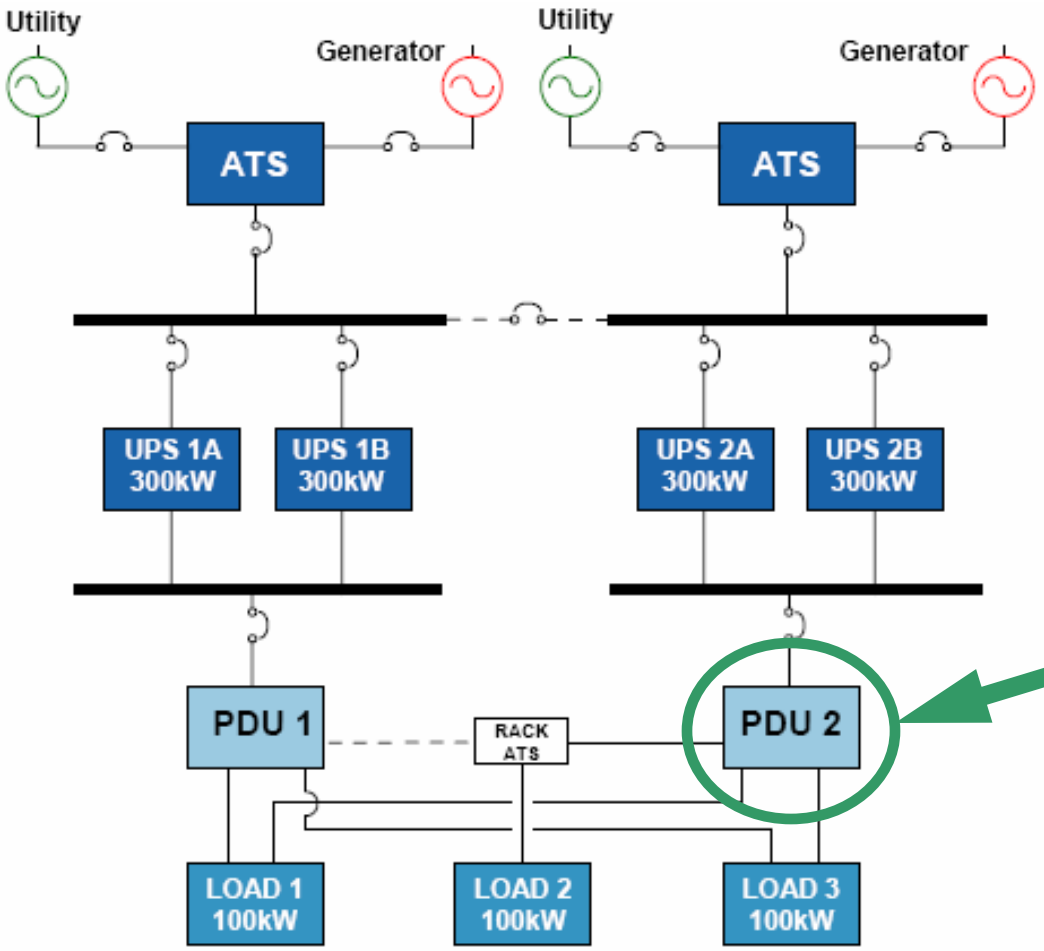
Branch Circuit Monitoring in Data Centers

Steve Popple
October 23, 2009

Schneider Electric

Where does branch Circuit monitoring occur?
Within the Datacenter's PDU or RPP

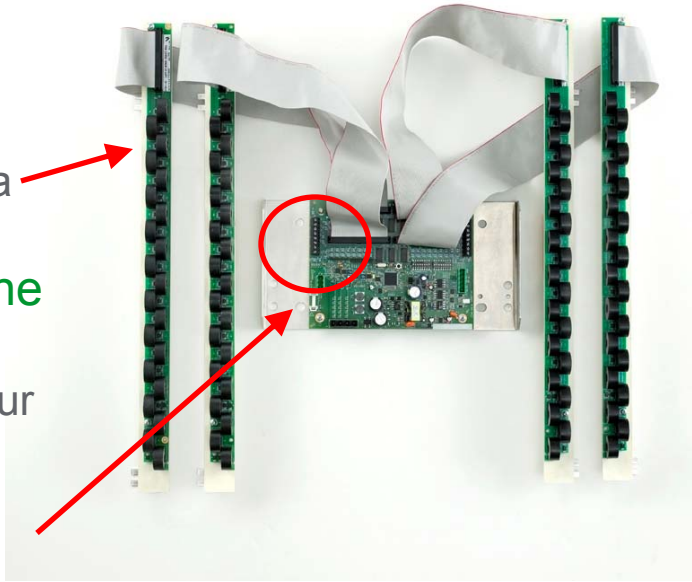


Data center schematic, showing overview of power distribution components.

