

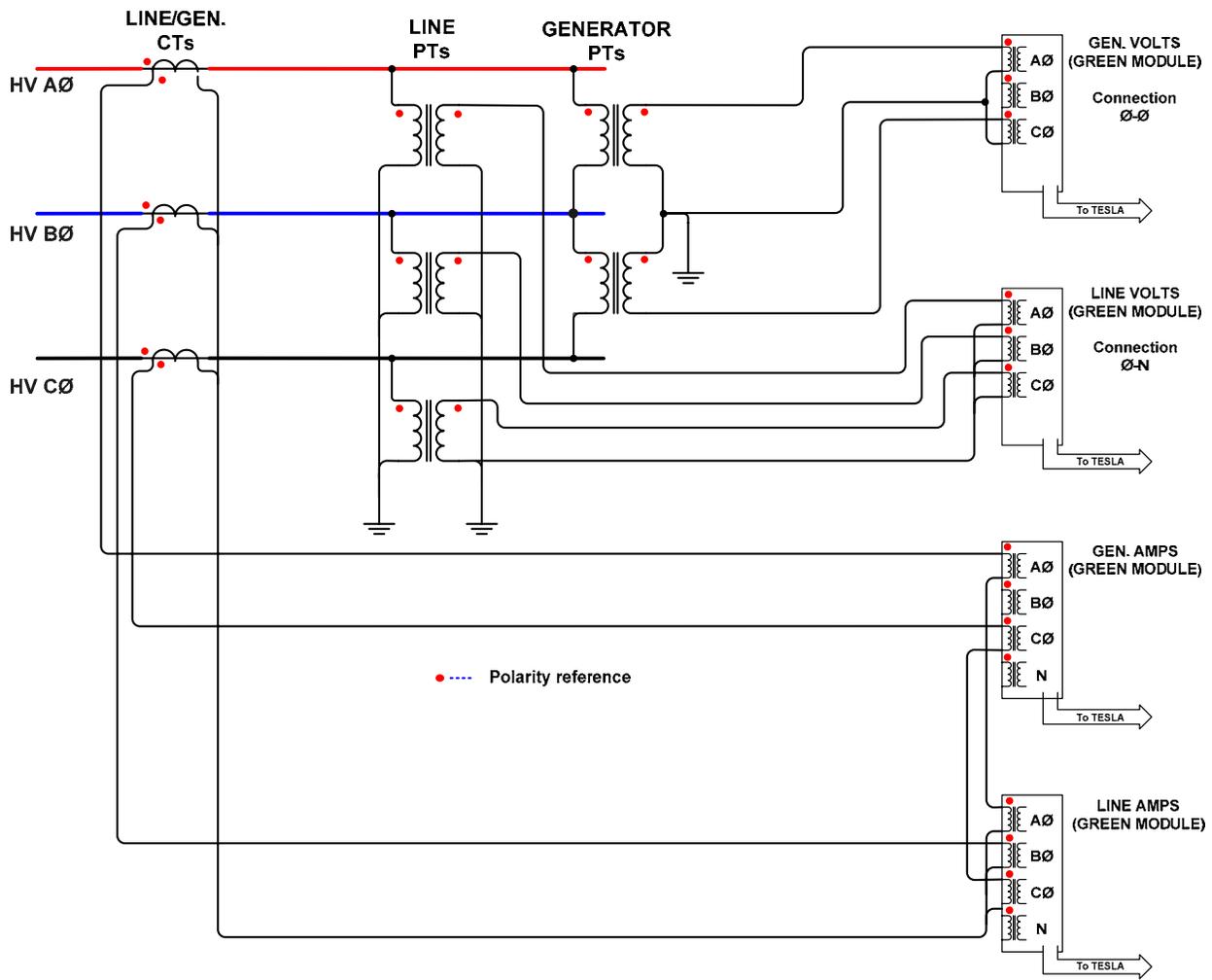
TESLA Recorder Power Metering Setup

Configuration for 3 and 2 Element Watt/VAR Metering

Introduction

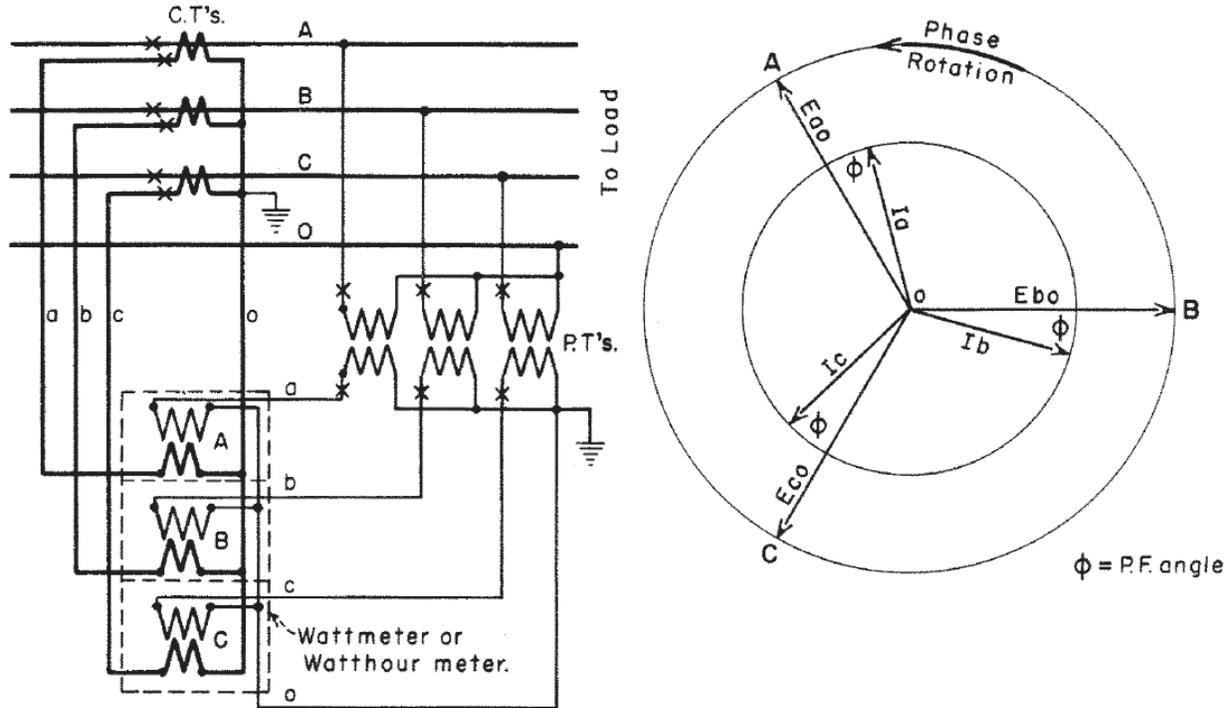
This application note will assist the user to set up 3-phase metering to monitor Watt, VAR and VA power quantities for a power system element, such as a transmission line or generator. The note will also describe the use of 3 and 2 element power metering in a TESLA recording system.

