



Remote Commands

REMOTE CONTROL

When attached to a LeCroy oscilloscope equipped with a ProBus interface, the AP033 Active Differential Probe can be remotely controlled, along with the other oscilloscope functions. The control interface can be either the RS-232-C or IEEE-488 (GPIB) buses. The commands that control the probe are described below. The text for the command descriptions is formatted in a style consistent with the oscilloscope command descriptions contained in the *Remote Control Manual* supplied with the oscilloscope. Please refer to that manual for additional information on the remote control buses and the conventions used in the command descriptions.

Many of the commands begin with the **PRx:** prefix, where “x” is the channel to which the AP033 Active Differential Probe is connected. These commands are similar to the channel commands that use the prefix **Cx:**. The difference is that **PRx:** refers to the probe tip, whereas **Cx:** refers to the oscilloscope input connector. For example, **PRx:VDIV** sets the volts per division at the probe tip, while **Cx:VDIV** sets the volts per division at the BNC input connector, without factoring the gain or attenuation of the AP033 probe. The **PRx:** form of these commands is only active when the AP033 Active Differential Probe is connected to the selected channel. An error will result when an AP033-specific command is sent to the oscilloscope without a differential probe attached to the selected channel.

COMMAND LIST

ATTENUATION	Selects the input attenuation of the probe
AUTOZERO	Initiates an autozero cycle in the probe
GAIN	Selects the gain of the probe
COUPLING	Selects the input coupling of the probe
OFFSET	Selects the probe offset voltage
VDIV	Selects the vertical scale factor of the probe /oscilloscope system



GAIN CONTROL MODE

The AP033 Active Differential Probe has two modes for setting the probe gain and attenuation: Auto and Manual. (Refer to Chapter 3, “Operation with LeCroy Oscilloscopes,” for more information.) The gain control mode can be selected in the AP033 control menu through the oscilloscope’s front panel, or by remote control commands that correspond to the gain mode.

Sending the PRx:ATTEN or PRx:GAIN commands will set the AP033 Probe to Manual gain control mode.

Sending the PRx:VDIV command will set the AP033 Probe to Auto gain control mode.

PROBE

ATTENUATION, ATTN Command/Query

DESCRIPTION

The ATTENUATION command sets the internal attenuation of the differential probe, including the factor of the external $\div 10$ plug-on attenuator. The command will also switch the Atten/Gain control mode to Manual if it was in Auto. The command is only valid when the external $\div 10$ plug-on attenuator is not being used. When the external $\div 10$ plug-on attenuator is attached, the attenuation is fixed at $\div 100$.

The ATTENUATION? query returns the attenuation of the differential probe connected to the specified channel. The query form is always valid.

COMMAND SYNTAX

<channel>:ATTenuation <attenuation>

<channel> : = {PR1, PR2, PR3, PR4}

<attenuation>: = {1, 10 } when the external $\div 10$ plug-on
attenuator is not being used.
{100} when the external $\div 10$ plug-on
attenuator is attached.

QUERY SYNTAX

<channel> :ATTenuation?

RESPONSE FORMAT

<channel> :ATTN <attenuation>

EXAMPLE

The following command sets the attenuation of the AP033 differential probe connected to channel 1 to $\div 10$:

CMD\$="PR1:ATTN 10": CALL IBWRT(SCOPE%,CMD\$)



PROBE

AUTOZERO, AZ Command

DESCRIPTION

The AUTOZERO command initiates an autobalance cycle in the differential probe to remove any offset drift.

The probe input must be disconnected from any signal source for the autozero to work properly.

COMMAND SYNTAX

<channel>:AutoZero

<channel> := {PR1, PR2, PR3, PR4}

EXAMPLE

The following command initiates an autobalance in the AP033 differential probe attached to channel 1:

```
CMD$="PR1:AZ": CALL IBWRT(SCOPE%,CMD$)
```

PROBE

COUPLING, CPL

DESCRIPTION

The COUPLING command selects the coupling mode of the specified input channel. With the AP033 probe, AC coupling is selected by manually installing the AC Coupling adapter on the probe tip. Therefore, COUPLING can only select between the coupling mode determined by the presence or absence of the AC Coupling adapter and Grounded.

