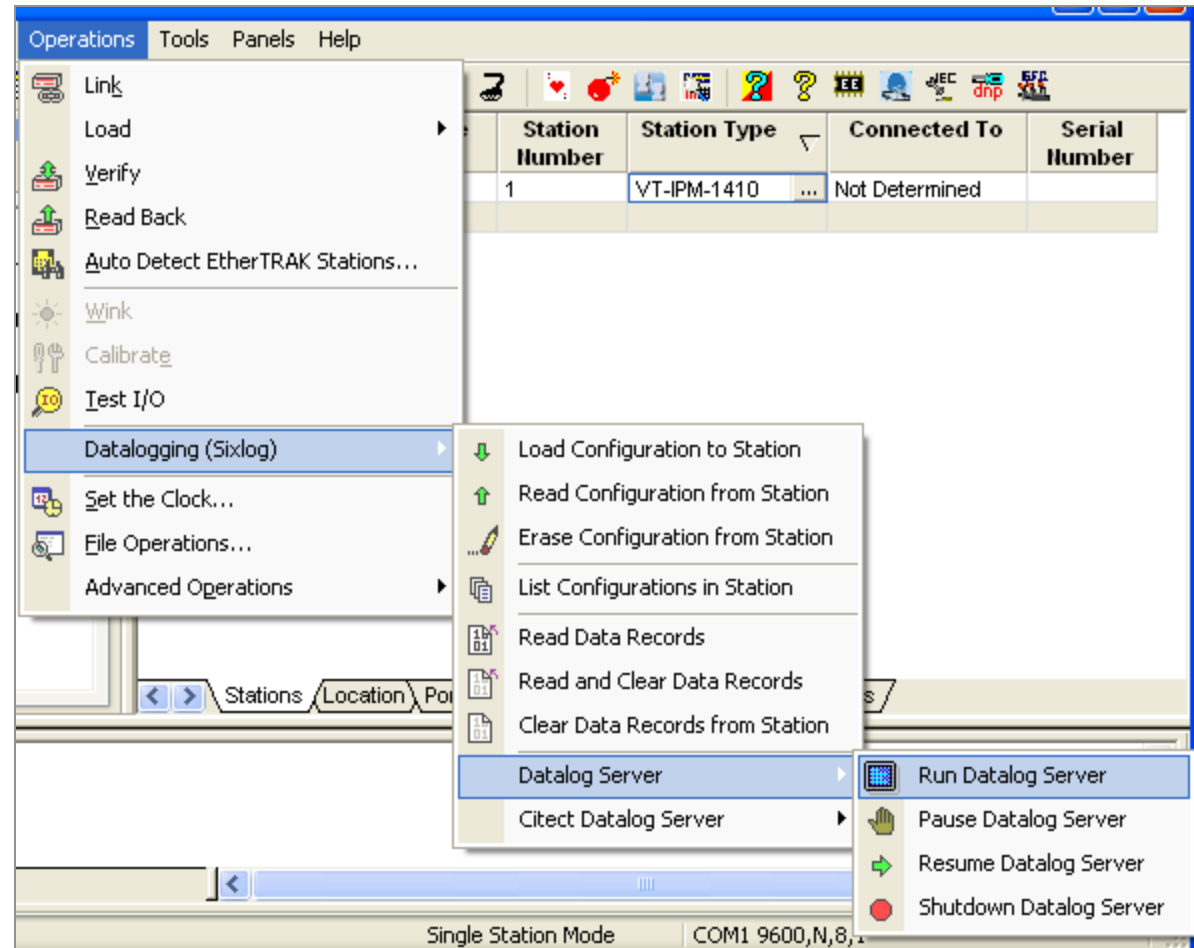
Note: Combinations of above also supported - flexible

- **Client transfer redundancy supported**
- **Datalog server must be running on PC**

What does the datalog server do?



- **Receives log files from RTUs**
- **Stores a CSV file**
- **Organizes data log records**
- **Diagnostic Tool**
- **Shows statistic (history)**



Datalog Sever Setup



- **Option to allow specified stations only**

- **New file creation method**

– Configurable

- **Data file base name**

– Configurable

- **Clock synchronization**

- **Log errors**

Configure Datalog Server

General | Client Transfers | UDP/TCP Ports | COM Ports

Client connection mode:

Only allow specified stations to log data

Allow new clients to automatically connect/log data

New file creation method:

Create new files: Weekly

Starting: Sunday

Data file location:

Directory: C:\DatalogFiles\September2009

Data file base name: <Station Name>

Sample: C:\DatalogFiles\

Clock adjustments:

Set station's clock when out of tolerance:

60 seconds Time format: Compare/Set Local Time

Data Format:

Store scaled data

Log files:

Log errors:

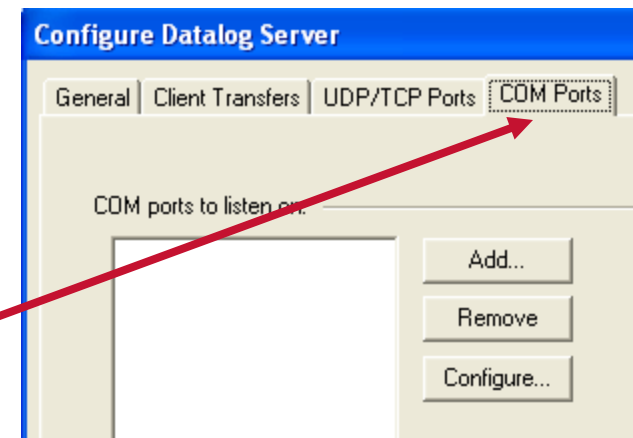
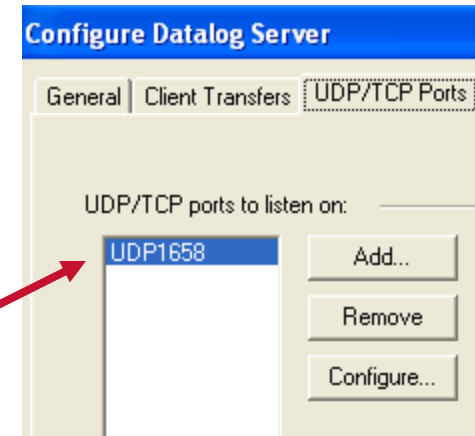
Directory:

OK Cancel Help

Datalog Server Communications



- **Using Ethernet match the IP port number with the IP port number defined in the IPm datalogging configuration**
- **Default port # is UDP1685**
- **IP ports Register to Sixnet**
 - Port 1594
 - Port 1658
- **COM Ports must match the datalog project file as well**