Powerlogic Branch Circuit Power Meter (BCPM)

The BCPM monitors a complete power distribution unit (PDU)

- CT strips monitor the circuits
  - Monitor 84 circuits with a single BCPM
- Auxiliary inputs monitor the mains
  - Two sets of inputs for four auxiliary CTs (3-phase plus neutral) per BCPM
  - Auxiliary 1/3 V CTs ordered seperately through your local sales representative



BCPM Applications

Designed for data centers and critical power operations

The BCPM provides data center managers with information that allows them to:

1. Maximize uptime and avoid outages
    - Full alarming on every circuit warns of an issue before a breaker trip occurs
2. Efficiently use existing infrastructure
    - View circuit loading and redistribute to maximize efficiency
3. Effectively plan future infrastructure needs
    - Use historical reports to accurately predict future needs
4. Simply and easily allocate costs
    - Track usage patterns to determine areas of potential savings

BCPM Features and Benefits

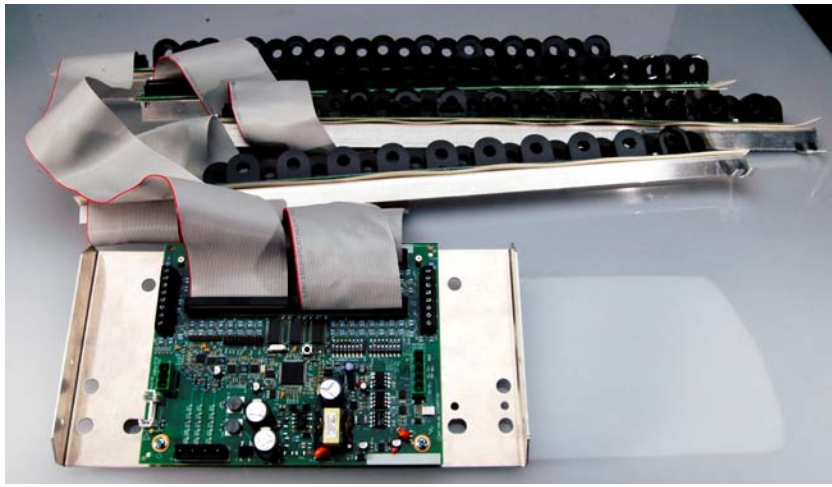
The new BCPM offers:

- Low cost per meter point
  - Monitor 84 circuits with a single BCPM
- Flexible installation options
  - ¾” and 1” CT spacing available
  - Multiple strip configurations supported: Inline, Top feed, bottom feed
- Cost effective communications – Modbus over RS485
  - Easily integrates into existing network
- High accuracy and dynamic range
  - Accurate at low current values, down to ¼ A
- Three feature sets, to meet your specific needs
  - Basic – Current only in the circuits and mains
  - Intermediate – Current in the circuits, power and energy in the mains
  - Advanced – Power and energy in the circuits and mains

BCPM Features and Benefits

Advanced alarming capabilities

- Multiple alarm levels, to protect your system
  - Low-low, low, high, high-high
  - Multiple alarm levels provide a warning of potential issues and allow operators to respond proactively
  - User defined alarm set-points
- Alarms are both instantaneous and latching
- Alarm counters ensure valuable historical data is maintained and potential problem areas are tracked



BCPM – Feature Set Details

The BCPM is available in 3 feature sets:

Advanced (Option A) features power and energy calculations on every circuit

Intermediate (Option B) includes power and energy on the mains, and current only on the branch circuits

