Wind Solar Trimetric Diagram

Bogart Eng.



calibre 1.26.0

Notes on connecting the TriMetric to measure Solar input only, or Wind input only.

The TriMetric may be connected so that it measures only input from a wind or solar source, rather than the more usual connection that shows the "net" input and output from the batteries. The suggested connections are shown on the other page.

1. **The basic principle** for measuring "amps" and "amp hours" is to place the shunt in the NEGATIVE path that interrupts the current that you wish to measure. That is what is shown on the diagram. The same principle could be used to measure only load current, or to measure the combined (sum of) solar and wind input on one meter if that were desired.

2. **Choosing a shunt.** You may want to use a 100A/100mV shunt for measuring wind or solar input to reduce the amp hour error. The reason is that the more common 500A/50mV shunt resolves current down to 0.1 amp. This implies a possible uncertainty in amp hours of 24(hours) x .1 amp per day, or 2.4 amp-hr per day. By using the 100A/100mV

shunt this can be reduced to 1/10 of that, to 0.24 amp hours/day. But note that a typical "100A/100mV" should be only used when the wind or solar input is less than 75 amps to avoid overheating these shunts.

3. The connections shown on the diagram for the "wind" and "solar" measurements cause the "AMPS" value on the meter to read a NEGATIVE value when the sun is shining, or the wind is blowing. This will also cause the "AMP

HOURS FROM FULL" to become MORE NEGATIVE as more energy is accumulated. This is counter intuitive, and if you wish to have the incoming amps read POSITIVE instead, just reverse the connections between G2 and Sig to the meter. (But be sure to read note 5 below) The reason for the suggested wiring is that you can then use *two* of the meter functions for accumulating the "amp hours" from these sources. One can be used for a short term measurement (like an hour, day or perhaps a week) whereas the other can accumulate production over months or a year. If you wire it with the amps (and amp hours) coming in as a positive number, you won't have available the longer term measurement.

To measure "short term" amp hours, use the "**Amp Hours From Full**" display (that's the first of the 6 items in the

"Extra data" group on the bottom of the TriMetric label.) This one will measure amp hours from 0.01 to 9,999 amp hours, however the "amp hours" will read as a negative number.

The **"long term" measurements of "amp hours"** can be made with the "Cumulative Batt Amp Hour" display, which in this case will not measure battery amp hours, but will measure accumulated amp hours from 1 to 999,000 amp hours. These will also read as a negative number.

So how can this 3 digit display show above 999 amp hours? Answer: When the display is above 999 amp hours the display will show with a **flashing decimal point**. This means "multiply the number by 1000". If you see 1.02 with flashing decimal point, that means 1020 amp hours.

4. Resetting amp hours: Either the long or short term amp hour numbers may be reset manually at any time. While observing the one you wish to reset--push and hold the RESET button for about 4 seconds until the display STAYS

at 0. A quick push will not reset it.

IMPORTANT PROGRAMMING NOTES: Also refer to page 13 of TriMetric TM-2020 instructions for more detail on programming the TriMetric . These instructions are available on the web site.

5. To insure that the meter does not automatically reset the amp hours to 0, be sure to program the "PREFERENCES"

setting to P02 or P03. Use SELECT button to go to the "blank" display, right after "Battery % Full". Then hold SELECT down and quickly push RESET to go into the program mode. Use RESET to program **P02** or **P03** --Not P00 or P01.

6. If you have wired the meter up so that amps come in as a POSITIVE number, then you must also program the

"Efficiency factor" to 100, which is shown by a "00" in the programmed display. (Otherwise the AmpHours will accumulate at a lower percentage than "true".) To program this, use the SELECT button to show the "Battery %

Full" display. Then hold SELECT down and quickly push RESET to go into the program mode. Use RESET to program H00 or L00 (depending on the shunt type you are using.) BOGART ENGINEERING

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M+ terminal must be connected to + with

short wire (except as noted on page 3 of instructions "For unusual cases...").

NOTE: Twisted pair wire

NOTE:

SIG

is not normally needed.

Magnified view of 5 SCREW

But if used, do it this

TERMINAL STRIP located on

G2

G1

way.

circuit board.

+

M

S

G

G

+IG 2 1

+

Wind Charge

Solar Charge

controller

controller

NOTE: The SIG wire

NOTE:

must be connected to

+

-

+

-

Back view of **TriMetric** the small screw (kelvin connection) on the

battery monitor (without shunt, not the larger bolt back cover.)

which connects to the

battery. Otherwise

"amps" measurements

SIG G2 G1

FOR SAFETY: Place

FOR SAFETY:

a

will be inaccurate.

SHUNT: 50 MV/500 AMP

To Wind measuring

2 amp (fast blow) fuse

OR 100 MV/100 AMP

meter terminals

in series

with

the

+

wire

Wind Shunt

IMPORTANT: Be sure the

IMPORTANT

near the battery, as

near the battery,

negative lead from your

shown. That

way,

way, if

solar charge controller is

there is

ever

a

short

NOT connected here-- but

SIG

G1

between this

wire

and

G2

to the other side of the

SHUNT: 50 MV/500 AMP

OR 100 MV/100 AMP

the other wires, you shunt. Otherwise the To Solar measuring

Solar Shunt

won't melt down the TriMetric will not measure meter terminals

wires,

you

will

only

blow

your solar amps.

the

fuse.

SYSTEM GROUND (if used)

Be sure the minus terminal of charge controller, inverter, Be sure the minus terminal of charge controller, inverter

+

and all other loads and chargers connect here (not the negative post of battery).

IG

G1

S

- TO OTHER CHARGING SYSTEMs AND ALL LOADS

TO OTHER CHARGING SYSTEMs AND

12 OR 24 VOLT

(INVERTER, ETC.)

G2

+

BATTERY

BATTERY

SYSTEM.

SHUNT

NOTE: Use

either a 50 mv/500 amp shunt or 100

mv/100 amp shunt. Shunt

must

be

connected

to

minus

SHUNT: 50 MV/500 AMP

side of

battery.

battery. *To read correct current and amp-hours,* OR 100 MV/100 AMP

TriMetric battery monitor must be programmed for correct shunt type being used, as described in instructions.

TriMetric BATTERY MONITOR CONNECTIONS

TriMetric

. How to connect additional TriMetrics for measuring SOLAR/WIND inputs only BOGART ENGINEERING 8/1/04

BATTERY MONITOR CONNECTIONS

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