Wiring schematic for connection to TESLA metering recording system:



Configuration of 3-Element Line Metering

3-Element Metering:



The 3-element type meter is designed to operate from a current transformer in each of the 3 phases and a potential transformer connected between each phase and the neutral or ground, as shown above. It is applicable to 3-phase, 4-wire or grounded neutral circuits. Its accuracy is independent of all conditions of unbalanced currents and voltages and varying power factor. It is essentially 3 single-phase elements mounted on 1 shaft so that their torques can be totalized as in Electrical-Mechanical KWHR meters. Each element operates at the same power factor as the metered load for all conditions. Special transformers may be required when used with delta-connected loads.

3-Element Meter: Basic Formulas

The energy measured by each element is as follows:

$$P_a = E_{an} * I_a * \cos\phi$$

$$P_b = E_{bn} * I_b * \cos\phi$$

$$P_c = E_{cn} * I_c * \cos\phi$$

$$\text{And } P = P_a + P_b + P_c = (E_{an} * I_a * \cos\phi) + (E_{bn} * I_b * \cos\phi) + (E_{cn} * I_c * \cos\phi)$$

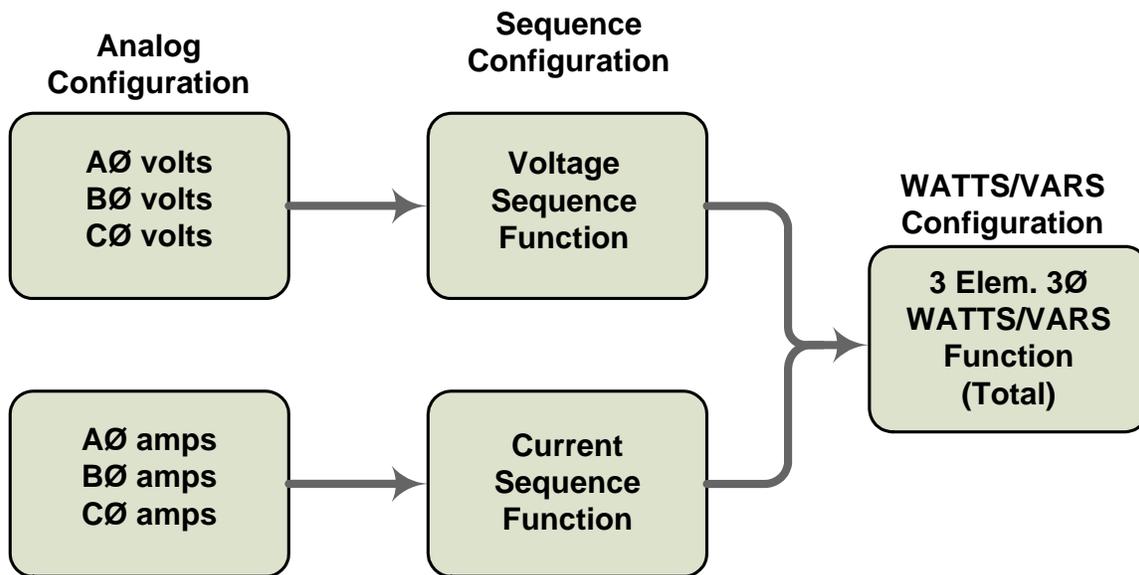
This is applicable to all conditions of unbalance. Assume the usual condition where the voltages and currents are balanced:

$$E_{an} = E_{bn} = E_{cn} = E$$

$$\text{And } I_a = I_b = I_c = I, \text{ therefore } P = 3 * E * I * \cos\theta$$

TESLA Configuration Metering Logic

The diagram below shows how the 3-element metering logic is set up in the TESLA configuration setting to meter 3-phase power in a transmission line. Three-phase metering uses 3 phase-to-neutral voltages and 3 phase currents.



The diagram above illustrates configuration logic for the 3-element metering to achieve the final 3-phase TOTAL Watts/VARS/VA metering logic. This type of metering is best used where the load would be UNBALANCED, such as radial feeder lines, where 3-phase unbalanced voltage and current quantities would be an issue for revenue metering accuracy.

Configuration of 3-Element Watt/VAR/VA Metering TESLA Recording System

The following screenshots will illustrate how to set up a 3-phase Watt/VAR/VA metering element in the TESLA recording system, using the **3-element Wattmeter method**.

Required:

- 1 three-channel “green” voltage module – model 401006
- 1 three-channel “green” current module – model 401014
- 3 high voltage measuring Potential instrument transformers (PTs), **phase to ground**
- 3 high voltage measuring Current instrument transformers (CTs) for phase currents

Step 1: configure analog phase to neutral (ground) voltages.

In this configuration sample, the PT and CT ratios will be 1:1 and the user can use the appropriate ratio to suit their installation setup.

Note: View the metering screen by selecting from the drop-down menu at the bottom of the metering screen: **Primary to Secondary** values.

