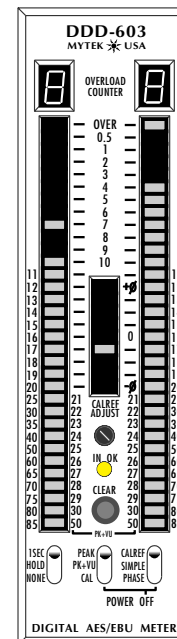


# DDD-603

DIGITAL AES/EBU/SPDIF METER



## *Reference Manual*

Revision 7/96  
(V.3.3 & V.1.3)

MYTEK \* USA

## Operation: Normal peak mode:

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MYTEK  USA

For technical support in the US call  
212-388 2677

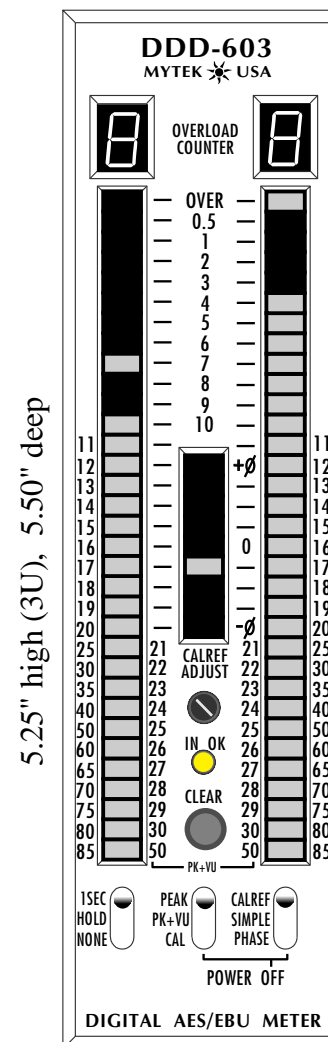
Overseas contact your dealer.

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Internet: <http://www.mytekdigital.com>

ACTUAL SIZE

1.425" wide  
12 units fit  
into 19" rack



Overload counter counts every time the "over" l.e.d. is lit. The counter counts up to 10. "E" reading means 10 or more. The counter can be cleared by "clear" button. It also can have other functions- See "Software versions"

"Over" l.e.d. shows true digital overload (after 3 subsequent samples exceed max. range). It can be set to display just the 0 dB level or overs of different sample

The L and R bargraph indicates peak value of the signal. The meter ballistics are carefully managed by internal software to naturally represent incoming sound.

The highest lit l.e.d. (including "over" l.e.d.) can be held for 1 sec., memorized or immediately turned off. These functions are controlled by switch A. Memorized segment can be cleared by "clear" button.

The middle small bargraph has two functions controlled by switch C. In the "phase" mode it serves as a phase correlation meter (**only in the "full" version of software**). In the "0 VU ref" mode the bar shows 0 VU reference level. -See "Calibration mode".

"In OK" l.e.d. shows presence of input AES/EBU signal i.e. indicates proper digital connection.

Position "simple" of the switch C leaves active the L and R bargraph only. The overload counter and the middle bargraph are turned off. This feature facilitates equipment operation during long hours of studio work.

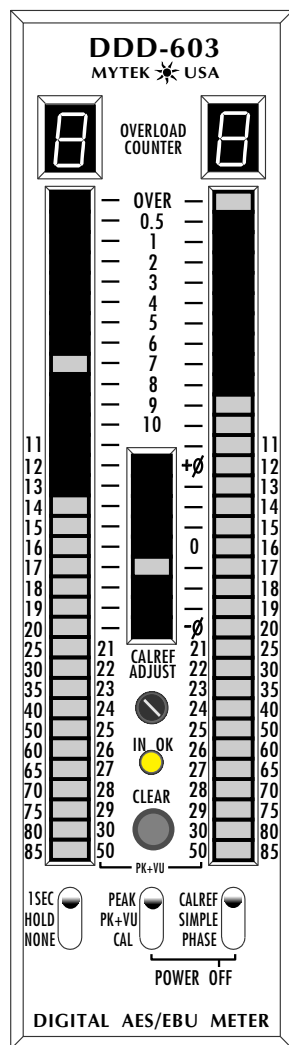
**Note:**  
**No phase meter in basic software version V1.3 (only V3.3-"full mastering")**

Mytek supplies various rackmounting hardware for the DDD-603 meter. Contact your dealer or Mytek for more info.

## Operation: VU+peak mode:

The VU (integrated) level (unlike the peak level) represents the perceived loudness of the program.

Scale is different to that of the peak mode. In order to correspond visually to an analog VU meter scale is linear (1 dB steps) all the way down. Last segment of -50dB functions as "signal present" indicator. Lower segments values in VU mode are these on the inner side of the bargraphs.