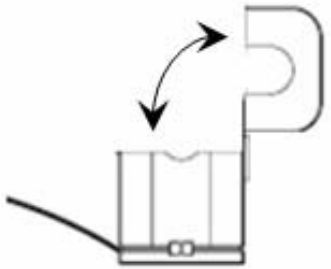
Basic (Option C) measures power only on every circuit

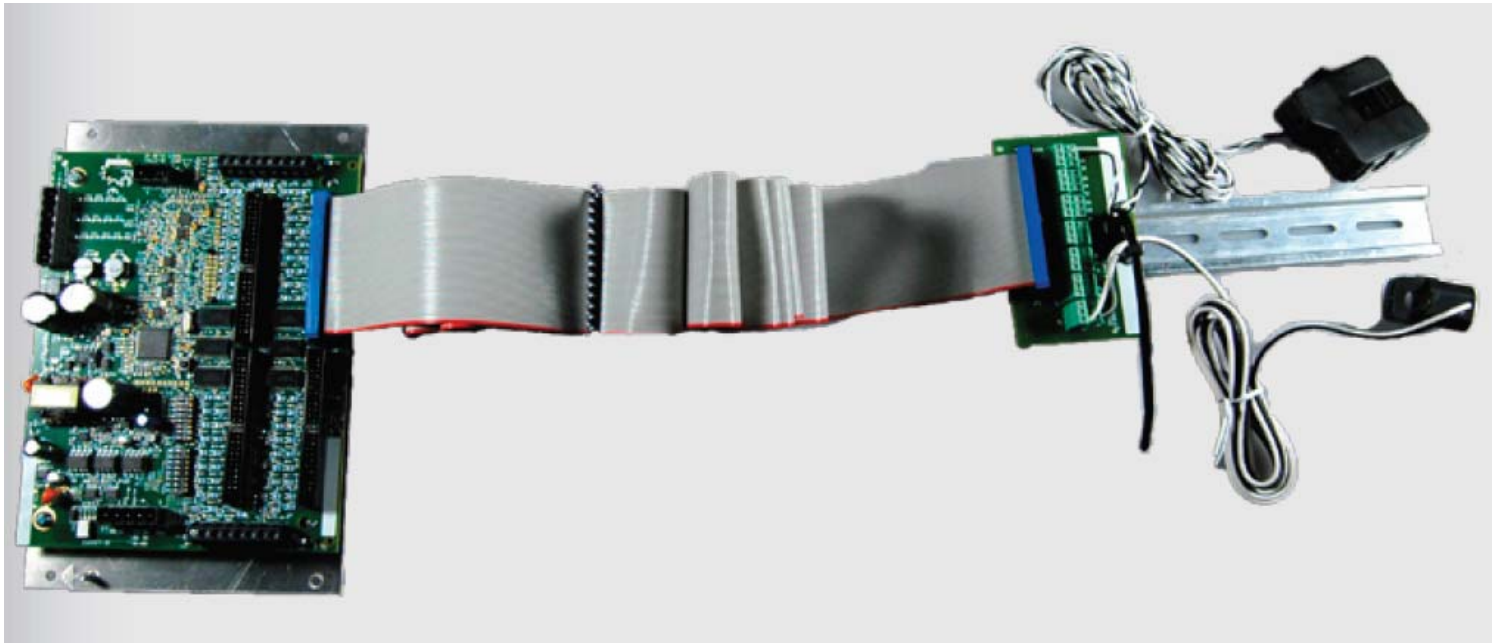
	BCPM		
	Advanced	**Intermediate**	**Basic**
Circuit metering (measurements per circuit)			
Current	■	■	■
Present and max current demand	■	■	■
Max current	■	■	■
Power	■		
Present and max demand	■		
Energy	■		
Power factor	■		
Mains metering (measurements per mains)			
Current, per phase	■	■	■
Max current, per phase	■	■	■
Present and max current demand, per phase	■	■	■
Power per phase	■	■	
Energy per phase	■	■	
Power Factor, total and per phase	■	■	
Voltage, line to line and average L-L	■	■	
Voltage, line to neutral and average L-N	■	■	
Frequency (Phase A)	■	■	

