Date: July 10, 2006

PTE-50-CET

Getting the most out

A NORAM SMC® application note

INTRODUCTION

There are three methods of increasing the output capability of the PTE-50-CET –

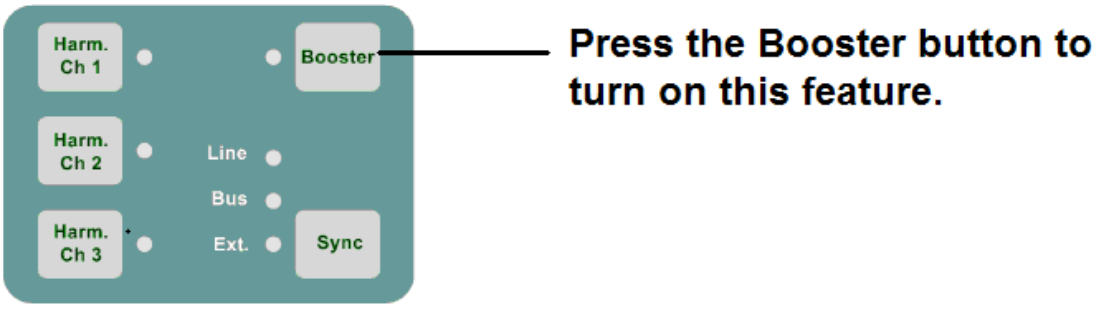
a) The Booster – Increases the VA output but not the current output.

b) Paralleling Current – Increases the current amplitude and VA

c) Series Current – Increases the VA while keeping the maximum current the same.

When to use the Booster

If at any time during testing the current channel being used goes in to an alarm condition, turn on the Booster. This alarm indicates that the load is too high for the desired current.



By turning on the booster the voltage available to push the current is doubled. If the booster does not provide enough VA to achieve the desired current refer to paralleling or series the currents.

By default the amplifiers put out half VA. The booster enables full power to the amplifiers. This feature is designed to increase the life of the amplifiers.

Paralleling Current Channels

Getting the desired current out of a PTE-50-CET can sometimes take some creative thinking and ingenuity.

There are many applications where paralleling two or three channels together will accomplish the desired result.

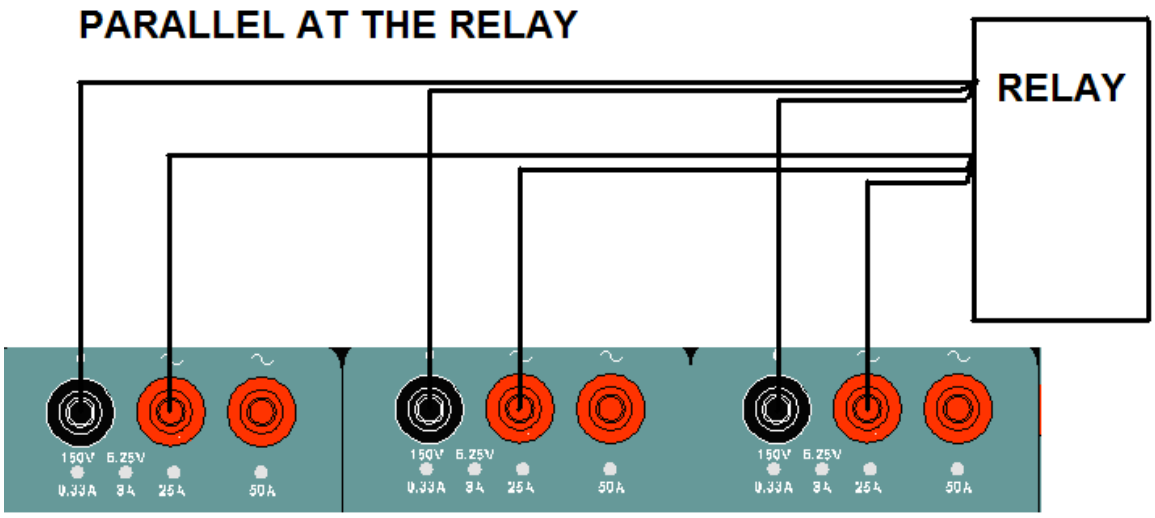
Let's say that an over-current relay with a .1 amp tap is being tested. If the desired current is 0.8 amps the first inclination might be to try the 8 amp tap on one source but chances are that a 0.1 amp tap will have a burden that exceeds the capability of the 8 amp tap. If all three 0.33 amp taps were to be paralleled there would be over 150 volts available to push the 0.8 amps where the 8 amp tap has only 12.5 volts to push the 0.8 amps.

