

* Power Measurement Solutions by . . .



Specializing in turn-key Mission Critical Infrastructure Solutions & Customized
Power Distribution Manufacturing

Overview Prepared for:



Presented by Mark Neff, P.Eng.
Engineering Services Manager

* *The E.A. Group . . . overview*

- *Divisions*
 - Contracting & Maintenance Services
 - Manufacturing
 - Engineering Services

- *Strengths*
 - 40 years of Data Centre know-how, resulting in;
 - Common Sense philosophy
 - Un-matched customer service
 - Over 20 Years of installing Power Measurement metering
 - Staff factory-trained on ION Enterprise Administrator and Programmer



* *The E.A. Group . . . customers*



TSX group



* *Topics*

- *Working with 3rd Party Devices*

- What is ION
- Protocols
- Meter-Connected
- Server-Connected
- Vista Diagrams



- *Working with Large Systems*

- Communications Configurations
- Bandwidth Limitations
- Database Growth
- Mass Updates



* *The E.A. Group... Warnings*

- *This presentation shows you how to access and modify ION meters and ION Enterprise in ways that could cause unintended operation – any changes you make are at your own risk*
- *Due to changes in ION Enterprise from version to version and differences in meter capabilities, the described behaviour may not be the same as on your system*
- *If you are intent on making changes yourself to the Meter Framework, the VIP Framework or registry settings for ION Enterprise, we strongly suggest that you have purchased Premium Support*
- *This is an opportunity for me to learn too, so I welcome your corrections, suggestions and **constructive** criticisms*

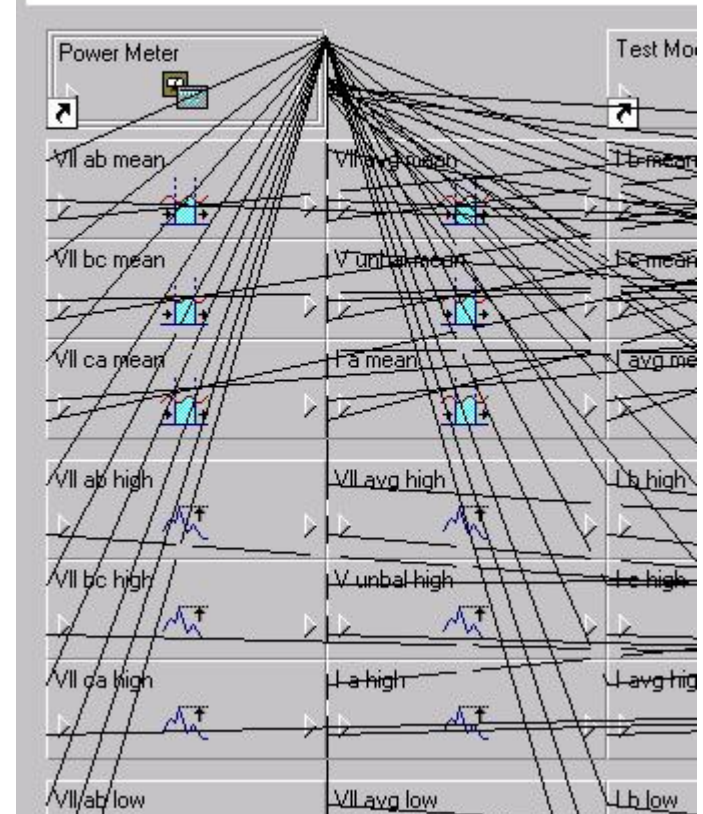
* *What is ION?*

- *Communications Protocol*
 - Proprietary (similarity to Modbus)

- *Programming*
 - Object Oriented
 - Visual Interconnection
 - Can do it through ION Setup, but ION Enterprise Designer is preferred
 - Patented
 - Program is called a 'Framework'

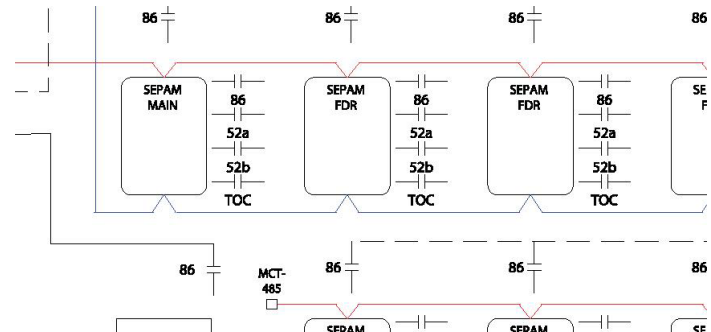
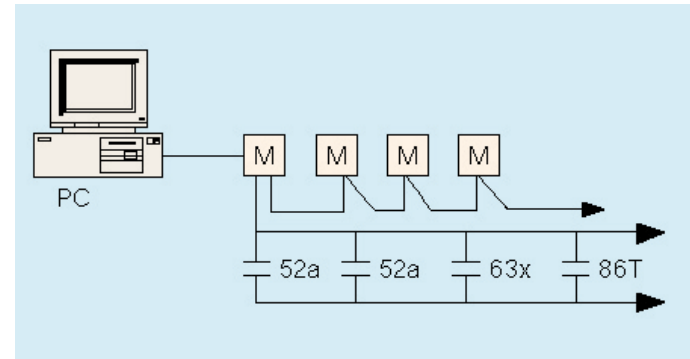
Historic Data Logging

