OPERATIONS MANUAL
LEVEL MAGIC

d06
b46
C8046

2ch digital audio leveller

d06

LEVEL MAGIC™

jünger audio

JÜNGER AUDIO - Studiotechnik GmbH
Justus-von-Liebig-Str. 7, D - 12489 Berlin, GERMANY
Tel.: +49 30 6777210, Fax.: +49 30 67772146

www.junger-audio.com

FOREWORD

1

Thank you for buying and using the 2-channel Digital Audio Level Processor d06.

You have acquired the latest generation of digital dynamic range processing and also a piece of equipment which is unique in its design and specification.

Please read this manual carefully to ensure you have all the information you need to use the 2 - channel Digital Audio Level Processor d06.

The unit was manufactured to the highest industrial standards and went through extensive quality control checks before it was supplied.

If you have any comments or questions about installing, setting-up or using the d06, please do not hesitate to contact us.

CONTENT

FUNCTIONAL DESCRIPTION

2

2.1 BASIC DESCRIPTION

The digital dynamics processor d06 is a professional studio device that is performing automated levelling of digital audio signals.

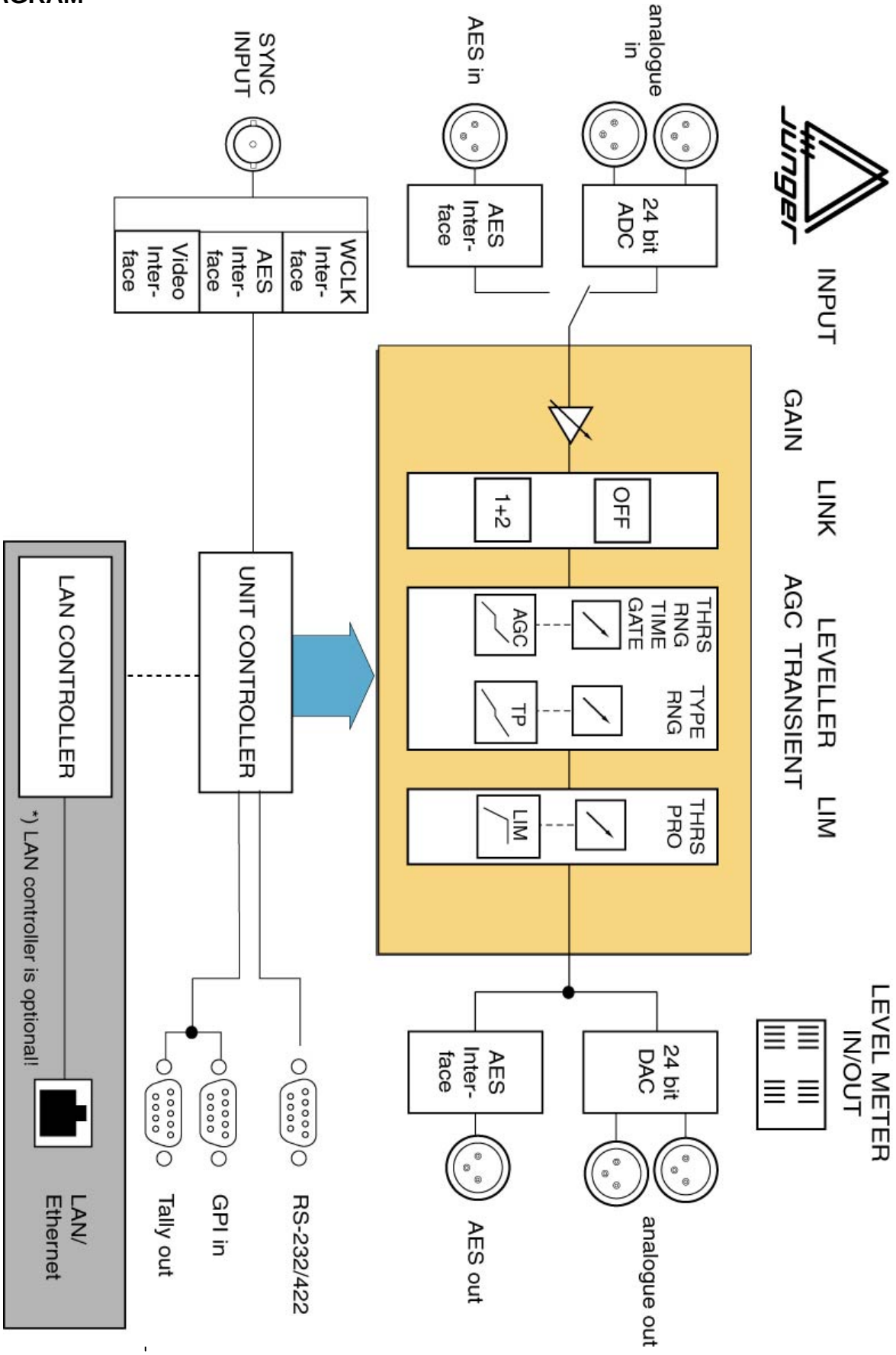
The dynamic range processor principles developed by Jünger Audio enable level managing devices like compressors, AGC and limiters to be produced with exceptionally high audio quality, without coloration, pumping, breathing, distortion or modulation effects sometimes associated with this type of processor.
In short, almost inaudible processing - with ease of use. The outstanding quality of the processing is based on the Multi-Loop dynamic range control principle in combination with adaptive controlled processing algorithms developed by Jünger Audio.

The unit is easy to operate and requires only a limited number of settings to be made by the user to achieve optimum results. All other parameters necessary for inaudible processing are continuously automatically controlled in response to changes in the programme signal.

features

- 2-channel digital audio levelling processor
- various link modes: stereo 1/2 or ch1 and ch2 independent
- adjustable input gain (channel independent) -20...+20 dB
- adaptive controlled audio levelling processing
  - Leveler, Transient Processor, Limiter
- user friendly preset and recall function (10 presets)
- extern sync mode, AES/EBU, WCLK or VIDEO
- RS-232/422 interface for serial remote
- GPI interface for parallel remote control, tally output
- operation via web interface (LAN)
- optional operation via front panel

2.2 BLOCK DIAGRAM



2.3 AUDIO SIGNAL PROCESSING

All signal processing is done in the digital domain by Texas Instruments floating point signal processors. The use of 32 bit word length for calculation ensures that there is no deterioration in signal quality, even if an audio signal with a maximum word length of 24 bit is input into the processing of the unit.