BCPM – Split Core
In Development

Designed for retrofit applications

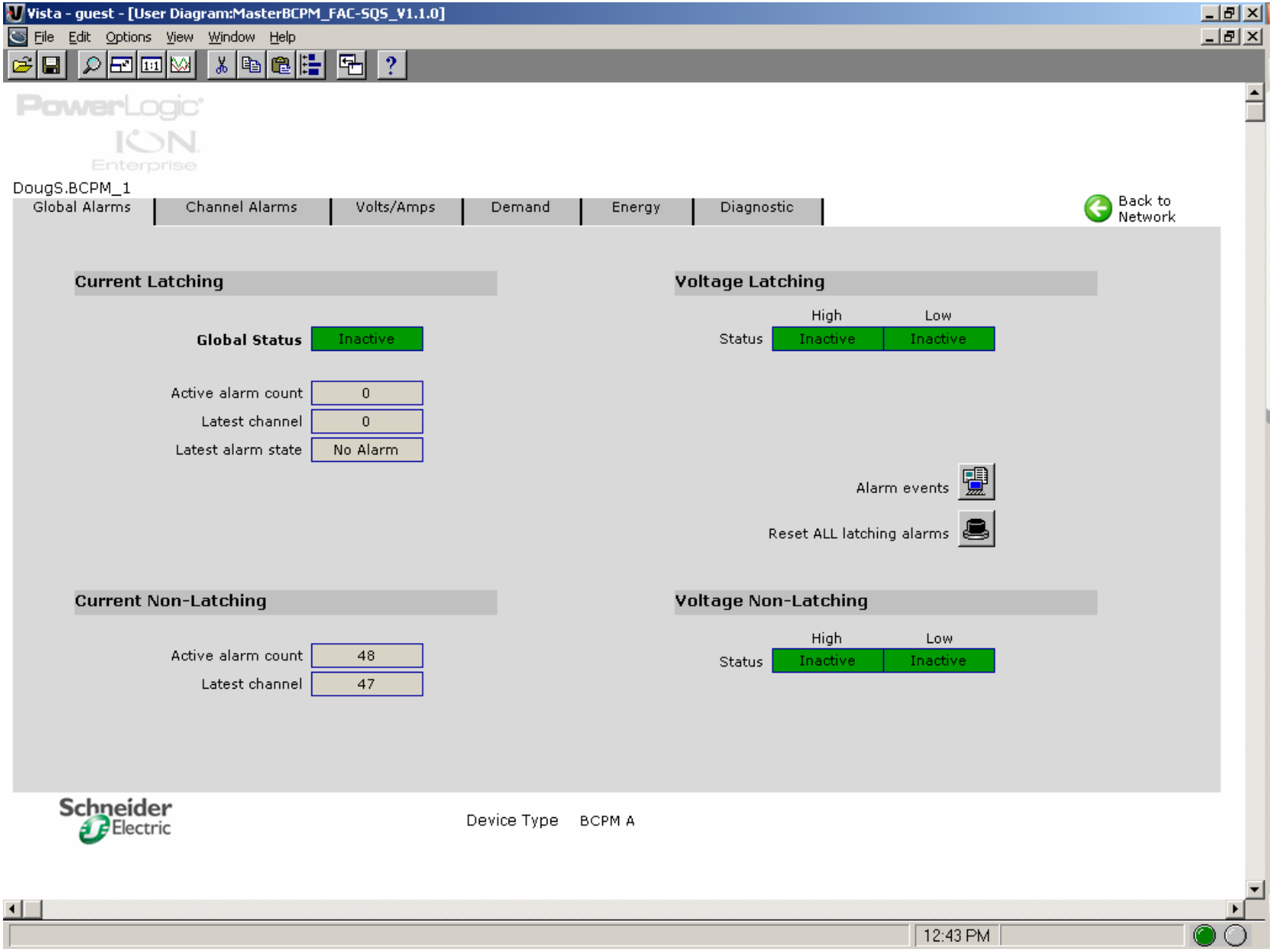
- 50 A and 100 A split core CTs

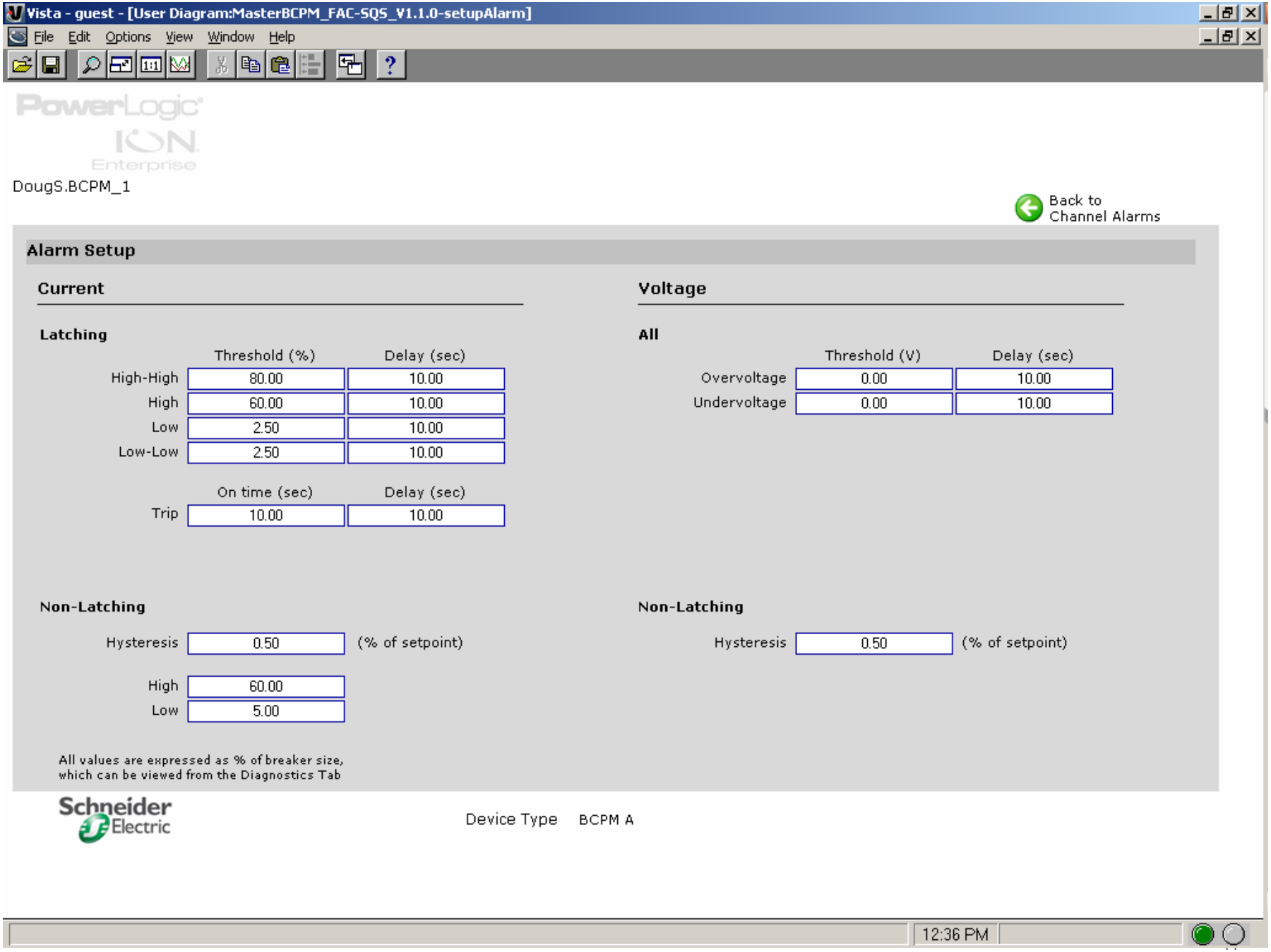


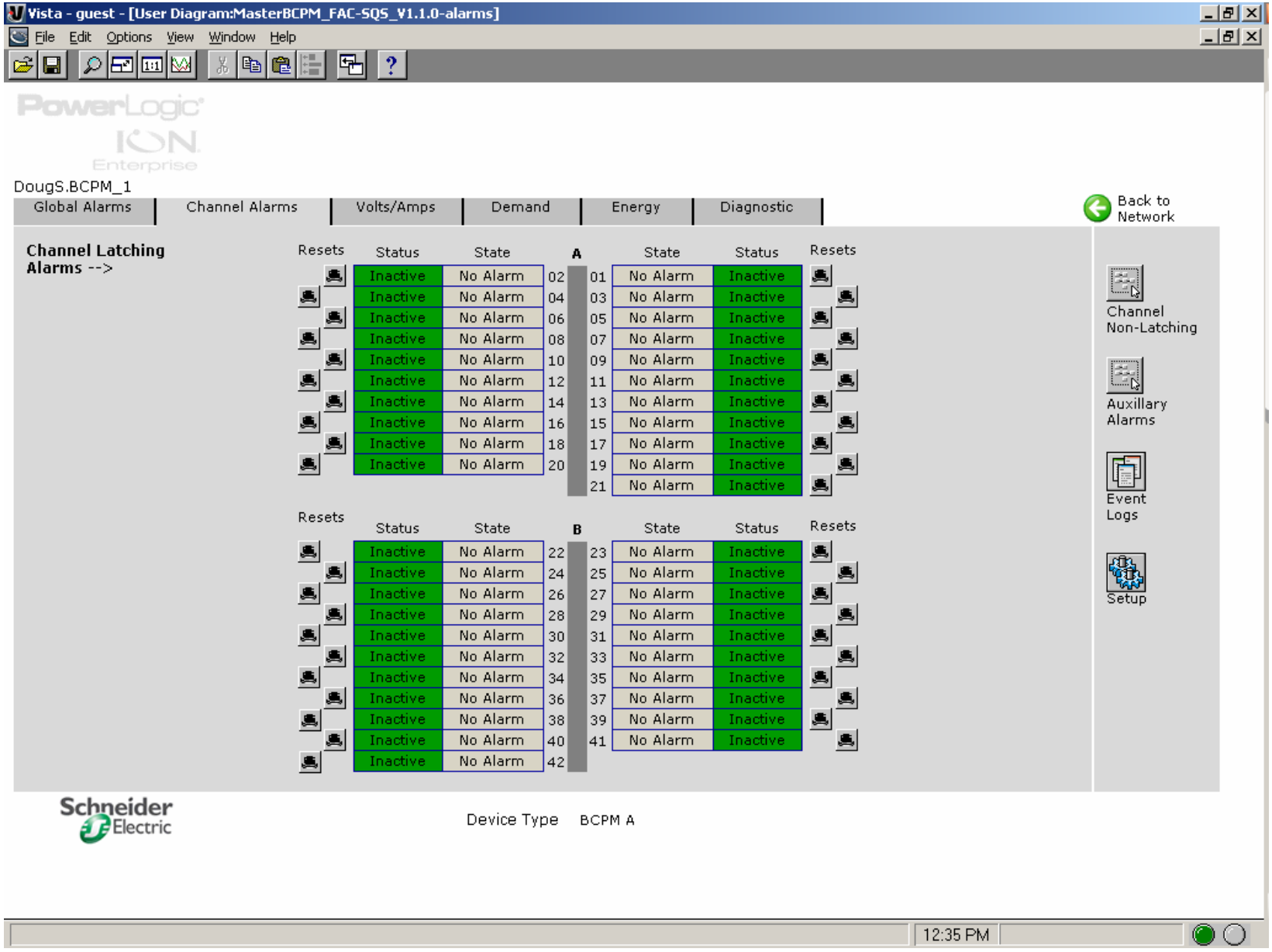


BCPM – Software Support

- Supported in ION Enterprise
  - Monitor all branch circuits and incoming mains for alarms
  - Adjust alarm set points a
  - View real time values – current, power, power factor
  - Log demand and energy values


Vista - guest - [User Diagram:MasterBCPM_FAC-SQS_V1.1.0]
File Edit Options View Window Help
PowerLogic ION Enterprise
DougS.BCPM_1
Global Alarms
Channel Alarms
Volts/Amps
Demand
Energy
Diagnostic
Back to Network
Current Latching
Global Status
Inactive
Active alarm count
0
Latest channel
0
Latest alarm state
No Alarm
Voltage Latching
High
Low
Status
Inactive
Inactive
Alarm events
Reset ALL latching alarms
Current Non-Latching
Active alarm count
48
Latest channel
47
Voltage Non-Latching
High
Low
Status
Inactive
Inactive
Schneider Electric
Device Type BCPM A
12:43 PM