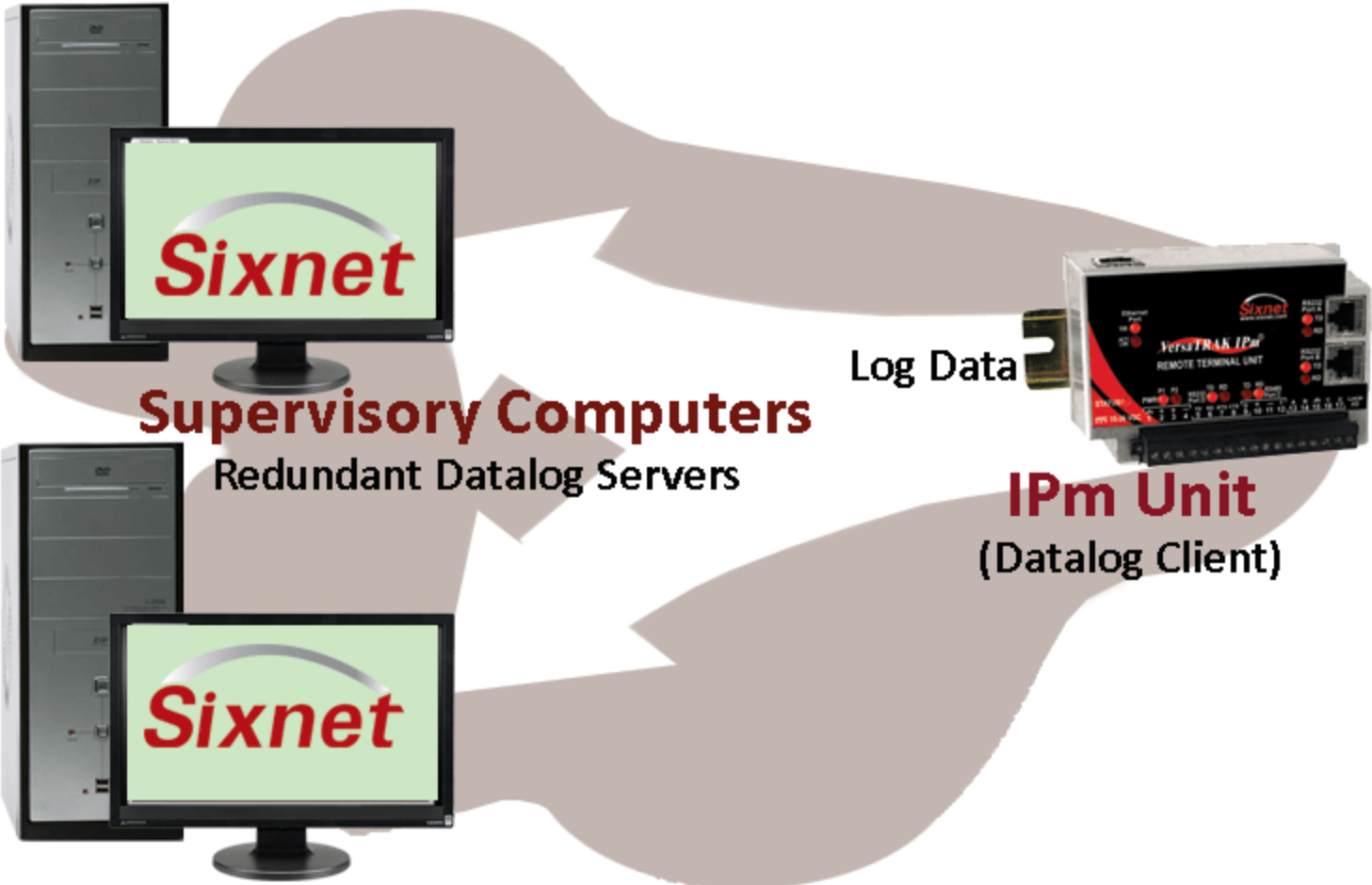


Flexibility & Redundancy Options

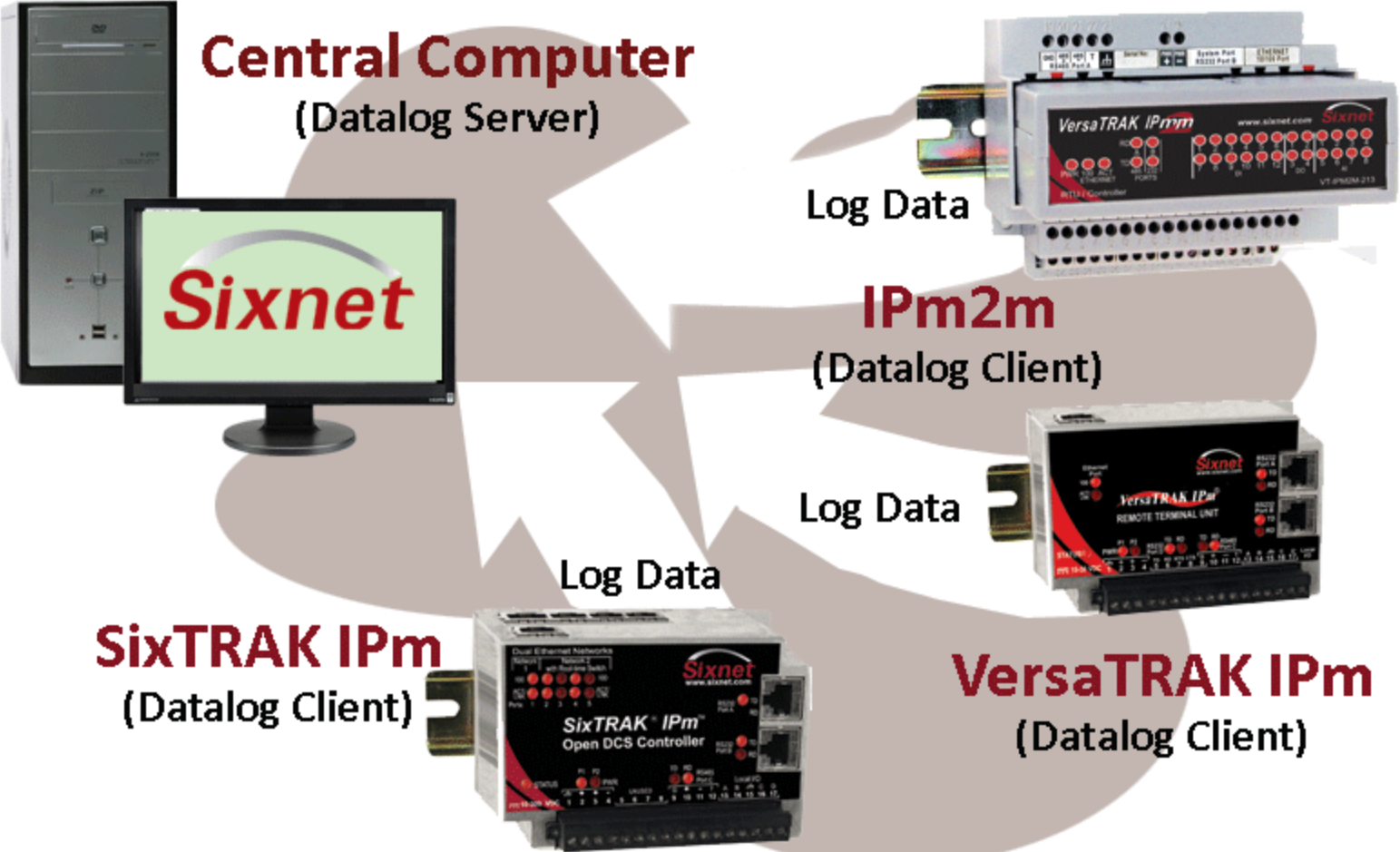


- **Multiple datalog files can be configured in an IPm controller**
- **Each configuration file can be uniquely configured**
- **Client transfers can be support per datalog configuration**
- **Limitation are specific to available memory**