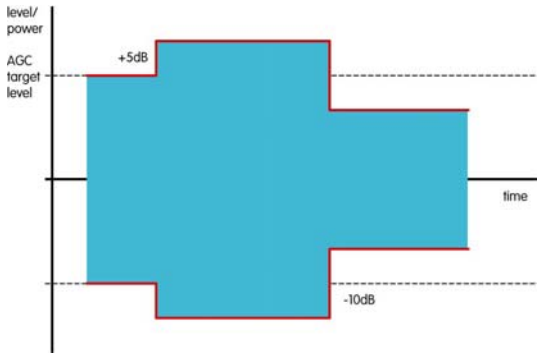
2.3.1 GAIN

GAIN means linear amplification of input signals. The input gain can be changed in steps of 0.1 dB , within a range from -20...+20 dB for both channels.

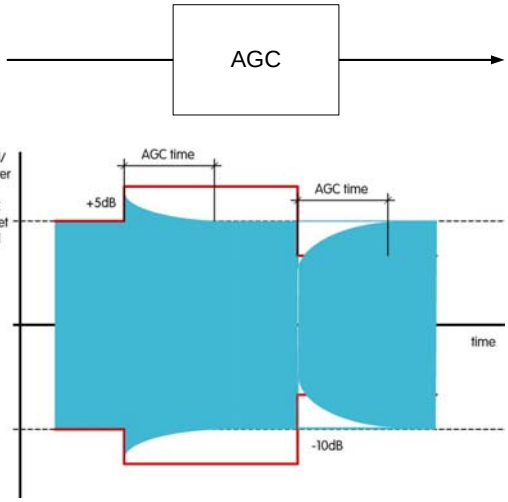
2.3.2 AUDIO LEVELLER LEVEL MAGIC™

Level Magic ™ is a unique algorithm to make automated audio levelling possible.

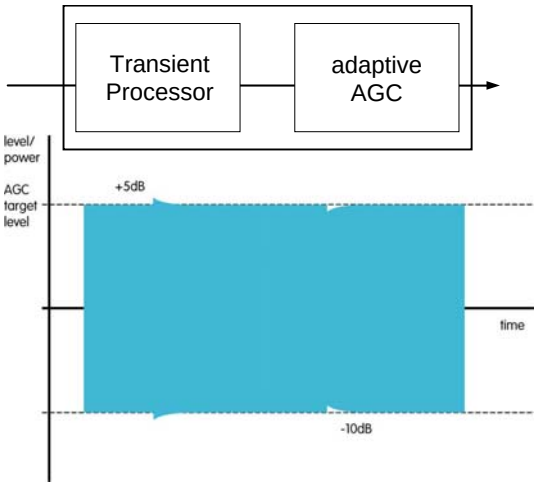
Input level change
Pic. 2 is showing a theoretical level change of +5dB and –5dB around program level.



Working with AGC
In pic.3 a conventional AGC is used to adjust the level. As we can see the AGC needs a certain time to react, that is necessary for mostly inaudible gain correction. But that's too long to get a proper correction of the input level change.



Level Magic ™
Level Magic ™ is a unique combination of a transient processor and an adaptive AGC process. The transient processor can fill the lack of level control against the slow acting AGC. The total gain of Level Magic ™ is the addition of the gain by the transient processor and the gain of the AGC.



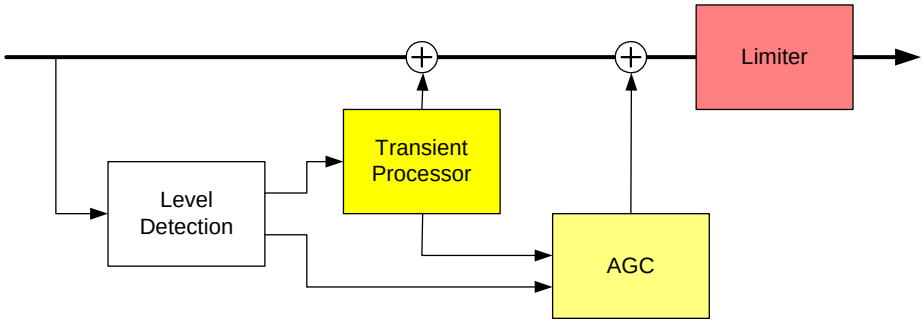
Adjustment procedure

The Level Magic ™ process needs to be setup in three steps

- select one of the default presets for your apllication (see preset description in chapter 5)
- adjust the operation level and peak level referring to standards that are used for your application
- if the default preset is not giving satisfying results change the parameters indivdually

Process description

Level Magic ™ is using a unique combination of QP and RMS level detectors to analyze the incoming audio signal. By comparing QP and RMS measurement results we can find out how much transients are coming in. Dependent on that the necessary resulting gain is controlled in relation between transient processor and AGC.



Transient processor is doing fast gain change and the AGC is doing slow gain change (depending on settings). The way how Level Magic is acting on the audio is mostly determined by balancing between slow and fast gain changing process. The AGC should be set in a way that the gain change is mostly inaudible (1dB per 5 seconds or slower). The Transient Processor should be set that incoming level jumps are reduced but originally dynamic range is not changed too much. As more possible gain by the Transient processor (RANGE), as more reduction of the dynamic range will be.

SOFT level control:	AGC	range …15dB, time >=2min
	Transient	range …4dB, soft process
MID level control:	AGC	range …12dB, time >=1min
	Transient	range …6-8dB, mid process
HARD level control:	AGC	range …10dB, time >=40sec
	Transient	range …10dB, hard process

Parameter description

Parameter description:

AGC

OP-level	operation level, target level for the AGC and for the Transient Processor
Range	max. gain by the AGC
Time	time to reach the max. gain change
Gate	threshold level where the AGC stops gain change and moves gain slowly to the long term average gain

Transient Processor

Process	a combination of level ratio and release characteristic for the fast gain change (soft, mid, hard)
Range	max. level change by the Transient Processor

2.3.3 LIMITER

The static characteristics of the d06 limiter usually refers to a digital output level of 0 dBFS (dB Full Scale). This is useful for most applications of the dynamics processor as the on-following digital recording system is supposed to be balanced down to the final bit.
For applications using headroom the output level can be adjusted within **0 ... -20 dBFS** in steps of 0.1 dB. The limiter threshold determines the maximum output level.
The static characteristic for the limiter at a limiter threshold of -12dBFS is illustrated in fig. 6.