Steps to parallel three channels together:

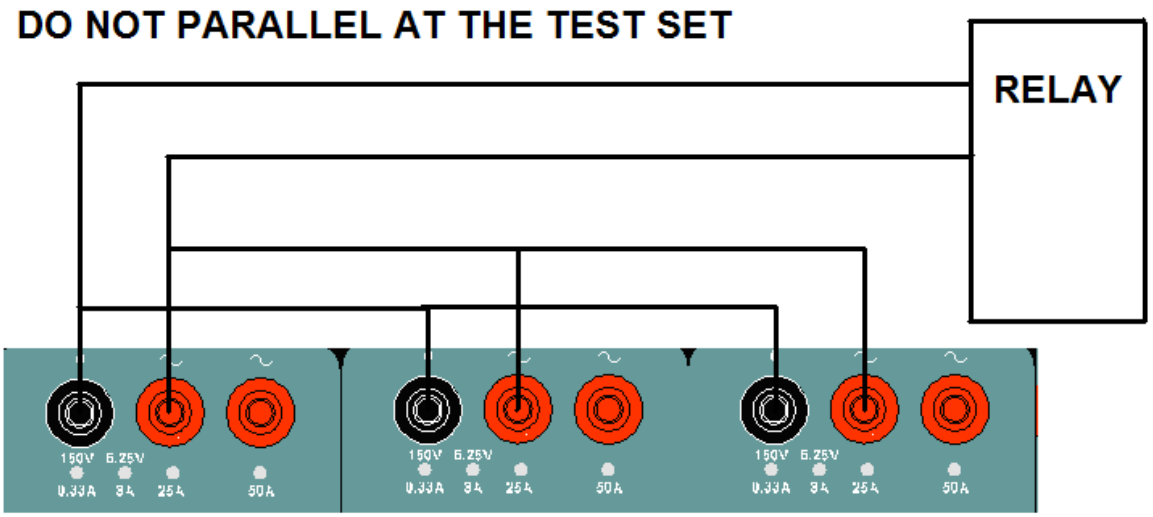
1. Set the phase angles on all three channels to zero.
2. Select channel 1 to be master and channels 2 & 3 to be slaves
3. Press the tap selection switch on channel 1 until all three channels are on the proper tap. (0.33 amp tap for this example)
4. Dial in the desired current by adjusting the amplitude knob on channel 1. (remember the total current is the sum of all three currents together)
5. Turn on the current by pressing the 'ON/OFF' button of channel 1

Some helpful hints:

Paralleling at the relay will provide the best results because three sets of leads will carry equal amounts of current all the way to the load.



Paralleling at the test set is one of the most common mistakes made. By paralleling at the test set three times the current is passed through one set of test leads instead of sharing that load across three sets of leads.



This may not sound like it would make a big difference but the more current needed the larger effect this has on the end result.

Always use the larger current test leads as opposed to the lighter voltage test leads. The biggest enemy of current carrying capacity is resistance and the current leads are larger and therefore have less resistance.

Here are some additional situations where paralleling two or three channels will help achieve the desired current:

Requirement:	***Less that 16 amps are required but it cannot be achieved out of the 25 amp tap of one channel.***
Solution:	Use Two 8 amp channels. This combination gives you 16 amps at 12.5 volts rather than 16 amps at 4 volts when using one channel on the 25 amp tap.
Requirement:	***Less that 24 amps are required but it cannot be achieved out of the 25 amp tap of one channel.***

Solution:	Use Three 8 amp channels. This combination gives you 24 amps at 12.5 volts rather than 24 amps at 4 volts when using one channel on the 25 amp tap.
Requirement:	***Less that 50 amps are required but it cannot be achieved out of the 50 amp tap of one channel.***
Solution:	Use Two 25 amp channels. This combination gives you 50 amps at 4 volts rather than 50 amps at 2 volts when using one channel on the 50 amp tap.
Requirement:	***Less that 75 amps are required but it cannot be achieved out of the 50 amp taps of two channels.***
Solution:	Use Three 25 amp channels. This combination gives you 75 amps at 4 volts rather than 75 amps at 2 volts when using two channels on the 50 amp tap.

Any amount of current between 75amps and 150 amps will be achieved by paralleling all three 50 amp taps.

Series Currents

Sometimes the required current falls into another range. An example would be a current of 8 amps or less requiring 25 volts to push it. This can only be achieved if we series two 8 amp taps together. By putting the two channels in series we are still limited to 8 amps but have doubled the voltage to push it through the load. To do this with the PTE-50-CET the optional PTE-SER series bars are required.

PTE-SER option allows two or three channels to be connected in series.

As seen in the picture the series bars connect to the PTE-50-CET only one way. Connections to the load are made on either side of the series bar. In the picture above the connection to the load would be made from the black common tap of channel one and the red polarity tap of channel two. Setting the current amplitude and phase would be done on channel one.

Possible combinations

All possible combinations are as follows:

Series Bar #1 (Three channels 25 amp tap range)	0.33 amps at 450 volts 8 amps at 37.5 volts 25 amps at 12 volts
Series Bar #2 (Three channels 50 amp tap range)	50 amps at 6 volts
Series Bar #3 (Two channels 25 amp tap range)	0.33 amps at 300 volts 8 amps at 25 volts 25 amps at 8 volts

Detailed example of using the series bar

Requirement: ***Less than 8 amps are required but 24 volts are required to achieve the 8 amps.***

Solution: Use Series bar #3 which will series two channels together according to the following procedure:

1. Connect the series bar as shown above and select the 8 amp tap. Each series bar can only be plugged in to the PTE-50-CET one way.
2. The pigtail on the bar is plugged into the connector that is plugged into the PTE-BUS/RS232 connection. The test set will automatically reset to series the two channels together.
3. Press the tap button until the 8 amp tap is selected.
4. Connect to the load under test (Black tap of channel one and red 25 amp tap of channel two)
5. Dial the desired current and phase angle on channel one.
6. Turn on using the 'ON/OFF' button of channel one.

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