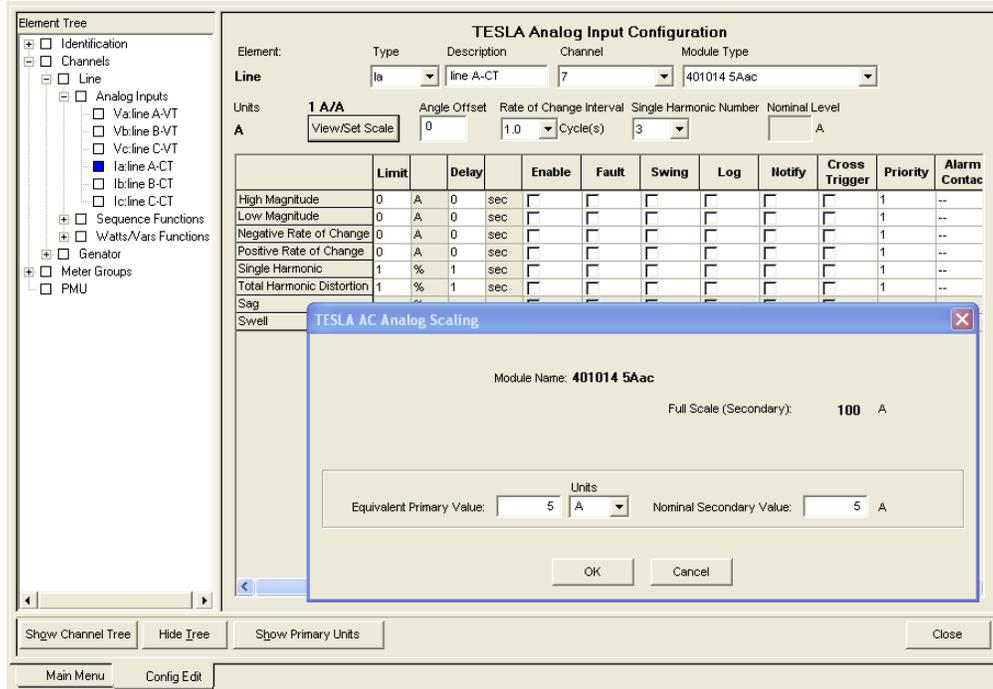
The screenshot displays the 'TESLA Analog Input Configuration' window. On the left is an 'Element Tree' with 'Line' selected. The main area shows configuration for 'Line' with 'Va' channel and '401006 69Vac Isolated Neutral' module. Below this is a table of triggers with columns: Limit, Delay, Enable, Fault, Swing, Log, Notify, Cross Trigger, Priority, Alarm Contact.

	Limit	Delay	Enable	Fault	Swing	Log	Notify	Cross Trigger	Priority	Alarm Contact
High Magnitude	0 V	0 sec	<input type="checkbox"/>	1	--					
Low Magnitude	0 V	0 sec	<input type="checkbox"/>	1	--					
Negative Rate of Change	0 V	0 sec	<input type="checkbox"/>	1	--					
Positive Rate of Change	0 V	0 sec	<input type="checkbox"/>	1	--					
Single Harmonic	1 %	1 sec	<input type="checkbox"/>	1	--					
Total Harmonic Distortion	1 %	1 sec	<input type="checkbox"/>	1	--					
Sag	50 %		<input type="checkbox"/>	1	--					
Swell	110 %		<input type="checkbox"/>	1	--					

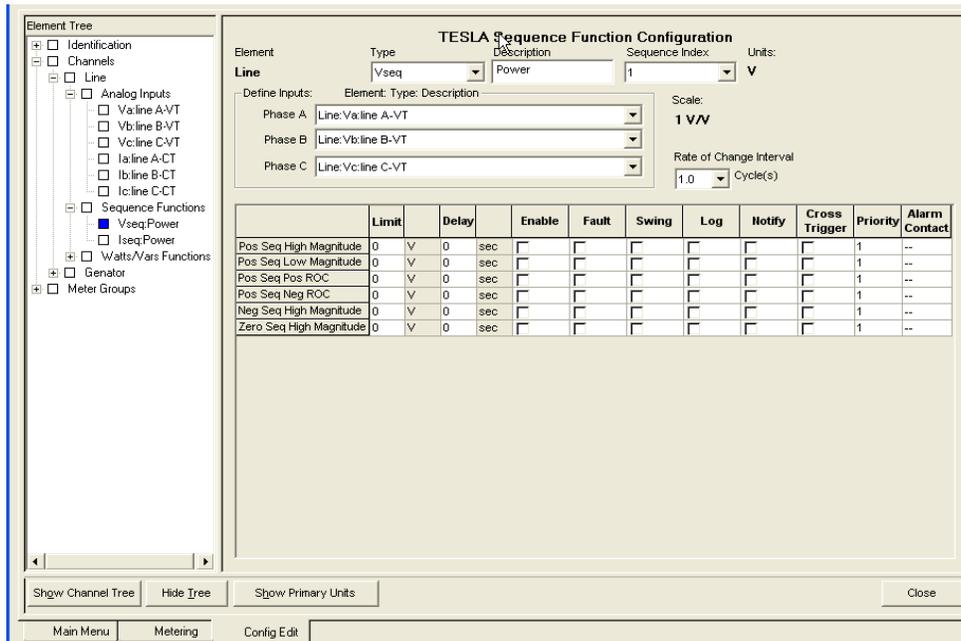
The 'TESLA AC Analog Scaling' dialog box shows: Module Name: 401006 69Vac Isolated Neutral, Full Scale (Secondary): 138 V, Equivalent Primary Value: 69 V, Units: V, Nominal Secondary Value: 69 V.

In the TESLA Control Panel, you will enter the information about the AØ analog voltage input, selecting channel, Module Type and ratio of the phase-to-neutral voltage (Ø-N) transformer used to supply the analog channel. At this time the user could set up the channel’s triggers to start the recording. This application note only describes setting up the metering for the recorder. When you finish doing AØ, then continue completing BØ and CØ metering setup.