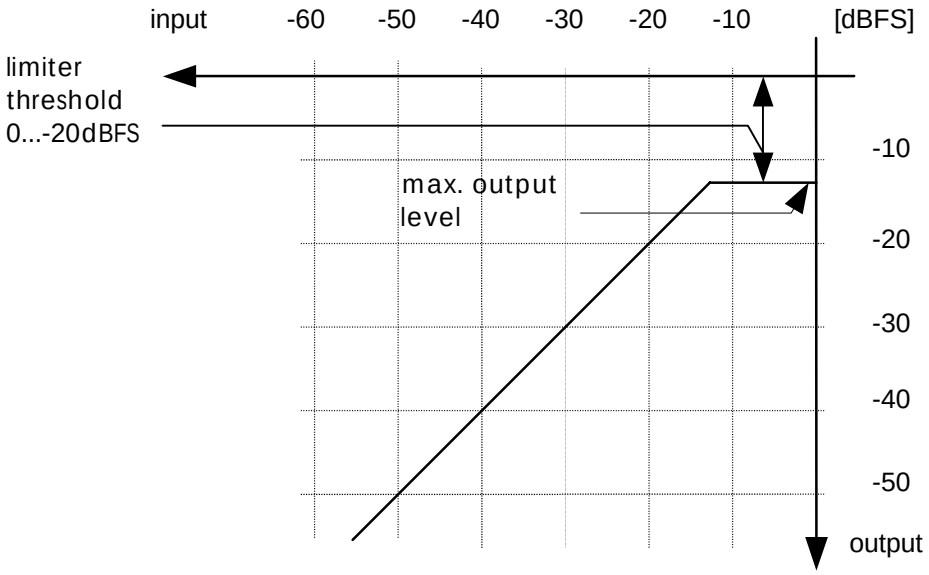


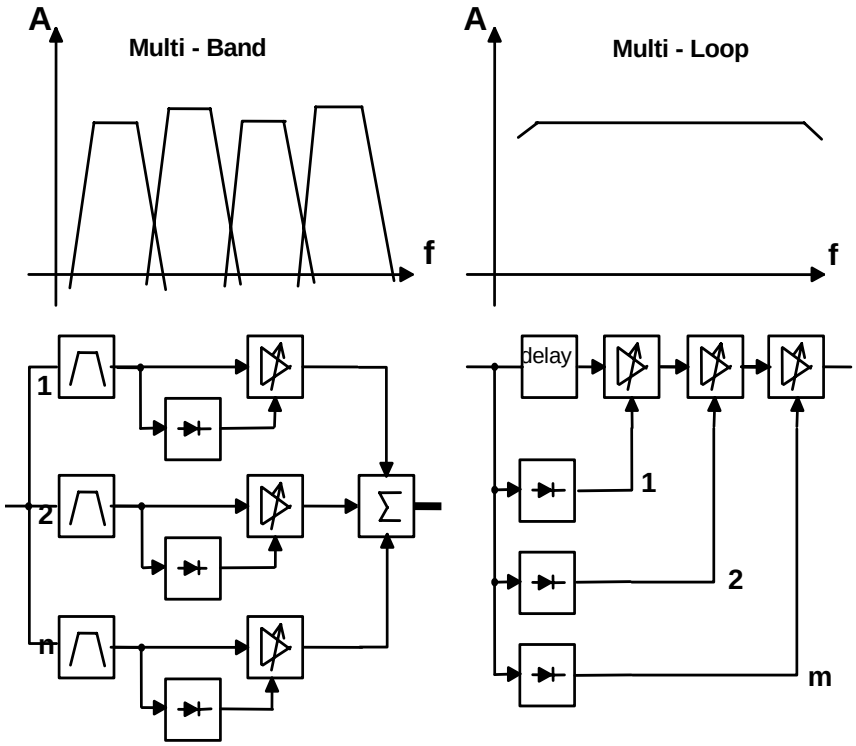
fig. 6:
basic function: limiter

For the dynamics functions a **signal delay** of approx. 2 ms is built in. This delay makes it possible to arrange the algorithm of the limiter in such a way that the control mechanism is activated before maximum level is reached (look ahead limiter). Within the rise time of the signal the peak level is recognised and the maximum is calculated in such a way that limiter threshold level is reached precisely without causing clipping.

2.4 THE JUNGER AUDIO DYNAMICS PROCESSOR PRINCIPLE

A change in the dynamic range of an audio signal is a non-linear process. The gain of a dynamic range processor is not constant as it is with the gain of a linear amplifier. The gain varies in time depending on the input signal and depending on the specific control algorithm of the dynamics processor. These variations in the gain, which represent the real control process, should take place without any bothersome side effects.
The dynamic range processor principle developed by Jünger Audio makes it possible to realize dynamics processors (compressor, limiter, expander) with very high audio quality, without signal discoloration, pumping or breathing, without distortion and modulation products - in short, with almost inaudible processing - and they are very easy to use.

The Junger Audio dynamics processors work according to a **Multi-loop** principle, operating with an interaction between several frequency linear control circuits. This is quite different to the popular multiband structure which changes the sound.



The resulting attack and release times of the **Multi-loop** system are variable and adapted to the evolution of the input signal. This allows relatively long attack times during steady-state signal conditions but also very short attack times when there are impulsive input transients.
The Multi-loop structure also permits a short **time delay** between the control circuit and the gain changing element. The gain control circuit has time to preview the signal and become active before it reaches the output. This is particularly important for the limiter, which provides a precisely leveled output signal absolutely free of overshoots (clipping).

2.4.1 PROGRAM

For some of the control parameter it is possible to define a limited range of time constant values which are allowed for the adaptive dynamic range algorithms. Inside this range the time constants can be varied by the adaptive processing. Setting the range of time constant values may be sometimes useful, to get the best signal processing performance regarding specific programme material.

Parameter related to the transient response of the control circuit are important for distortionfree processing. These time constants are allways adaptive controlled without remarkable limitation of parameter range. This is caused by the presence of transient pulses in allmost each kind of programme material. The algorithm has to guarantee best reaction for fast increasing level of transient signals anytime even if classical music with slow dying out characteristic is processed. In all cases the attack time of the limiter for very short transients is zero.

Especially the release time of the control circuit has more influence to the increase of loudness as any other parameter. The ranging of time constants in processing time groups reflects this fact. The range for processing time shows influence on release time parameter mostly.
The selection of the parameter limiter PROCESS changes the range of time constant values as follows:

PRO	processing time		
0	2 ms	to	0.2 sec
1	5 ms	to	0.5 sec
2	10 ms	to	0.8 sec
3	15 ms	to	1.2 sec
4	30 ms	to	2.5 sec
5	50 ms	to	3.5 sec
6	70 ms	to	5.0 sec
7	100 ms	to	6.0 sec
8	150 ms	to	8.0 sec
9	250 ms	to	10.0 sec

2.4.2 INFLUENCE OF SIGNAL DELAY TIME

The audio signal delay through the dynamics processor is approx. 2ms due to delaying of the audio signal using internal memory. A small delay is deliberately introduced to the audio signal in order to allow limiter and compressor algorithms which can 'preview' the audio signal before changing it. That is the signal curve can be changed before maximum level is reached. This delay must be considered before attempting to mix signals processed by the dynamics processor with other undelayed signals.
When mixing together a delayed signal and a direct signal there may be cancellation of the signal waveform at some frequencies and re-inforcement of the waveform at other frequencies (comb filter effect). Corresponding 2ms delay of direct signals should therefore be carried out before mixing them with delayed processed signals.