Right-click a module to access its setup registers.



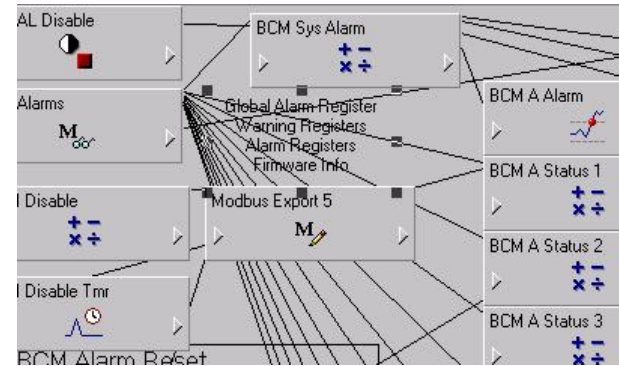
* *Protocols*

- *Modbus*
- *DNP*
- *LonWorks*
 - 7700
 - 7300 – Data Export Only
- *Profibus*
 - 7300 – Data Export Only
- *XML*
 - VIP Only – Data Import Only



* Meter-Connected Devices

- *I/O (Analog or Digital)*
- *Serial Port*
 - RS-232 (EIA-232)
 - RS-485 (EIA-485)
- *Accessed Directly By Meter*
 - Meter acting as Master
 - Modbus Master Options Module
 - Modbus Master Map
 - Modbus Import
 - Meter acting as Slave
- *Accessed by VIP using Ethergate*
 - VIP acting as Master
- *Meter Display Annunciation*



ALARMS		11/07/2005 3:22:04	
Freq Tolera	NORMAL (1)	Phase Rev	NORMAL (7)
Over Cune	NORMAL (2)	High Temp	NORMAL (8)
Neutral Cur	NORMAL (3)	Over Temp	NORMAL (9)
Over Volt	NORMAL (4)	Gmd Fault	NORMAL (10)
Under Volt	NORMAL (5)	THD Alarm	NORMAL (11)
Phase Loss	NORMAL (6)		
Inputs	Synchronized (12)		

ALARMS Volt/Ampr PowerSum Energy Demand

* *Server-Connected Devices*

- *VIP – Virtual Processor*
- *Modbus*
 - Serial Port
 - Ethernet Gateway Device
 - Lantronix
 - Direct Access as a Server
 - Access through Port Redirector
 - Modbus/TCP (Ethernet)
 - Not Supported by the VIP
- *Modbus Importer*
 - IONize your device
- *XML*



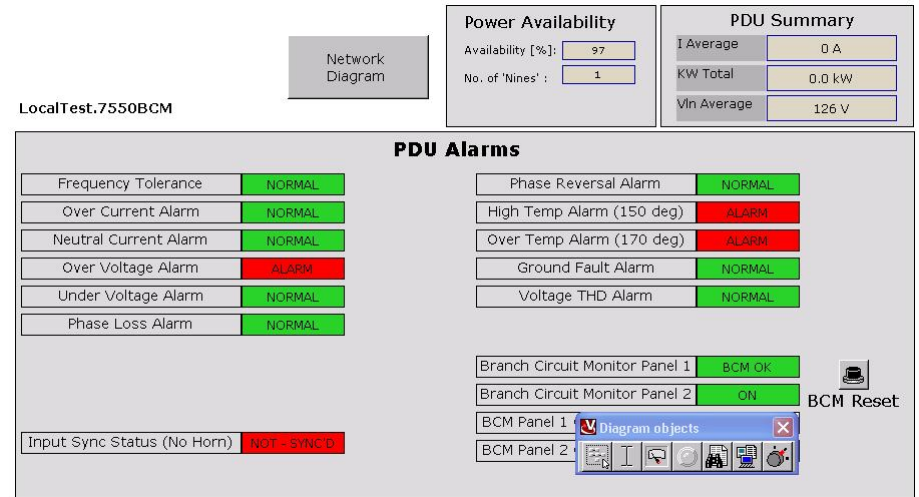
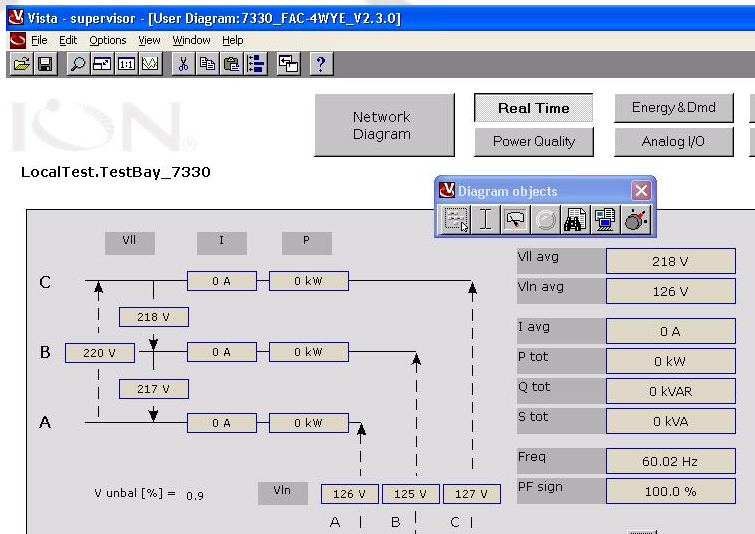
Modbus Device Importer - C:\Program Files\Power Measurement\ION Enterprise\config\templates\SixNet_DI8_AI8-T1_v0_0_1.ion