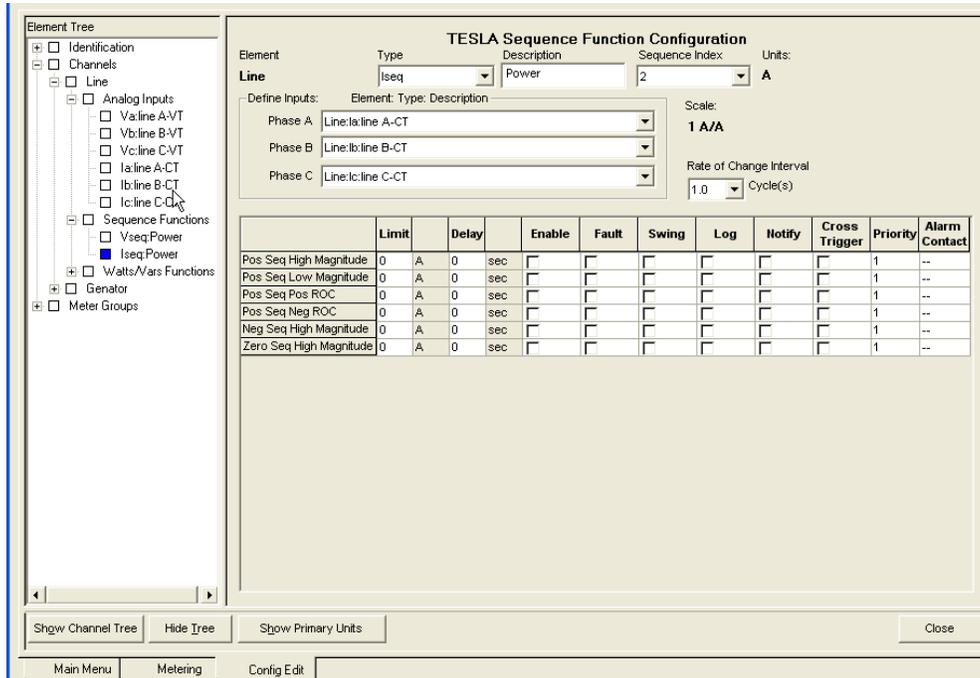
Step 2: configure the current channels the same way as the voltage.



Step 3: get ready to set up the Watt/VAR function configuration; a voltage sequence and current sequence is required to input into the Watt/VAR function to produce 3-phase Watt/VAR configuration. The user will first make up a voltage sequence function, as shown in the figure below.



Step 4: create a Current Sequence Function using the 3-phase currents.



Step 5: create a Watt/VAR using the positive voltage and current sequence function. The user could, at this time, configure the recorder for Watt/VAR triggers. There are 2 Watt triggers and 1 VAR trigger that are mainly used for swing recording for power system analysis or trend recording. Trend and swing values will show up as RMS values in the metering and recordings. There is 1 sample per power cycle (50 or 60 Hz) of RMS values.

Note:

To create 3-phase Watts/VARs with 3-phase voltages and 3-phase currents, a Voltage Sequence Function and Current Sequence Function must be created.

Setup screen for 3Ø Watts/VARS:

Element Tree

- Identification
- Channels
 - Line
 - Analog Inputs
 - Va:line A-VT
 - Vb:line B-VT
 - Vc:line C-VT
 - Ia:line A-CT
 - Ib:line B-CT
 - Ic:line C-CT
 - Sequence Functions
 - Vseq:Power
 - Iseq:Power
 - Watts/Vars Functions
 - W/V:Power
- Genator
- Meter Groups

TESLA Watts/Vars Function Configuration

Element: **Line** Description: **Power** Watts/Vars Index: **1** Scale: **1e-006 MVA/VA**

Voltage Input: **Line:Vseq:Power** Rate of Change Intervals (Cycles):
 Watts 1: **1.0** Watts 2: **1.0** Vars: **1.0**

Current Input: **Line:Iseq:Power**

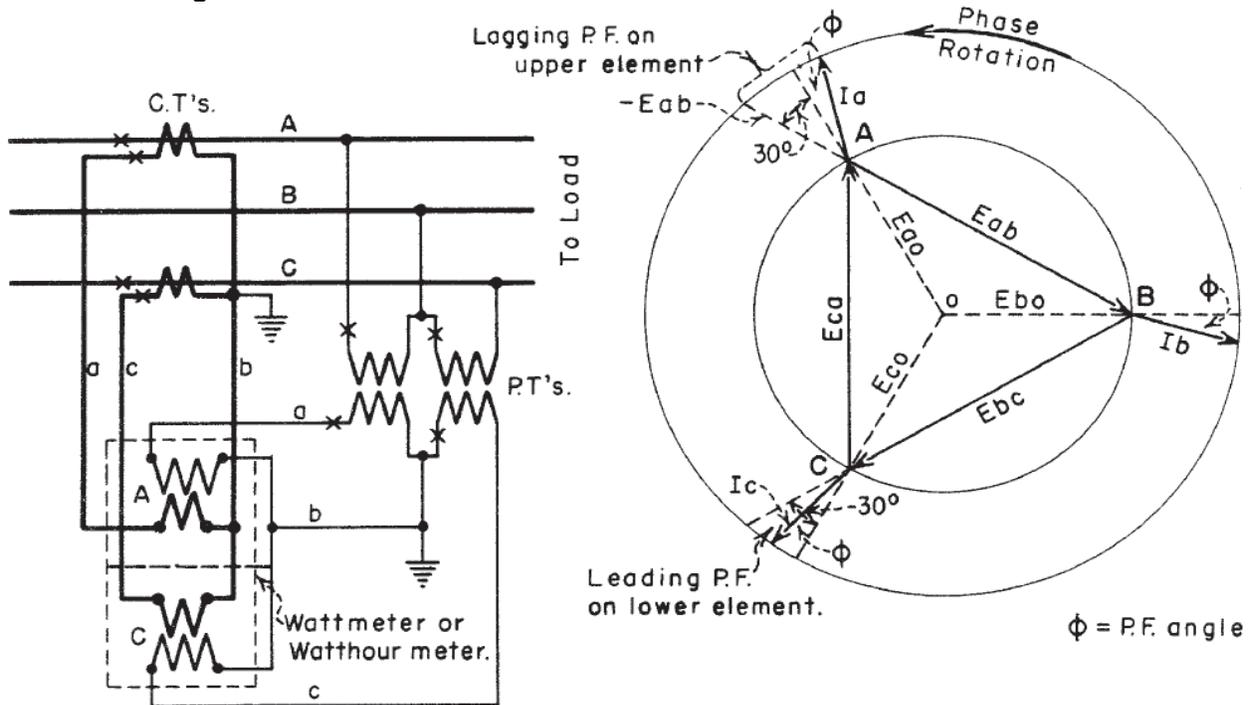
	Limit	Delay	Enable	Fault	Swing	Log	Notify	Cross Trigger	Priority	Ali Coi
Watts High Level Detector 1	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Watts Low Level Detector 1	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Watts Positive ROC Detector 1	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Watts Negative ROC Detector 1	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Watts High Level Detector 2	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Watts Low Level Detector 2	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Watts Positive ROC Detector 2	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Watts Negative ROC Detector 2	0	W	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Vars High Level	0	VAR	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Vars Low Level	0	VAR	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Vars Positive ROC	0	VAR	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--
Vars Negative ROC	0	VAR	0	sec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1	--