INSTALLATION

3

3.1 UNPACK THE UNIT

The digital audio level processor d06 was packed carefully in the factory and the packaging is designed to protect the equipment from rough handling. Please examine carefully the packaging and its contents for any signs of physical damage, which may have occured in transit.

3.2 POWER SUPPLY

The digital audio level processor d06 is a device under the safety category *Schutzklasse 1* in keeping with the VDE 0804 standards and may only used with power supply installations built according to regulations.
Check the voltage details printed at the rear panel are the same as your local mains electricity supply.

3.3 CONNECTIONS

The digital audio level processor d06 is equipped with standard connectors (see also chapter 3).
Before connecting the digital audio level processor d06 switch the power off at all connected units.

3.4 RACK MOUNTING

The digital audio level processor d06 is made as standard 19“ unit (EIA format). It occupies 1 RU (44 mm height) space in a rack. Please allow at least additional 3inch of space for the connectors on the rear panel.
When installing the unit in a 19“ rack the rear side of the unit needs some support, especially for mounting in flight cases.

3.5 OPERATION SAFETY

The digital audio level processor d06 should not be installed near units which produce strong magnetic fields or extreme heat. Do not install the audio processor directly above or below power amplifiers.
If, during operation, the sound is interrupted or displays no longer illuminate, or if abnormal odor or smoke is detected immediately disconnect the power cord plug and contact your dealer or Junger Audio.

3.6 SYNCHRONIZING THE DIGITAL OUTPUT

The digital audio level processor d06 has a digital signal output. For the problem-free combination of following digital devices, the digital signal processing can be locked to an external clock reference. The selection of the corresponding sync source is made in the SYNC MODE menu during setup. If the chosen sync input is connected with the sync signal, this signal is used for synchronization automatically. All sync sources can be used for locking A/D-converters at the analogue inputs as well. The digital output signal can be clocked with the following clock frequencies:

INTERNAL locks both the A/D-converters and the digital output with the internal reference 44,1 or 48 kHz. Digital inputs are connected via sample rate converter

AES INPUT locks with the clock frequency of the input signal at digital input CH 1/2 (AES/EBU, 44,1...48 kHz)

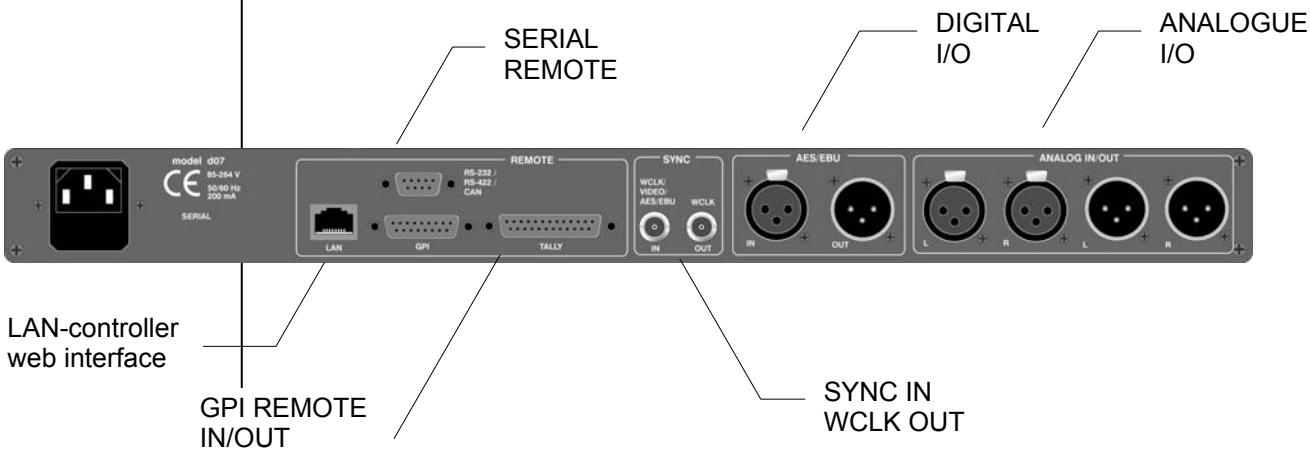
EXT AES locks with the AES signal at the sync input (AES, 44,1...48 kHz) Digital inputs are connected via sample rate converter

EXT WCLK locks with the word clock signal at the sync input (WCLK, 44,1...48 kHz) Digital inputs are connected via sample rate converter

EXT VIDEO locks with black burst at sync input (internal 48 kHz) Digital inputs are connected via sample rate converter

3.7 REAR PANEL CONNECTORS

Important Note! Video Sync is an option for the d06. For the very rare case that you can not synchronize the d06 to AES, you may buy such option from Junger Audio. Pls contact your local dealer for details.



POWER INPUT
IEC mains input connector 85-264V, 50/60 Hz with integrated fuse

REMOTE
serial remote interface RS-422 (232)
connector: 9pin SUB-D, female

GPI
parallel remote interface
TALLY-out open relay contact
connector: 25pin SUB-D, female
GPI-in optical coupler +3,5…+30V
connector: 15pin SUB-D, female

SYNC

SYNC IN	input for ext. sync signals : AES 3 format, 75 Ohm, unbalanced video sync (black burst), 75Ohm, unbalanced word clock (TTL level), 75Ohm, unbalanced
Connector :	BNC socket
WCLK OUT	output for word clock (system clock of d06) (TTL level), 75Ohm
Connector :	BNC socket

DIGITAL IN

AES/EBU	standard format
Connector :	XLR female

DIGITAL OUT

AES/EBU	standard format
Connector :	XLR male

ANALOG IN/OUT

Analog input	24bit A/D-converter floating, balanced
Connector :	XLR female
Analog output :	24 bit D/A-converter Floating, balanced
Connector :	XLR male

3.7.1 AUDIO CONNECTIONS

The analogue audio inputs are RFI filtered. Analog I/Os are balanced and floating like transformer coupled devices. All the audio connectors are via rear panel mounted connectors. Standard XLR connectors are used. These are always wired to the AES standard:

pin 1	X	Shield	
pin 2	L	Live	audio 0°
pin 3	R	Return	audio 180°.

Balanced connections are preferred whenever the other equipment provides balanced inputs/outputs. All line level connections should be wired with twin shielded cable for low noise and reliability. The shields of the cable should be connected at one end only. Input cable shielding therefore needs to be derived from the signal source end as pin 1 is ground lifted for low frequencies at the inputs.

If the equipment that drives the digital audio level processor d06 has unbalanced outputs you must add a wire jumper to connect Pin 1 of the XLR to Pin 3.
If the equipment connected to the d06 has unbalanced inputs only, we recommend to use a balanced (i.e. 2 core shielded) cable where Pin 1 and Pin 3 are connected in the XLR plug end away from the digital audio level processor d06.