File Edit View Tools Settings Help

ION Map Information		Modbus Register Information									
		Label	Modbus Reg...	Request...	Format	Mask	Scale	Multiplier	Off...	Enu...	C
[-] SixNet_DI8_AI8-T1_v0_0_1											
[+] Analog I/O											
[+] Digital I/O											
		DI1	10001	R	UINT16	None	1	1	0	False	
		DI2	10002	R	UINT16	None	1	1	0	False	
		DI3	10003	R	UINT16	None	1	1	0	False	
		DI4	10004	R	UINT16	None	1	1	0	False	
		DI5	10005	R	UINT16	None	1	1	0	False	
		DI6	10006	R	UINT16	None	1	1	0	False	
		DI7	10007	R	UINT16	None	1	1	0	False	
		DI8	10008	R	UINT16	None	1	1	0	False	
		AI1	30001	R	UINT16	None	655	1	0	False	
		AI2	30002	R	UINT16	None	1	1	0	False	
		AI3	30003	R	UINT16	None	1	1	0	False	
		AI4	30004	R	UINT16	None	1	1	0	False	
		AI5	30005	R	UINT16	None	1	1	0	False	
		AI6	30006	R	UINT16	None	1	1	0	False	
		AI7	30007	R	UINT16	None	1	1	0	False	
		AI8	30008	R	UINT16	None	1	1	0	False	

* Vista Diagrams

- Meter Diagrams
 - Standard
 - Customizations



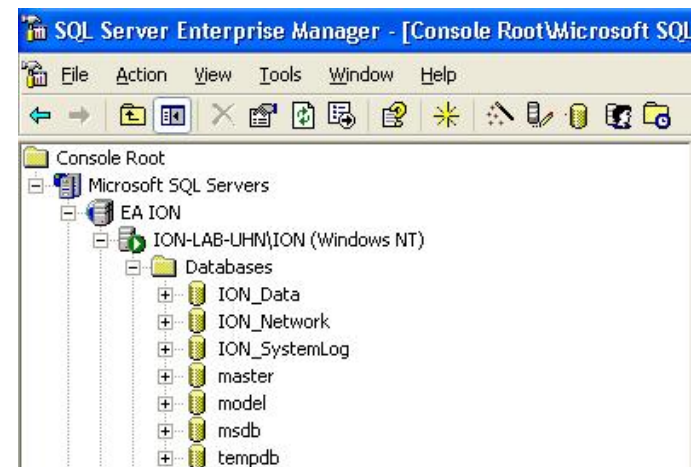
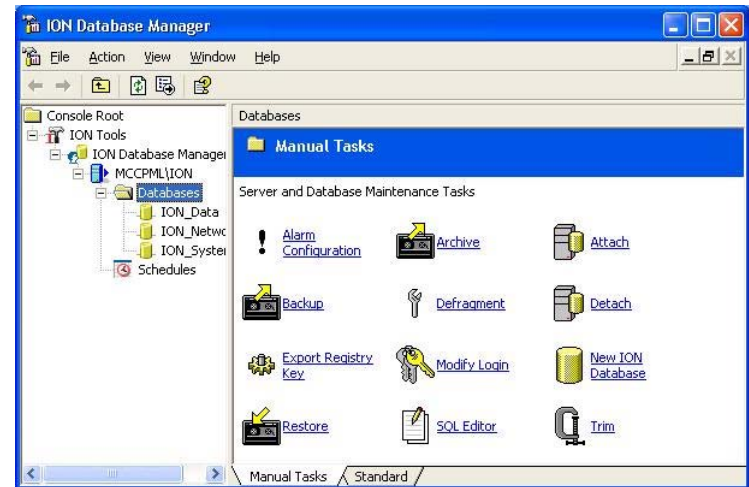
* *Working with Large Systems*