Vista - guest - [User Diagram:MasterBCPM_FAC-SQS_V1.1.0-setupAlarm]
File Edit Options View Window Help
PowerLogic ION Enterprise
DougS.BCPM_1
Back to Channel Alarms
Alarm Setup
Current
Latching
Threshold (%) Delay (sec)
High-High 80.00 10.00
High 60.00 10.00
Low 2.50 10.00
Low-Low 2.50 10.00
On time (sec) Delay (sec)
Trip 10.00 10.00
Non-Latching
Hysteresis 0.50 (% of setpoint)
High 60.00
Low 5.00
All values are expressed as % of breaker size, which can be viewed from the Diagnostics Tab
Voltage
All
Threshold (V) Delay (sec)
Overvoltage 0.00 10.00
Undervoltage 0.00 10.00
Non-Latching
Hysteresis 0.50 (% of setpoint)
Schneider Electric
Device Type BCPM A
12:36 PM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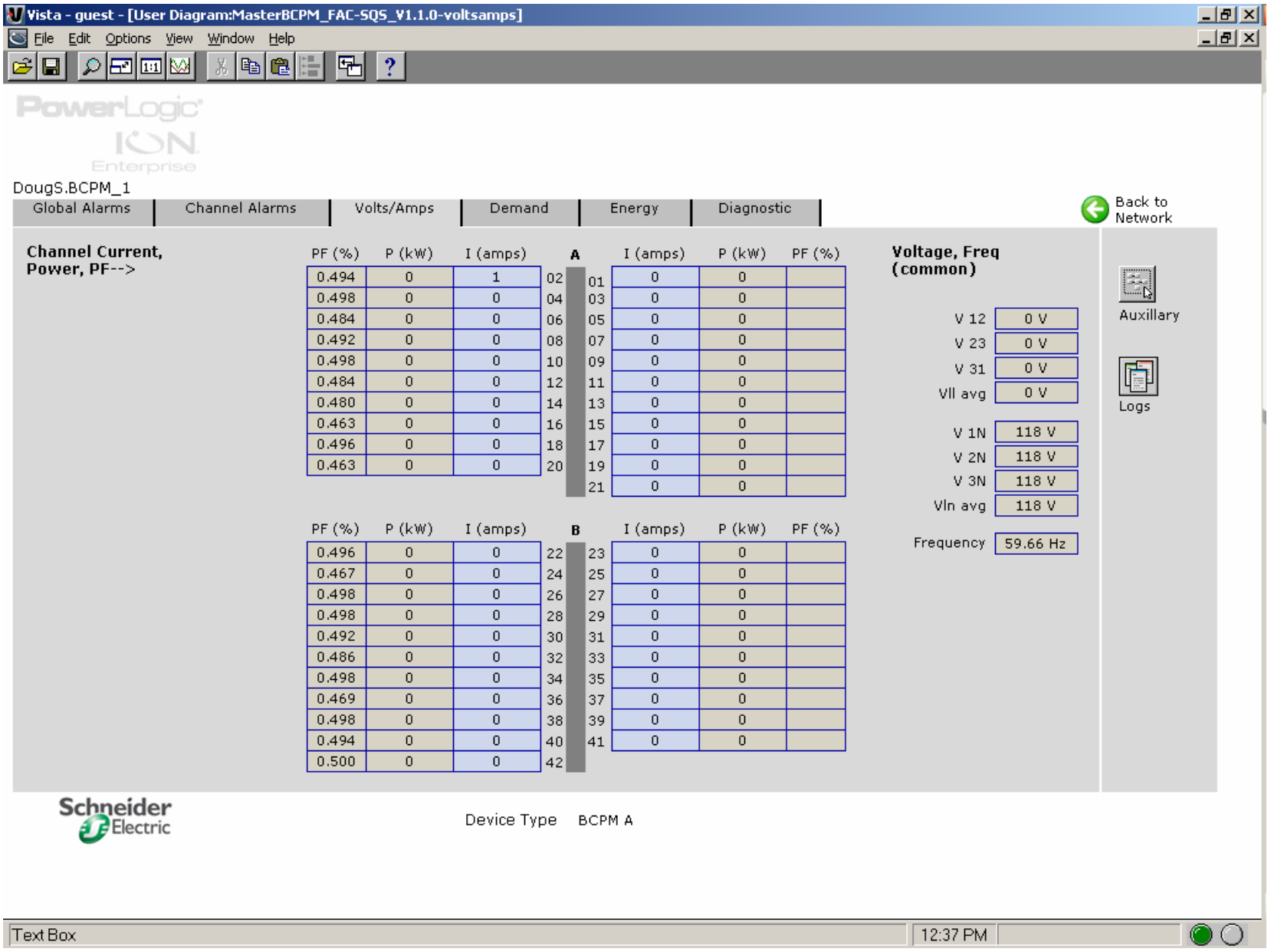
File Edit Options View Window Help
PowerLogic ION Enterprise
DougS.BCPM_1
Global Alarms
Channel Alarms
Volts/Amps
Demand
Energy
Diagnostic
Back to Network
Channel Latching Alarms -->
Resets Status State A State Status Resets
Inactive No Alarm 02 01 No Alarm Inactive
Inactive No Alarm 04 03 No Alarm Inactive
Inactive No Alarm 06 05 No Alarm Inactive
Inactive No Alarm 08 07 No Alarm Inactive
Inactive No Alarm 10 09 No Alarm Inactive
Inactive No Alarm 12 11 No Alarm Inactive
Inactive No Alarm 14 13 No Alarm Inactive
Inactive No Alarm 16 15 No Alarm Inactive
Inactive No Alarm 18 17 No Alarm Inactive
Inactive No Alarm 20 19 No Alarm Inactive
21 No Alarm Inactive
Resets Status State B State Status Resets
Inactive No Alarm 22 23 No Alarm Inactive
Inactive No Alarm 24 25 No Alarm Inactive
Inactive No Alarm 26 27 No Alarm Inactive
Inactive No Alarm 28 29 No Alarm Inactive
Inactive No Alarm 30 31 No Alarm Inactive
Inactive No Alarm 32 33 No Alarm Inactive
Inactive No Alarm 34 35 No Alarm Inactive
Inactive No Alarm 36 37 No Alarm Inactive
Inactive No Alarm 38 39 No Alarm Inactive
Inactive No Alarm 40 41 No Alarm Inactive
42
Channel Non-Latching
Auxillary Alarms
Event Logs
Setup
Schneider Electric
Device Type BCPM A
12:35 PM