3.7.2 GPI

The digital audio level processor d06 can be remote-controlled by means of parallel GPI inputs.

Use to : * recall of PRESETs 1-4
* switch between STEREO / 2CH link mode
* selection of INPUT 2 / 1
* switching the device to BYPASS

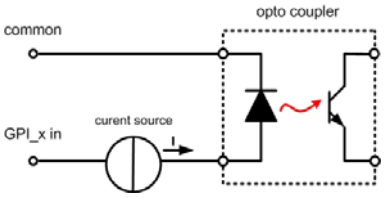
Connector : D-SUB 15pin, female

Pin assignment of the connector :

Pin	Signal name	Functions
1	GPI1 in	Defined by d06 config
2	GPI2 in	Defined by d06 config
3	GPI3 in	Defined by d06 config
4	GPI4 in	Defined by d06 config
5	GPI5 in	Defined by d06 config
6	GPI6 in	Defined by d06 config
7	GPI7 in	Defined by d06 config
8	GPI8 in	Defined by d06 config
9	+ 5V	110 Ω
10	GPI1/GPI2 common	
11	GPI3 common	
12	GPI4 common	
13	GPI5 common	
14	GPI6 common	
15	GPI7/GPI8 common	
Shield	-5V	GND of d06 Chassis

Electrical specification :

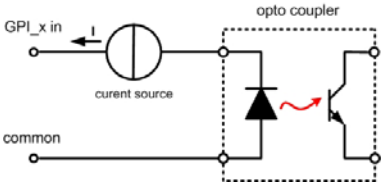
GPI input



potential free by opto-coupler in line with a current source

ON: +3.5…+30V between **GPIx** input and **GPx common**
OFF: less then 1.5V between **GPIx** input and **GPIx common**

For serial numbers **S/N 59 and higher** (HW Revision 2a and higher) the polarity of the GPI inputs has been changed. to make use of the internal ground based auxiliary 5 V for "low active" switching.



ON: -3.5…-30V between **GPIx** input and **GPx common**
OFF : less then 1.5V betwee **GPIx** input and **GPIx common**

Signal duration must be at least 50msec.

Note : An internal auxiliary voltage feed of +5V is available on pin 9 via a 110 Ω resistor. Ground is available from the shield of the connector only! When using the auxiliary voltage feed, there is no electrical isolation given anymore and the risk to inject unwanted noise is high!

Important Note : You must take care about the polarity of the external voltage applied to the GPIs. **Wrong polarity** may **destroy electronic components** and may **cause fire** inside the d06!

3.7.3 GPO (TALLY)

The digital audio level processor d06 can aknowledge specific device statuses via parallel GPO (Tally) lines.

Use to : monitor the d06 status

Connector : D-SUB 25pin
female panel jack

Pin assignment of the connector :

Pin	Signal name	Functions
1	Tally 1 normally closed	
2	Tally 1 normally opened	Defined by d06 config
3	TALLY 2 common	
4	Tally 3 normally closed	
5	Tally 3 normally opened	Defined by d06 config
6	TALLY 4 common	
7	Tally 5 normally closed	
8	Tally 5 normally opened	Defined by d06 config
9	Tally 6 common	
10	Tally 7 normally closed	
11	Tally 7 normally opened	Defined by d06 config
12	TALLY 8 common	
13	+ 5V	110 Ohm
14	TALLY 1 common	
15	Tally 2 normally closed	
16	Tally 2 normally opened	Defined by d06 config
17	TALLY 3 common	
18	Tally 4 normally closed	
19	Tally 4 normally opened	Defined by d06 config
20	TALLY 5 common	
21	Tally 6 normally closed	
22	Tally 6 normally opened	Defined by d06 config
23	TALLY 7 common	
24	Tally 8 normally closed	
25	Tally 8 normally opened	Defined by d06 config
Screen	-5V	GND of do6 chassis

Electrical specifications :

Tally output relay : common / normally closed / normally opened
24V - 1A
125V - 0,5A
P_{max} = 62,5VA

3.7.4 Serial
RS422
or
RS 232
or
CAN

The digital audio level processor d06 can be remote-controlled by means of serial remote RS-232/422.

Use : * network configuration
* administrative setup (consol interface)

Protocol : available on request

Connector : D-SUB 9pin
female panel jack

Pin assignment of the connector in serial interface mode :

Pin	Signal name	Functions
1	Rx +	RS422
2	TxD	RS232
3	RxD	RS232
4	NC	not used
5	GND	Ground
6	Rx -	RS422
7	NC	not used
8	Tx -	RS422
9	Tx +	RS422

Pin assignment in CAN-bus mode :

Pin	Signal name	Functions
1	NC	Not used
2	CAN-l	CAN-bus low signal
3	NC	Not used
4	NC	Not used
5	GND	Ground
6	GND	Ground
7	CAN-H	CAN-bus high signal
8	NC	Not used
9	NC	Not used

This connector has multiple functions which may be internally changed by connectors and jumpers (see 3.8). The factory default format setting is RS232 and it is connected with the serial interface of the LAN Controller.
By using a terminal program (115kB/sec. 8,N,1 no flow control) you may communicate with the consol of the LAN Controller, e.g. to change the IP configuration of the device.

3.7.5 LAN (Ethernet)

Connector : RJ 45 with status LEDs
8 pin panel jack

Pin assignment of the connector :

Pin	Signal name	Functions
1	TX +	Ethernet send
2	TX -	Ethernet send
3	RX +	Ethernet receive
4		
5		
6	RX -	Ethernet receive
7		
8		
9		