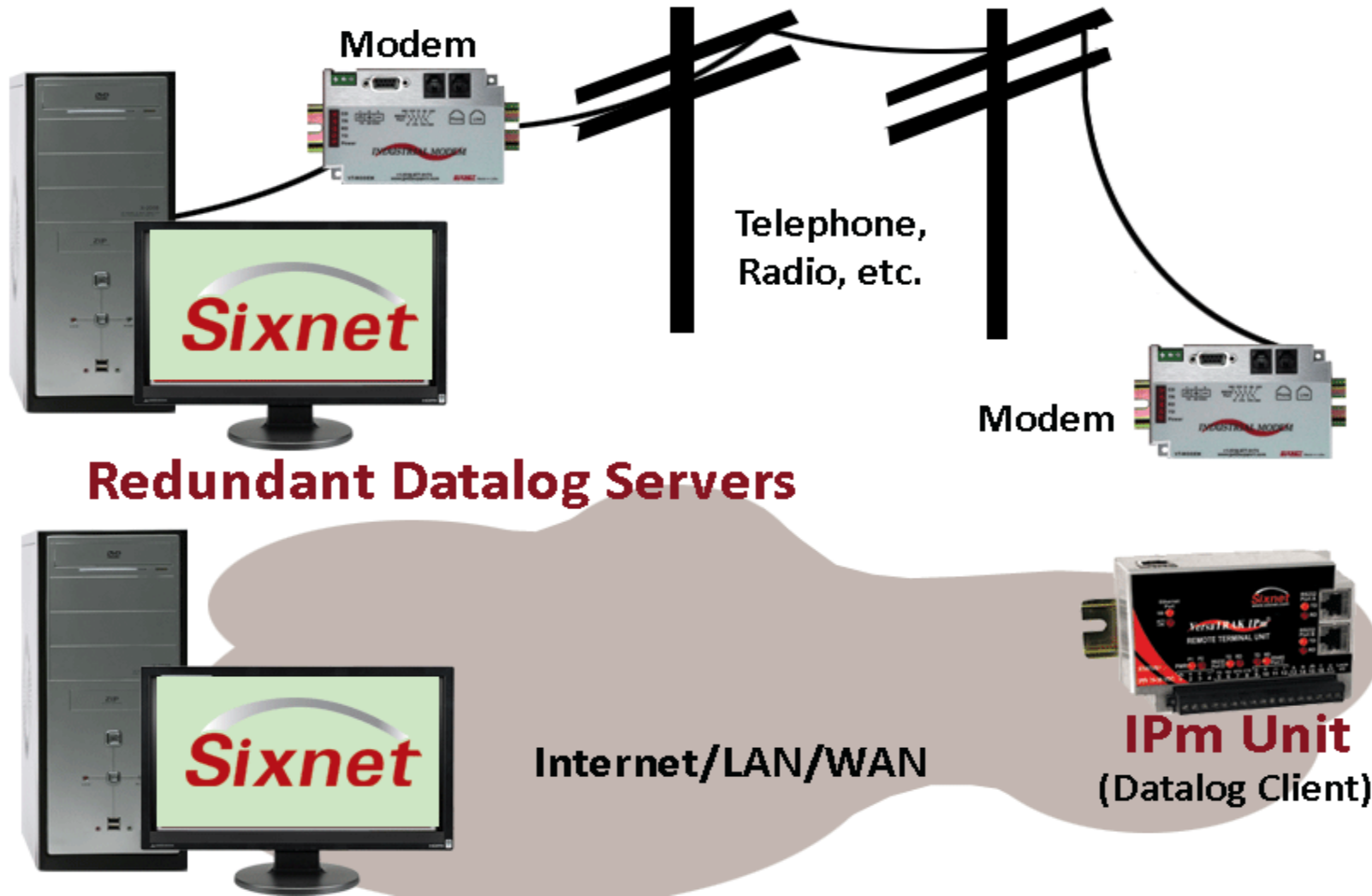
Redundant Example 1



Redundant Example 2



Redundant Example 3





Sixnet, LLC
331 Ushers Road
Ballston Lake, NY 12019

T +1 518 877 5173

F +1 518 877 8346

sales@sixnet.com

www.sixnet.com

FLEXIBLE. RELIABLE. POWERFUL.