Show Channel Tree
Hide Tree
Show Primary Units
Close

Main Menu
Metering
Config Edit

Configuration of 2-Element Generation Metering

2-Element Metering:



The 2-element-type meter is designed to operate from current in 2 of the 3 phases and the potential between the 2 phases, as shown above. It is the most universally used 3-phase meter connection, and it is recommended for ungrounded delta-connected circuits only, although applicable to all 3-phase, 3-wire ungrounded circuits and to 4-wire or grounded circuits if no load is connected between a phase wire and the neutral or ground. The connection is the same as used on the 2-wattmeter method of power measurement, and is theoretically as accurate as the 3-wattmeter or 3-element method when used on 3-phase, 3-wire systems. However, the power factor and resulting torque on the 2 elements is always different, and therefore the 2 elements must be accurately compensated for power-factor errors over the full range of leading and lagging power factors over which the meter will be operated. For example, at a load power factor of 96% lagging (15°), the power factor on 1 element of the meter will be 96% (15°) lead while the other is 70% (45°) lag, as shown above. At a load power factor of 50% lagging, the torque on 1 element becomes 0, and below 50% power factor it reverses.

2-Element Meter: Basic Formulas

- the upper element measures:

$$P_1 = E_{ab} * I_a * \cos (30 + \emptyset) \text{ (} E_{ab} \text{ is reversed from its symmetrical order)}$$

- the lower element measures:

$$P_2 = E_{bc} * I_c * \cos (30 - \emptyset)$$

- and the total power measured is:

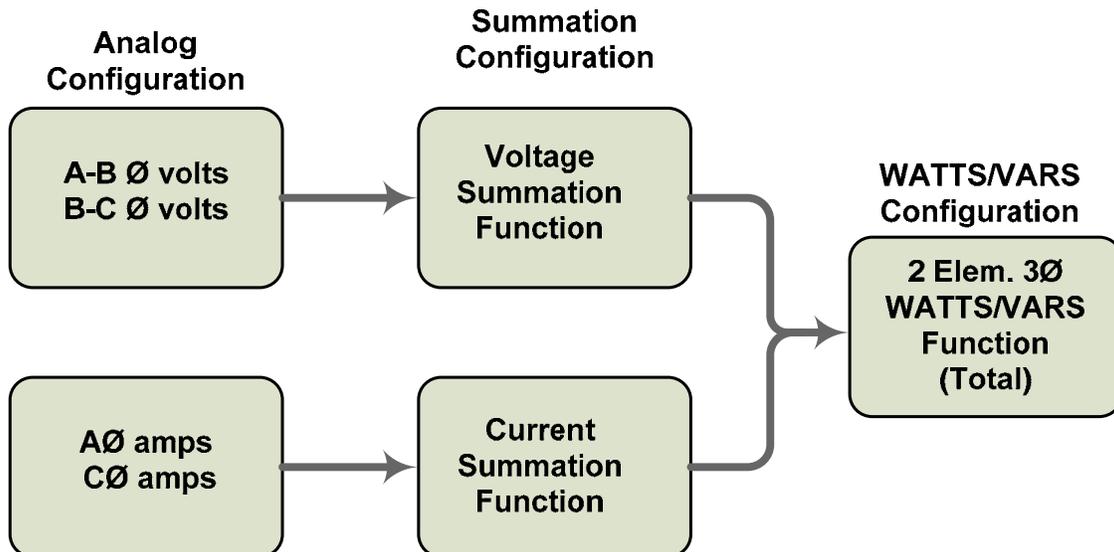
$$P = P_1 + P_2 = [E_{ab} * I_a * \cos (30 + \emptyset)] + [E_{bc} * I_c * \cos (30 - \emptyset)]$$

Important:

2-element metering is use for metering the Delta connection of a 3Ø Generator having 2 Ø-Ø PTs and 2 Ø CTs (AØ & CØ). It is use to measure the 3 phase, balanced power coming from the generator. If there is a power factor, angle and magnitude difference between the 2 metering elements, the accuracy will degrade. Some of the 2 element Kilowatt Hour meters there is some compensation for power factor. →Metering balanced 2 element 3Ø generators ←

TESLA Configuration Metering Logic

The diagram below shows how the 2-element metering logic is set up in the TESLA configuration setting to meter 3-phase power from a generator. Three phase metering use 2 phase to phase voltages and 2 phase currents.