Communications

- *Ethernet Communications*
 - High Bandwidth
 - Star Topology
 - Requires Hub/Switch
 - Software Tools for Diagnostics
- *Serial Communications*
 - Low Bandwidth
 - Daisy-Chain Topology
 - Hardware/Software Tools for Diagnostics
- *Considerations*
 - Bandwidth Limitations
 - Reliability
 - Logged Data Retrieval vs. Vista Real-Time Update
 - Alarm Conditions

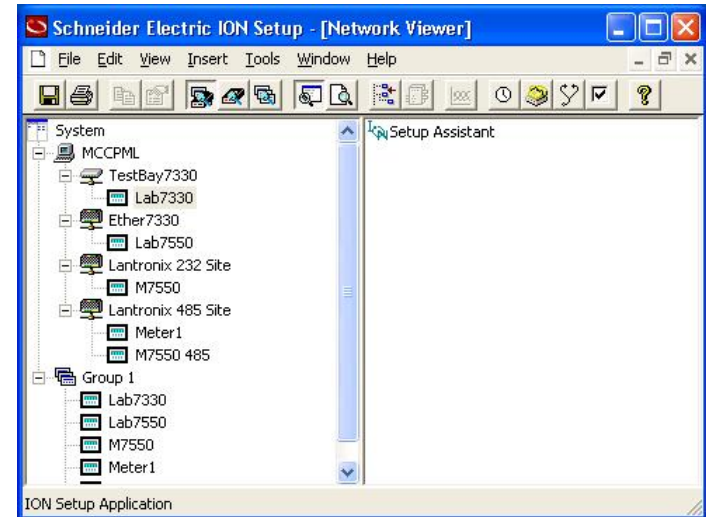
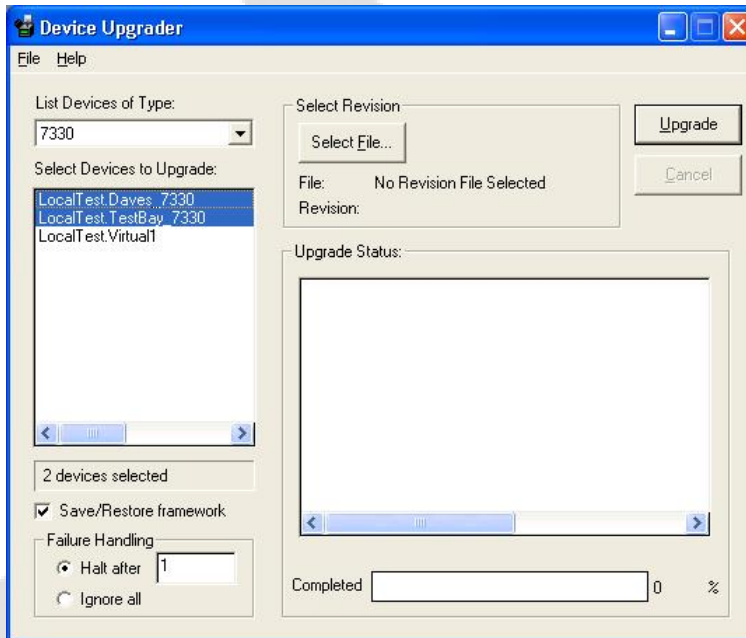
* Database Growth

- *Meter Configuration*
 - Recorders
 - Waveform Recorders
 - Alarms/Events
- *Trimming (ION Database Manager)*
 - Choose among Data, Waveforms or Events
 - Date range based All-Or-Nothing
 - Discard or Archive Trimmed data
- *Archiving (ION Database Manager)*
 - Removes data from 'live' database
 - Improves query (search) response
- *Direct Access (SQL Server Enterprise Manager)*
 - Gives you access the the data structure directly
 - No faster way to mess everything up



* *Mass Updates*

- *Framework Update (ION Setup)*
 - Use Meter Network mode
- *Firmware Update (Device Upgrader)*
 - Only update firmware if necessary
 - Update can break custom Framework
 - Framework must be restored



* *Result . . .*

- State of the art technology
- Power system components fully integrated
- Data available when you need it

* *Thank You*

- Contact us for systems designed and engineered to meet your requirements, with unmatched support by The E.A. Group.