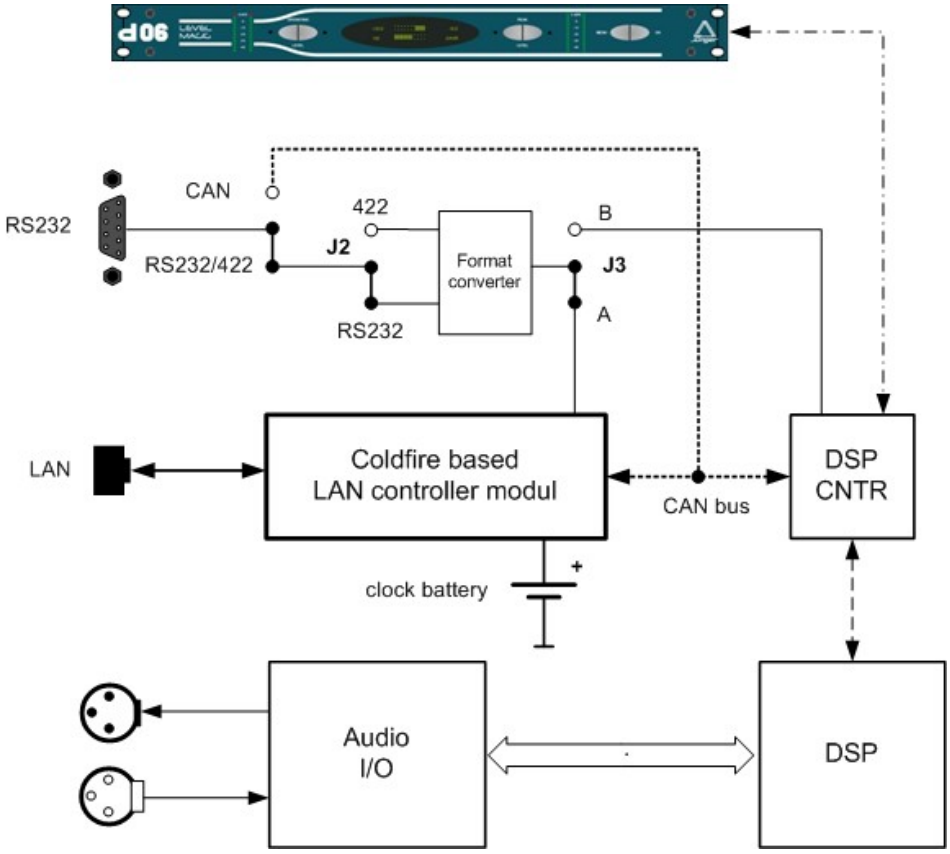
Electrical specifications : 100Mbit/s auto negotiation port

Application remarks :

This port allows remote control of the **d06** by **TCP/IP over Ethernet (web interface).** Setting up the network interface is described in chapter 4.

The LAN Controller of the d06 has a web server which offers a graphical user interface (GUI). For proper operation you need IE7 or FireFox 2.0.
You simply must use the IP address of the do6 as an URL. (see chapter 5.1 for details).

d06 control block diagram :



3.8 Switches and jumpers for configuration

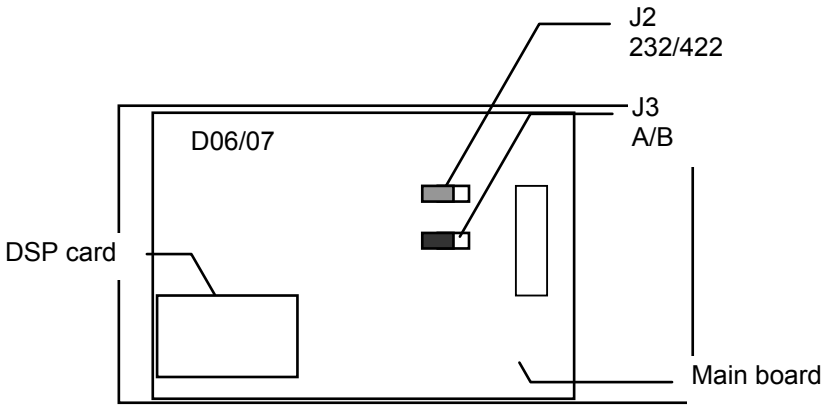
Some basic settings can be done by switches and jumpers on the PCB. These settings are general changes for operation and should be performed by qualified engineering staff only.

To set any internal jumper or switches it is necessary to open the unit.

Important Note! DO NOT CHAGE ANY SETTINGS WHILE POWER IS CONNECTED TO THE UNIT!

Loosen the screws on the top cover and remove. Then you can see all jumper and switches as shown in the schematic below. After setting of jumper or switches reassemble the unit in opposite order.

3.8.1 Selection of the serial remote interface



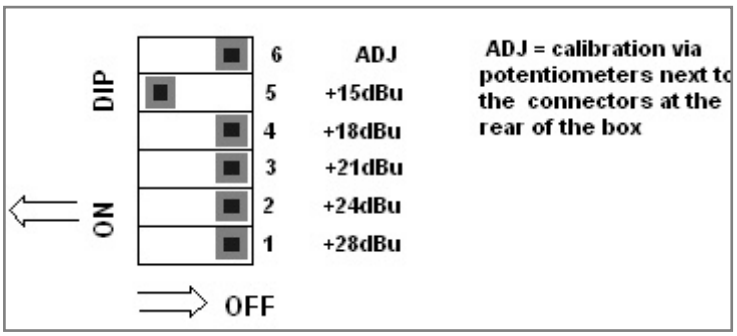
J2 : **RS-232 / RS-422** (format selection)

J3 : **A / B** serial Interface of the DSP controller (A)
or the LAN controller (B)

3.8.2 Calibration of the analog inputs and outputs

The factory default calibration of the d06 is done in reference to the German radio broadcast standard, i.e. +15dBu = 0dBFS. If you want to use a different reference standard (e.g. +24dBu = 0dBFS) you can change the setting via dip switches on the main board of the d06 :

The DIP switches are located close to the analog input and output hardware on the PCB.



For the factory setting of +15dBu=0bBFS the DIP switch "+15dBu" is turned **ON**.

To change the setting for another standard the respective DIP switch must be set to **ON** while all others must be **OFF**.

Important Note! Make sure that there is only **one** DIP switch turned **ON**!

CUSTOM Refernce Level (using Switch 6 ADJ)

If none of these stansard reference settings correspond to your needs, you may set the reference to a **CUSTOM** level by adjusting the input sensitivity via the two potentiometers (L and R) next to the analog input and output connectors at the rear of the box.

Important Note! This should only be done with measuring instruments!

Set up the reference level manually :

1. Set all dip switches to **OFF** except #**6** (ADJ) = **ON**.
2. Adjust the potentiometers to the desried CUSTOM reference level. You must feed the analog input with a known refernce level and measure the digital output.
   Important Note! Make sure that the DSP processing is bypassed, because it may add gain, that gives wrong level reading at the output!
3. When the adjustments are complete, 'freeze' the custom settings by setting DIP switch #6 to **OFF**. If not, your reference level set up may be changed by accident.

NETWORK INTEGRATION

4

To control the Junger audio devices via web browser you must set up an TCP/IP over Ethernet connection. If you are not familiar with the network setup, please consult a network administrator for assistance and read **ALL** the manual carefully!

There are two ways to communicate with the device via Ethernet:

1. You can connect the device to the **LAN** your PC is integrated (if there is one existing already)

2. You can connect the device directly to your PC using an Ethernet **crossover** cable.

In both cases network settings of the device or your PC or even both have to be changed and matched.

The default network configuration of the Jünger devices is:

IP Address : on a label at the LAN connector socket at the rear of the device
Netmask : 255.255.0.0.
Gateway : 10.110.0.1.

1. Integration into an existing LAN

When you want to integrate the device into an existing LAN you have to change its IP-address, the (sub) network mask and the gateway. You will get valid settings from your network administrator.