The diagram above illustrates configuration logic for the 3-element metering to achieve the final 3-phase TOTAL Watts/VARS/VA metering logic. This type of metering is best used where the load would be BALANCED, such as 3-phase generators and large motors. 2-element energy meters are only accurate when used for revenue metering on 3-phase balanced loads.

Configuration of 2-Element Watt/VAR/VA Metering TESLA Recording System

The following “screen” shots will illustrate how to set up a 3-phase Watt/VAR/VA metering element in the TESLA recording system using **2-element Wattmeter method**.

Required:

- 1 three-channel “green” voltage module (**2 channels only**) – model 401006
- 1 three-channel “green” current module (**2 channels only**) – model 401014
- 2 high- voltage measuring Potential instrument transformers (PTs), **phase to phase**
- 2 high-voltage measuring Current instrument transformers (CTs) for phase currents

Step 1: configure analog phase to phase ($\sqrt{3}$) voltages.

In this configuration sample, the PT and CT ratios will be 1:1 and the user can use the appropriate ratio to suit their installation setup.

Note: View the metering screen by selecting from the drop down menu at the bottom of the metering screen: **Primary to Secondary** values.

The screenshot displays the 'TESLA Analog Input Configuration' window. On the left is an 'Element Tree' with a tree view showing 'Generator' > 'Analog Inputs' > 'Va:GEN A-B VT' selected. The main configuration area includes:

- Element:** Generator
- Type:** Va
- Description:** GEN A-B VT
- Channel:** 4
- Module Type:** 401003 69Vac Common Neutral
- Units:** 1 V/V
- Angle Offset:** 0
- Rate of Change Interval:** 1.0 Cycle(s)
- Single Harmonic Number:** 3
- Nominal Level:** 69 V

Below these fields is a table of triggers:

	Limit	Delay	Enable	Fault	Swing	Log	Notify	Cross Trigger	Priority	Alarm Contact
High Magnitude	0 V	0 sec	<input type="checkbox"/>	1	--					
Low Magnitude	0 V	0 sec	<input type="checkbox"/>	1	--					
Negative Rate of Change	0 V	0 sec	<input type="checkbox"/>	1	--					
Positive Rate of Change	0 V	0 sec	<input type="checkbox"/>	1	--					
Single Harmonic	1 %	1 sec	<input type="checkbox"/>	1	--					
Total Harmonic Distortion	1 %	1 sec	<input type="checkbox"/>	1	--					
Sag	50 %		<input type="checkbox"/>	1	--					
Swell	110 %		<input type="checkbox"/>	1	--					

The 'TESLA AC Analog Scaling' dialog box shows:

- Module Name: 401003 69Vac Common Neutral
- Full Scale (Secondary): 138 V
- Units: V
- Equivalent Primary Value: 120 V
- Nominal Secondary Value: 120 V

In the TESLA Control Panel, you will enter the information about the AØ analog voltage input, selecting channel, Module Type and ratio of the phase to neutral voltage (Ø-Ø) transformer used to supply the analog channel. At this time the user could set up the channel’s triggers to start the recording. The application note is just for setting up the metering for the recorder. When you finish doing AØ, the continue completing CØ metering setup.

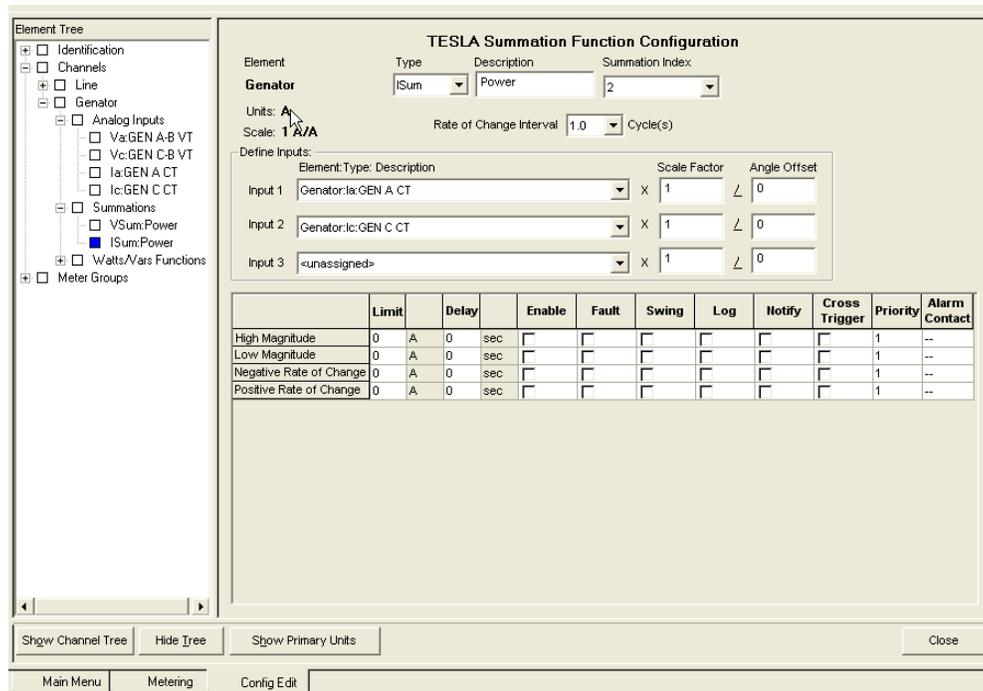
Step 2: configure the current channels the same way as the voltage.

	Limit	Delay	Enable	Fault	Swing	Log	Notify	Cross Trigger	Priority	Alarm Contact
High Magnitude	0	A	0 sec	<input type="checkbox"/>	1	--				
Low Magnitude	0	A	0 sec	<input type="checkbox"/>	1	--				
Negative Rate of Change	0	A	0 sec	<input type="checkbox"/>	1	--				
Positive Rate of Change	0	A	0 sec	<input type="checkbox"/>	1	--				
Single Harmonic	1	%	1 sec	<input type="checkbox"/>	1	--				
Total Harmonic Distortion	1	%	1 sec	<input type="checkbox"/>	1	--				

Step 3: get ready to set up the Watt/VAR function configuration; a voltage summation and current summation is required to input into the Watt/VAR function to produce 3-phase Watt/VAR configuration. The user will first make up a voltage sequence function as shown in the figure below.