— "Over" i.e.d. shows the overload of the peak value, exactly as in NORMAL PEAK MODE.

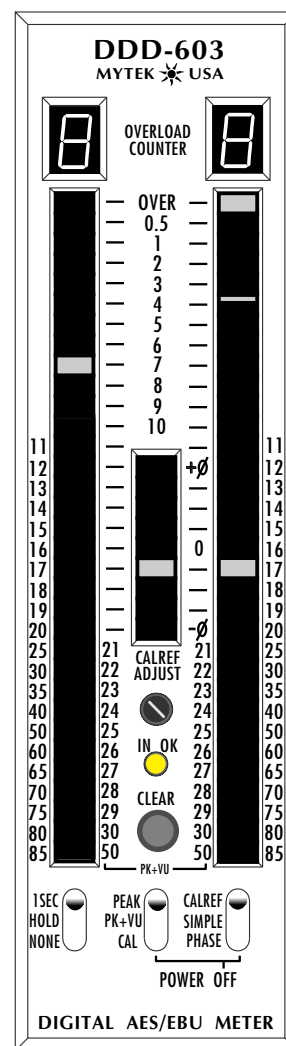
— The "floating dot" segment represents the peak value of the signal. If switch A is set to "none" the dot just moves according to the actual peak value. If "1 sec." or "hold" is selected it is held appropriately

— The L and R bargraph represent the VU (integrated) value of the signal. By definition it is always lower than the peak value. The VU value represents the perceived program volume.

— All other functions work as in NORMAL PEAK MODE.

## Operation: Calibration mode:

This mode is used to set the A/D converter input levels or to fine adjust the levels of a digital attenuator, digital mixer or other digital equipment.



— The overload counter works normally.

"Over" i.e.d. shows the overload of the peak value, exactly as in NORMAL PEAK MODE. The "1 sec." and "hold" functions are disabled i.e. the position of switch A is not important.

The "floating dot" segment represents the peak value of the signal. The resolution of the bargraphs L and R is increased to 0.2 dB per step versus the selected "0 VU reference level". In this example the reference level is set at -14 dB below full scale. The segment "14" of the L/R bargraph means -14 dB, segment "15" means now -14.2 dB, segment "13" is -13.8 dB and so on.

The middle bargraph shows selected 0 VU level reference. It is selected using "0 VU adjust" trimpot. The reference can be set in 1 dB steps between -12 dB and -20 dB level. In other words it represents how much headroom you have left. The choice depends on type of music, recording method and type of the A/D converter used. In most situations a level between -14 and -16 dB works well. On this drawing the reference level is set at -17 dB.

## Operation: What you see is what you get!

There are two important things about the DDD-603 meter:

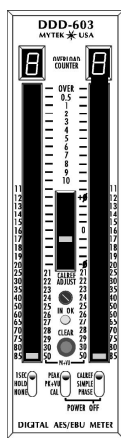
1. The standard overloads shown (3 samples) are exactly these seen later on 1630 mastering tape- you can be sure your master is CD- ready.
  2. The meter is fully digital. It is DSP based and not even one sample is ever missed or misinterpreted- everything is shown with 0.00003% accuracy ( $1/2^{exp15}$ ). The numbers on the scale are rounded to the nearest integer.
- In other words- you can always trust it - What you see is what you get!

As you use the meter you will find it extremely useful for variety of things- it will warn you immediately of any strange behavior of your digital equipment and show you the quality of your recordings: the noise or hum and the dynamics of the music.

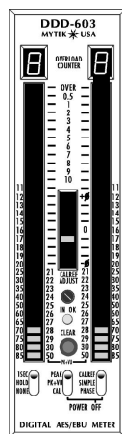
The operation of the DDD-603 is very easy, but the interpretation of some readings requires little experience. We have shown here some examples of "strange" readings:

Noise floor: white noise or hum:

In most studio situations there will be some noise floor showing up at the analog input of your digital system (A/D converter). Ideally it should be below -80dB but in many large mixing setups can be quite high- as much as -70 dB. If you see excessive noise try to determine its character by turning up the volume and listening. If you hear hum, you should look for ground loops and eliminate them. If there is too much broadband noise try to cut unused console channels, reverb returns etc. Please try "Extended bottom of the scale" mode.



Ideal (low) noise floor.

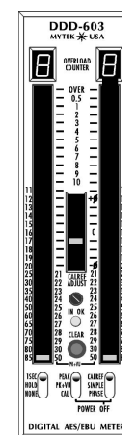


Maximum acceptable noise floor.