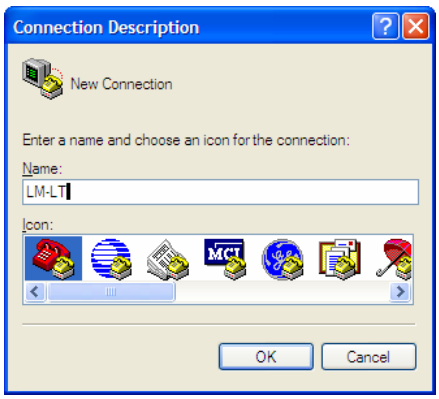
You can do that two ways :

A Connecting the device over a **serial cable** to your PC and change the network configuration with a terminal program (e.g. HyperTerminal included in Windows installation)

B Disconnect your PC from your LAN (physically), match your PC's IP setup to the setup of the device for getting access to the device via **Ethernet crossover cable**, change the device's network configuration via Ethernet crossover cable. Then change again your PC's configuration and connect both your PC and the device to the LAN.

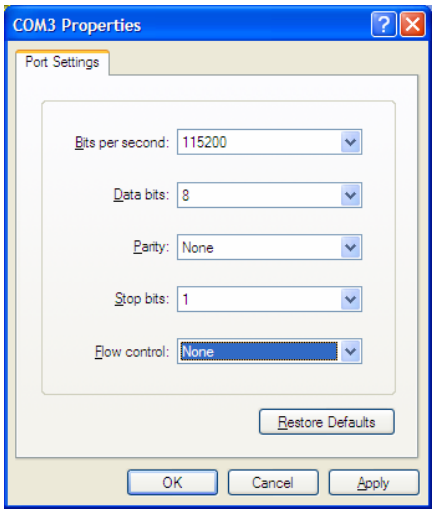
4. NETWORK INTEGRATION

A) Connect the device via a 9 pin serial cable (connected 1 to 1) to your PC. Start your terminal program (e.g. Start -> All Programs -> Accessories -> Communications -> HyperTerminal).



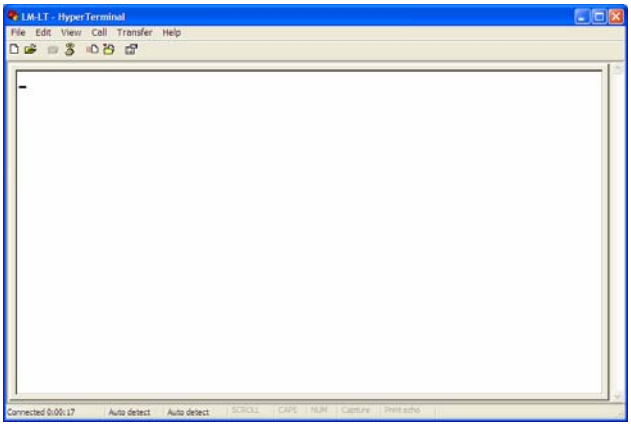
Enter a name of your choice and press OK

Choose the communication port (physical or virtual if you are using an USB > serial converter) you are working with and press OK

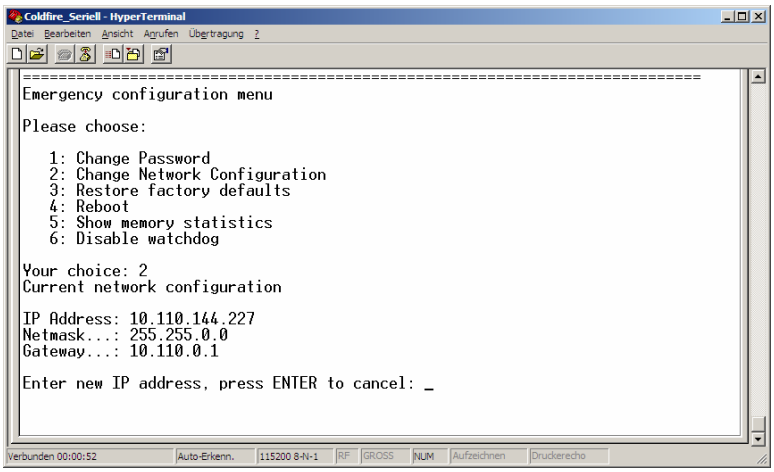


Set the port settings as they are shown in the window above and press OK.

You will get to the Hyper terminal window:



Press ENTER and you will get a similar window :



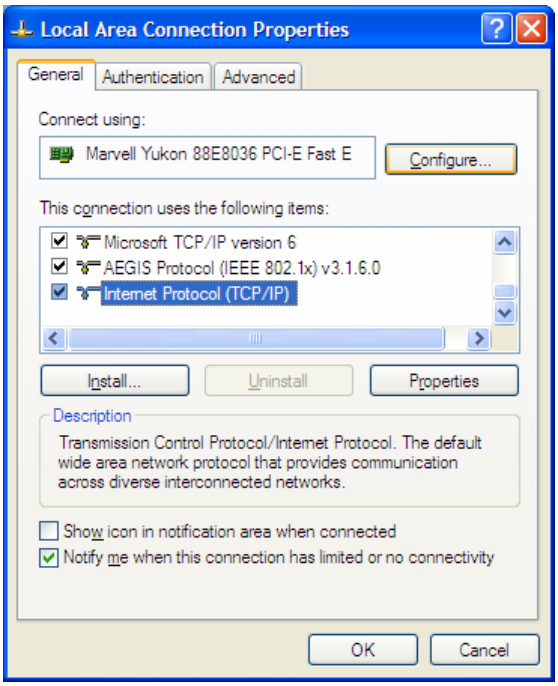
Now you can change the network configuration so that it fits into your LAN.

You might have changed the IP-address of the device, so please renew the label at the rear of the device, otherwise it will cause confusion.

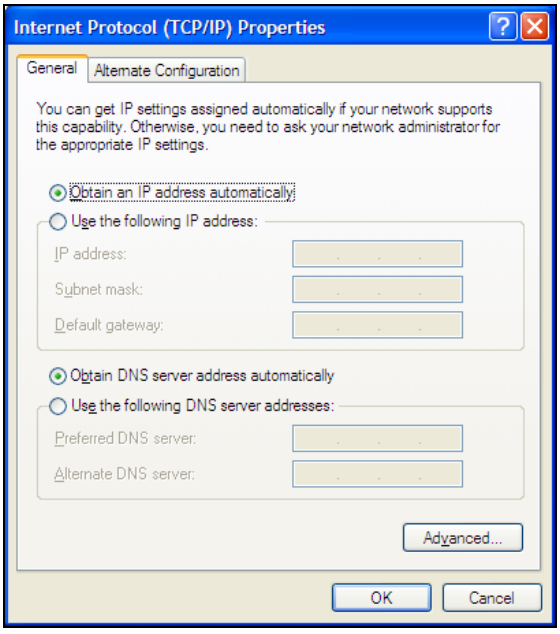
When you ever “Restore factory defaults” (i.e. initializing the device) the default IP-address and network configuration will be active again. In case of need you can read the default IP-address always on the controller in the device!