	Limit	Delay	Enable	Fault	Swing	Log	Notify	Cross Trigger	Priority	Alarm Contact
High Magnitude	0	V	0 sec	<input type="checkbox"/>	1	--				
Low Magnitude	0	V	0 sec	<input type="checkbox"/>	1	--				
Negative Rate of Change	0	V	0 sec	<input type="checkbox"/>	1	--				
Positive Rate of Change	0	V	0 sec	<input type="checkbox"/>	1	--				

Step 4: create a Current Sequence Function using the 3-phase currents.



Step 5: create a Watt/VAR using the positive voltage and current sequence function. The user could, at this time configure the recorder for Watt/VAR triggers. There are 2 Watt triggers and 1 VAR trigger that are mainly used for swing recording for power system analysis or trend recording. Trend and swing values will show up as RMS values in the metering and recordings. There is 1 sample per power cycle (50 or 60 Hz) of RMS values.

Note:

To create 3-phase Watts/VARs with 2 phase-to-phase voltages and 2 phase currents, a Voltage Summation Function and Current Summation Function must be created.

Setup screen for 3Ø Watts/VARS:

TESLA Watts/Vars Function Configuration

Element: **Generator** | Description: **Power** | Watts/Vars Index: **2** | Scale: **1e-006 MVA/VA**

Voltage Input: **Generator:VSum:Power** | Current Input: **Generator:ISum:Power**

Rate of Change Intervals (Cycles):
 Watts 1: **1.0** | Watts 2: **1.0** | Vars: **1.0**

	Limit		Delay		Enable	Fault	Swing	Log	Notify	Cross Trigger	Priority	Ali Coi
Watts High Level Detector 1	0	W	0	sec	<input type="checkbox"/>	1	--					
Watts Low Level Detector 1	0	W	0	sec	<input type="checkbox"/>	1	--					
Watts Positive ROC Detector 1	0	W	0	sec	<input type="checkbox"/>	1	--					
Watts Negative ROC Detector 1	0	W	0	sec	<input type="checkbox"/>	1	--					
Watts High Level Detector 2	0	W	0	sec	<input type="checkbox"/>	1	--					
Watts Low Level Detector 2	0	W	0	sec	<input type="checkbox"/>	1	--					
Watts Positive ROC Detector 2	0	W	0	sec	<input type="checkbox"/>	1	--					
Watts Negative ROC Detector 2	0	W	0	sec	<input type="checkbox"/>	1	--					
Vars High Level	0	VAR	0	sec	<input type="checkbox"/>	1	--					
Vars Low Level	0	VAR	0	sec	<input type="checkbox"/>	1	--					
Vars Positive ROC	0	VAR	0	sec	<input type="checkbox"/>	1	--					
Vars Negative ROC	0	VAR	0	sec	<input type="checkbox"/>	1	--					

TESLA Configuration a Metering Group for Meter Testing Verification

The next step is to set up a Metering Group so the User can view and verify all the quantities that were configured in the previous pages. The User must remember that this **test example setup** was done with PT and CT ratio of 1:1 so when viewing the metering screen on the TESLA recorder, be sure and select drop down menu at the bottom of metering TESLA metering screen selecting **SECONDARY**. If the user has use the appropriate PT and CT ratios then the user can leave the drop down menu at **PRIMARY**.

Note: View the metering screen by selecting from the drop down menu at the bottom of the metering screen: **Primary** to **Secondary** values.

Metering Group configuration screen:

Select a metered quantity from the tree below and drag it to the appropriate place in the Meter Group Definition.

TESLA Meter Group Definition
Name: 2/3 Meters

	Column 1	Column 2
Row 1	Line:VaMag:line A-VT	Line:VaAng:line A-VT
Row 2	Line:VbMag:line B-VT	Line:VbAng:line B-VT
Row 3	Line:VcMag:line C-VT	Line:VcAng:line C-VT
Row 4	Line:IaMag:line A-CT	Line:IaAng:line A-CT
Row 5	Line:IbMag:line B-CT	Line:IbAng:line B-CT
Row 6	Line:IcMag:line C-CT	Line:IcAng:line C-CT
Row 7	<unassigned>	<unassigned>
Row 8	Line:Watts:Power	Line:Vars:Power
Row 9	Line:VA:Power	<unassigned>
Row 10	<unassigned>	<unassigned>
Row 11	Generator:VaMag:GEN A-B VT	Generator:VaAng:GEN A-B VT
Row 12	Generator:VcMag:GEN C-B VT	Generator:VcAng:GEN C-B VT
Row 13	Generator:IaMag:GEN A CT	Generator:IaAng:GEN A CT
Row 14	Generator:IcMag:GEN C CT	Generator:IcAng:GEN C CT
Row 15	<unassigned>	<unassigned>
Row 16	Generator:Watts:Power	Generator:Vars:Power
Row 17	Generator:VA:Power	<unassigned>
Row 18	<unassigned>	<unassigned>

Buttons: Show Channel Tree, Hide Tree, Show Primary Units, Save/Close

Navigation: Main Menu, Metering, Config Edit

Injecting Analog Channels

Using a relay or metering test set, inject voltages and currents into the configured analog channels of the TESLA recorder. This will verify the operation of metering screen to monitor 3-phase (3-element) line Watt/VAR metering or monitor 3-phase (2 Element) generator Watt/VAR metering. The injection will start with the phase angle between the Voltage and current at 0.0°