Vista - guest - [User Diagram:MasterBCPM_FAC-SQS_V1.1.0-voltsamps]
File Edit Options View Window Help
PowerLogic ION Enterprise
DougS.BCPM_1
Global Alarms
Channel Alarms
Volts/Amps
Demand
Energy
Diagnostic
Back to Network
Channel Current, Power, PF-->
PF (%) P (kW) I (amps) A I (amps) P (kW) PF (%)
0.494 0 1 02 01 0 0
0.498 0 0 04 03 0 0
0.484 0 0 06 05 0 0
0.492 0 0 08 07 0 0
0.498 0 0 10 09 0 0
0.484 0 0 12 11 0 0
0.480 0 0 14 13 0 0
0.463 0 0 16 15 0 0
0.496 0 0 18 17 0 0
0.463 0 0 20 19 0 0
21 0 0
PF (%) P (kW) I (amps) B I (amps) P (kW) PF (%)
0.496 0 0 22 23 0 0
0.467 0 0 24 25 0 0
0.498 0 0 26 27 0 0
0.498 0 0 28 29 0 0
0.492 0 0 30 31 0 0
0.486 0 0 32 33 0 0
0.498 0 0 34 35 0 0
0.469 0 0 36 37 0 0
0.498 0 0 38 39 0 0
0.494 0 0 40 41 0 0
0.500 0 0 42
Voltage, Freq (common)
V 12 0 V
V 23 0 V
V 31 0 V
Vll avg 0 V
V 1N 118 V
V 2N 118 V
V 3N 118 V
Vln avg 118 V
Frequency 59.66 Hz
Auxillary
Logs
Schneider Electric
Device Type BCPM A
Text Box
12:37 PM