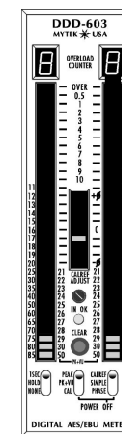
DC offset:

All of A/D converters (including DAT machines etc..) produce so called DC offset. DC offset is a very small DC voltage present in the digital audio signal. It is inherent to digital systems because they are "DC coupled", in other words have frequency response from 0 Hz up. Ideally the DC offset is zero, but in a real life it sometimes can be very high. Most A/D converters produce an offset of few LSBs which is negligible. Occasionally however you can get a strange reading of a level you can't hear. It is probably the DC offset. You can't hear it because it is 0 Hz. To eliminate the offset you should disconnect the inputs of the A/D to make sure this is the problem. Connect the inputs back, then try resetting the A/D by turning the power off/on. Sometimes the offset may originate from the console output, but most converters will compensate for that. Some equipment can produce small DC offset after warming up because of the thermal drift. It is a good practice to always warm digital equipment for few hours and then reset it before use. Excessive DC offset does not affect the sound quality, but can cause edit "clicks" if the program is later digitally edited. The DC offset can be eliminated from existing recordings by DSP filtering with a high-pass digital filter set for example at 1 Hz or by using special DC-shift method available at some mastering labs. The second method is better because it does not alter the sonic quality of the program.

Note that the level of DC offset and noise always add together. Please try "Extended bottom of the scale" mode.



Low DC offset.

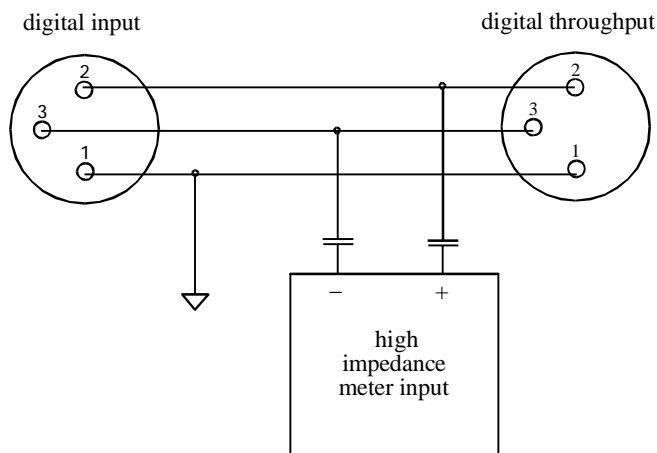


Maximum acceptable DC offset.

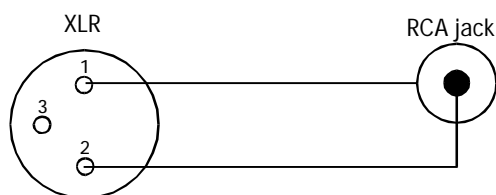
## Setup: Connections:

The DDD-603 meter is capable of reading both AES/EBU and S/PDIF signals. Two XLR connectors on the back of the unit are wired according to AES/EBU specs and an adaptor described below should be used for S/PDIF signals. The meter input is high impedance with minimal effect on the clock jitter. We found this type of in/out superior to a regular 110 Ohm buffered in/out. In most situations the meter can be daisy-chained, but in jitter critical applications (such as DAC inputs) it should be connected at the end of the signal chain. The DDD-603 input/output is wired as below:

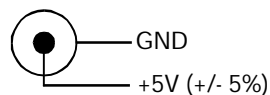
### Internal in/out wiring



### S/PDIF adaptor



### Power supply



The DDD-603 meter requires regulated +5V supply with min. of 1.5A capacity. Every meter is supplied with such a power adaptor. Using different power supply may **damage the unit and voids warranty.**

## Additional features and software versions:

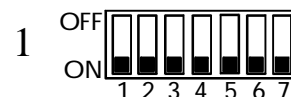
The DDD-603 meter is software based. Mytek manufactures two versions of the meter: "basic" - V1.3 and "full mastering" - V3.3. The features described previously (**except for the phase meter**) are "basic" features. "Full mastering" software V3.3 provides extra features which can be enabled by setting the DIP switch on the back panel of the unit. The switch works only if software version V3.3 or higher is installed (it is disabled in the "basic" version V1.3). Version V3.3 has also a **phase meter** function selectable at the front panel. For additional cost owners of the "basic" version can upgrade to "full" version by exchanging the internal custom memory chip at your dealer or Mytek.

### "Basic" version V1.3

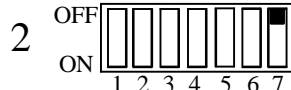


Basic features, **no phase meter**. The DIP switch is disabled. **Overs of 3 samples or more as in 1630.**

### "Full mastering" version V3.3



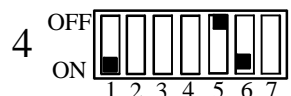
All basic features enabled (as in V1.3) **plus the phase meter**. **Overs of 3 samples or more as in 1630.**



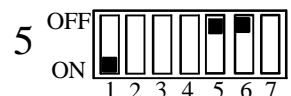
V3.3- 7 segment display shows **number of samples overloaded in last overshoot**. E means 10 or more. Use it to determine how bad the overload is and to track overs. The counter cannot be reset manually, it will reset itself every time the over occurs.