Sources

Src	Amplitude	Phase	Frequency	Range	On Enable
VA	69.00	0.0	60.000	75	<input checked="" type="checkbox"/>
VB	69.00	-120.0	60.000	75	<input checked="" type="checkbox"/>
VC	69.00	120.0	60.000	75	<input checked="" type="checkbox"/>
--	0.00	0.0	60.000	75	<input type="checkbox"/>
--	0.00	0.0	60.000	75	<input type="checkbox"/>
--	0.00	0.0	60.000	75	<input type="checkbox"/>
I1	5.000	0.0	60.000	7.5	<input checked="" type="checkbox"/>
I2	5.000	-120.0	60.000	7.5	<input checked="" type="checkbox"/>
I3	5.000	120.0	60.000	7.5	<input checked="" type="checkbox"/>
--	0.000	0.0	60.000	7.5	<input type="checkbox"/>
--	0.000	0.0	60.000	7.5	<input type="checkbox"/>
--	0.000	0.0	60.000	7.5	<input type="checkbox"/>

Master enable

7.5 A, 75.0 V

Multiple Phasors

Fault Rotate

Angle reference: None

Battery: 48 Volts

Logic I/O and Timers

Output:

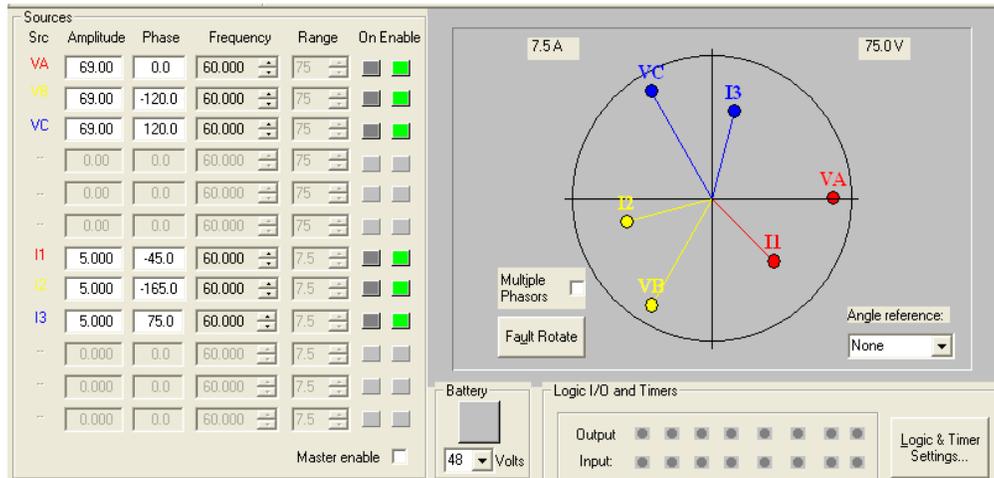
Input:

Logic & Timer Settings...

Meter Reading on the TESLA Metering screen with a phase angle between the voltage and current at 0.0° (viewed in secondary quantities).

Line:Va:line A-VT:Mag:	69.001 V	Line:Va:line A-VT:Ang:	0.000 °
Line:Vb:line B-VT:Mag:	69.000 V	Line:Vb:line B-VT:Ang:	-119.98 °
Line:Vc:line C-VT:Mag:	69.003 V	Line:Vc:line C-VT:Ang:	120.007 °
Line:Ia:line A-CT:Mag:	5.000 A	Line:Ia:line A-CT:Ang:	-0.576 °
Line:Ib:line B-CT:Mag:	5.000 A	Line:Ib:line B-CT:Ang:	-120.46 °
Line:Ic:line C-CT:Mag:	5.000 A	Line:Ic:line C-CT:Ang:	119.481 °
Line:Watts:Power:	1034.98 W	Line:Vars:Power:	9.532 VAR
Line:VA:Power:	1035.03 VA		
Genator:Va:GEN A-B VT:Mag:	119.999 V	Genator:Va:GEN A-B VT:Ang:	30.141 °
Genator:Vc:GEN C-B VT:Mag:	119.998 V	Genator:Vc:GEN C-B VT:Ang:	90.026 °
Genator:IaMag:GEN A CT:	5.000 A	Genator:IaAng:GEN A CT:	-0.519 °
Genator:IcMag:GEN C CT:	5.001 A	Genator:IcAng:GEN C CT:	119.562 °
Genator:Watts:Power:	1038.57 W	Genator:Vars:Power:	10.020 VAR
Genator:VA:Power:	1038.62 VA		

The next injection will show the 3 phase voltages and currents are offset by the current at -45.0°.



Meter Reading on the TESLA Metering screen with a phase angle between the voltage and current at -45.0° (viewed in secondary quantities).

Line:Va:line A-VT:Mag:	69.010 V	Line:Va:line A-VT:Ang:	0.000 °
Line:Vb:line B-VT:Mag:	69.010 V	Line:Vb:line B-VT:Ang:	-119.98 °
Line:Vc:line C-VT:Mag:	69.011 V	Line:Vc:line C-VT:Ang:	120.008 °
Line:Ia:line A-CT:Mag:	5.001 A	Line:Ia:line A-CT:Ang:	-45.574 °
Line:Ib:line B-CT:Mag:	5.001 A	Line:Ib:line B-CT:Ang:	-165.46 °
Line:Ic:line C-CT:Mag:	5.001 A	Line:Ic:line C-CT:Ang:	74.480 °
Line:Watts:Power:	725.290 W	Line:Vars:Power:	738.830 VAR
Line:VA:Power:	1035.33 VA		
Genator:Va:GEN A-B VT:Mag:	120.015 V	Genator:Va:GEN A-B VT:Ang:	30.141 °
Genator:Vc:GEN C-B VT:Mag:	120.012 V	Genator:Vc:GEN C-B VT:Ang:	90.026 °
Genator:IaMag:GEN A CT:	5.001 A	Genator:IaAng:GEN A CT:	-45.529 °
Genator:IcMag:GEN C CT:	5.001 A	Genator:IcAng:GEN C CT:	74.556 °
Genator:Watts:Power:	727.317 W	Genator:Vars:Power:	741.737 VAR
Genator:VA:Power:	1038.82 VA		