The COUPLING? Query returns the coupling mode of the selected channel.

COMMAND SYNTAX

<channel> :CouPLing <coupling>

<channel> : = {PR1, PR2, PR3, PR4}

<coupling> : = {D1M, GND} (without AC coupling adapter installed)

<coupling> : = {A1M, GND} (with AC coupling adapter installed)

QUERY SYNTAX

<channel> :CouPLing?

RESPONSE FORMAT

<channel> :CPL <coupling>

EXAMPLE

The following command sets the coupling to DC in the AP033 differential probe connected to channel 2:

```
CMD$="PR2:CPL D1M ": CALL IBWRT(SCOPE%,CMD$)
```



PROBE

GAIN, GAI
Command/Query

DESCRIPTION

The GAIN command sets the probe gain. The command also switches the Atten/Gain control mode to Manual if it is currently in Auto. The valid arguments are 1 or 10.

The GAIN? query returns the gain of the probe connected to the specified channel.

COMMAND SYNTAX

<channel>:GAI <gain>

<channel> : = {PR1, PR2, PR3, PR4}

<gain> : = {1, 10}

QUERY SYNTAX

<channel> :GAI?

RESPONSE FORMAT

<channel> :GAI <gain>

EXAMPLE

The following command sets the gain of the AP033 differential probe connected to channel 1 to x10:

```
CMD$="PR1:GAI 10": CALL IBWRT(SCOPE%,CMD$)
```

PROBE

OFFSET, OFST Command/Query

DESCRIPTION

When an AP033 differential probe is connected to a channel, the OFFSET command sets the probe offset value. The oscilloscope channel offset is always 0 volts.

The maximum range and resolution is determined by the attenuation of the differential probe. If an out-of-range value is entered, the differential probe will set the probe offset to the closest valid value and the VAB bit (bit 2) in the STB register will be set.

The OFFSET? query returns the offset voltage of the differential probe connected to the specified channel.

COMMAND SYNTAX

<channel>:OFfSeT <offset>

<channel> : = {PR1, PR2, PR3, PR4}

<offset> = {-0.400V to +0.400V} with ÷1 attenuation or
= {-4.0V to +4.0V} with ÷10 attenuation or
= {-40V to +40V} with ÷100 attenuation

Note: The suffix V is optional

QUERY SYNTAX

<channel> : OFfSeT?

RESPONSE FORMAT

<channel> : OFST <offset>

EXAMPLE

The following command sets the offset at the probe tip of the AP033 differential probe connected to channel 1 to 100 mV:

```
CMD$="PR1:OFST .1": CALL IBWRT(SCOPE%,CMD$)
```



PROBE

VOLT_DIV, VDIV
Command/Query

DESCRIPTION

The VOLT_DIV command sets the vertical sensitivity at the probe tip. The effective gain of the differential probe, including the external plug-on attenuator, is factored into the vertical sensitivity. The command also sets the Atten/Gain control mode to Auto, if it is currently in Manual mode.

The valid range of arguments is affected by the presence of the plug-on attenuator. If an out-of-range value is entered, the oscilloscope will set the vertical sensitivity to the closest valid value, and will set the VAB bit (bit 2) in the STB register.

The VOLT_DIV? query returns the vertical sensitivity at the probe tip of the specified channel.

COMMAND SYNTAX

<channel> :Volt_DIV <sensitivity>

<channel> := {PR1, PR2, PR3, PR4}

<sensitivity> := See Section 3 Table 2 for valid arguments.

Note: the suffix V is optional.

QUERY SYNTAX

<channel> :Volt_DIV?

RESPONSE FORMAT

<channel> :VDIV <sensitivity>

EXAMPLE

The following command sets the vertical sensitivity at the probe tip of the AP033 differential probe connected to channel 3 to 2 Volts/Division:

```
CMD$="PR3:VDIV 2": CALL IBWRT(SCOPE%,CMD$)
```

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