V3.3- Overload led is lit if **1 or more samples are overloaded**. This feature as well as 4 and 5 can be used when an "overload standard" other than **Sony 1630** is used.



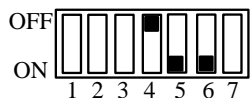
V3.2- Overload led is lit if **2 or more samples are overloaded**.



V3.3- Overload led is lit if **4 or more samples are overloaded**.

— means either position

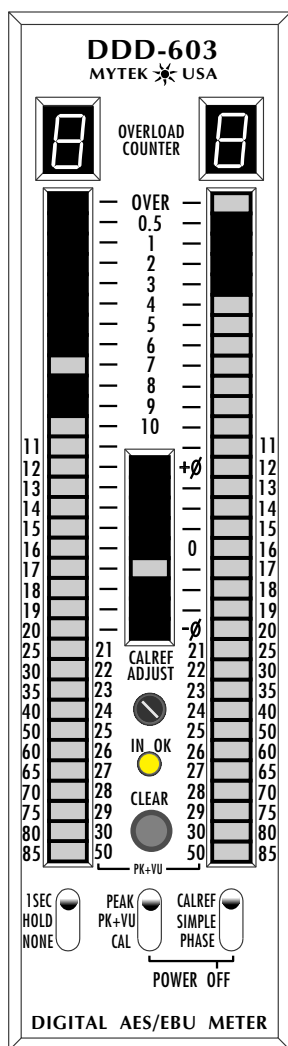
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**V3.3- Extended Top of the scale-** Top of the scale is extended as shown below. Functions 3,4 and 5 are disabled (overloads of 3 or more samples as in basic version or the 1630).

This function is usefull to check the master tape before sending it out to a CD plant. It may not be practical for mixing or tracking.

These are "Extended Top" values in dB's below the full scale.



OVER  
0.5  
1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
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85

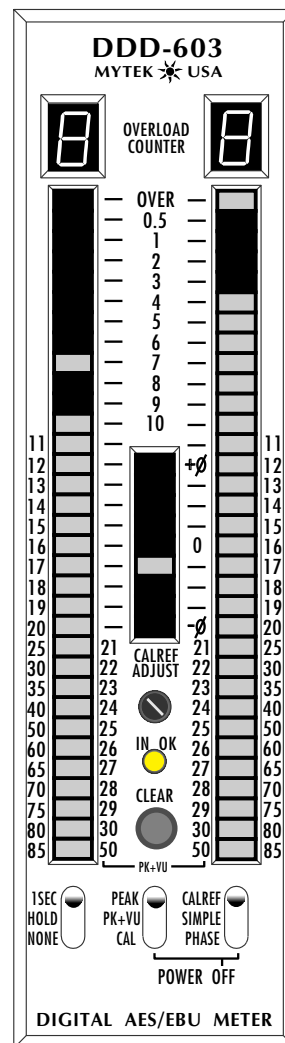
The middle bargraph shows -3dB level and cannot be adjusted unless in calibration mode.

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**V3.3- Extended bottom of the scale:** Bottom of the scale is extended as shown below. Functions 3,4 and 5 are disabled (overloads are of 4 or more samples- (we had to do it this way)). This function is designed to allow the user to check any potential problem in the digital audio signal such as noise floor or DC offset.

These are "Extended Bottom" values in dB's below the full scale.



OVER  
0.5  
1  
2  
3  
6  
10  
14  
20  
30  
40  
50  
55  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
71  
72  
73  
74  
76  
78  
80  
84  
90

The middle bargraph shows -60dB level and cannot be adjusted unless in calibration mode.



**V3.3- OVER light as 0 dB-** In this mode the Over light is always triggered when ONE or more samples are over (=7FFF). The counter however is still triggered depending on how you set the switches 5 and 6. This mode allows you to push the program level up a bit because now meter recognizes the difference between over and 0 dB. Now you can use the counter as an overload indicator and over led as a 0 dB level indicator.

## Warranty

This digital meter is warranted by Mytek to the original purchaser, against defects in workmanship and materials used in manufacture for a period of one year, from the date of shipment.

Faults due to purchaser misuse, unauthorized modifications or accidents are not covered by this warranty.

No other warranty is expressed or implied.

Any faulty unit should be sent, shipping prepaid, to the manufacturer. the serial number of the unit should accompany any request for service.

This digital meter ser# \_\_\_\_\_ was sold to:

\_\_\_\_\_

on \_\_\_\_\_

authorized signature \_\_\_\_\_

For technical support in the US call:  
212-388 2677

or email: [techsupport@mytekdigital.com](mailto:techsupport@mytekdigital.com)  
Overseas contact your dealer.

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