B) You can also change the IP address of the device over Ethernet connection.

Disconnect your PC from the LAN, connect it to the device directly via **Ethernet crossover cable** (not connected 1 to 1, but 1 to 8 etc…).
Change the network configuration of your PC (write down the current settings, you need them later to reconnect to your LAN!) via the “Local Area Connection Properties” menu (Windows: Start -> Control Panel -> Network connections -> Local Area Connection -> Local Area Connection Status -> Properties -> Internet Protocol (TCP/IP).



Scroll in the list and choose Internet Protocol (TCP/IP).
Make sure that the 'check box' for this item is checked, and then click on Properties.



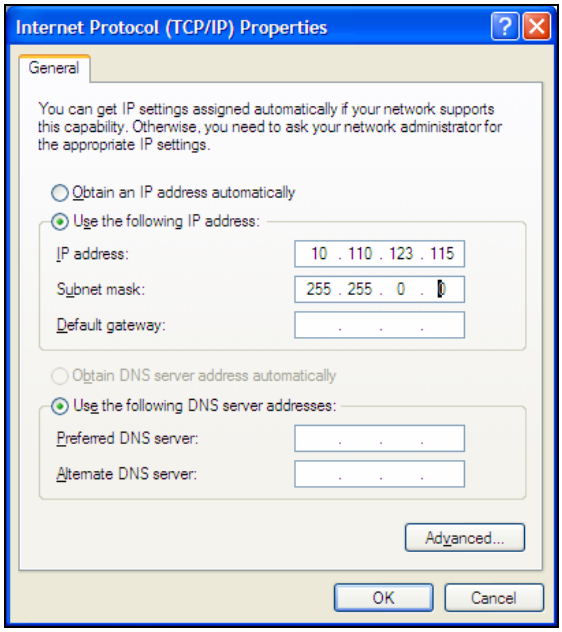
In this example, the Ethernet TCP/IP is set to 'Obtain an IP address automatically.'

If, in your case, it is set to
'Use the following IP address,'
jot down the current settings on a piece of paper
(IP address, Subnet Mask, and Default gateway, if used).
You will need them later to restore the IP address of the PC to what it is required to work on your LAN.

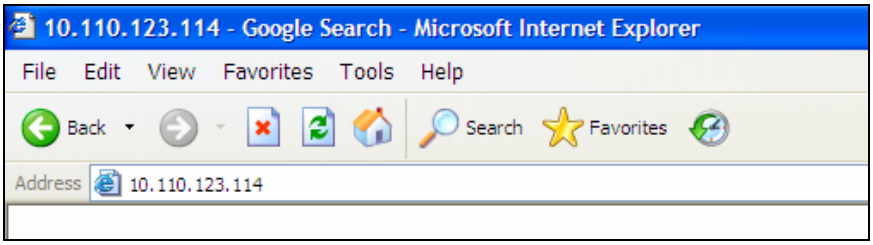
Then change the settings in order to be able to communicate with the device. You have to choose an IP-address “near” to that of the device.

So if the settings of the device are e.g.
IP Address: 10.110.123.114
Netmask: 255.255.0.0.
Gateway: 10.110.0.1.

You have to take **10.110.123.115** as IP-address (or something near to the device’s address, only 10.110.123. have to be the same!) and the same netmask. The gateway is not important when you are using an Ethernet crossover cable.



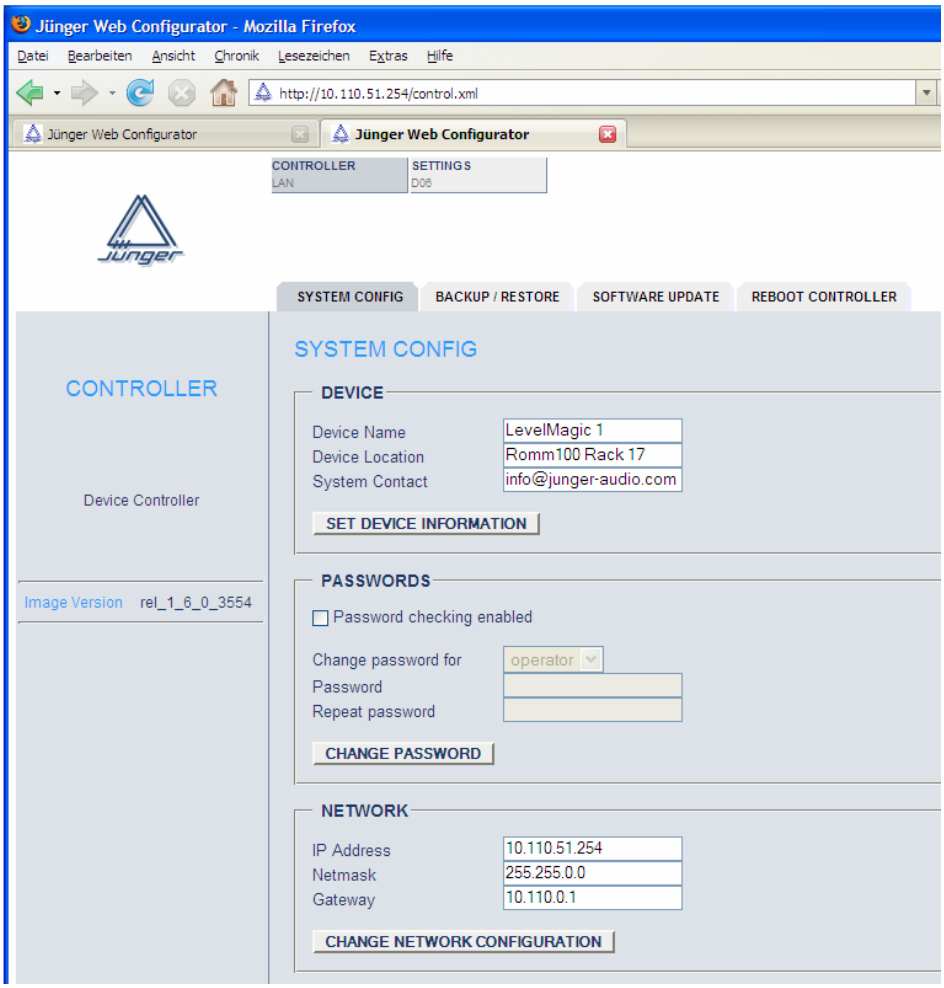
When you have changed the settings, press **OK**. Now you will be able to communicate from PC to device via web browser (e.g. internet explorer) with an Ethernet crossover cable. Just type in the device’s IP-address into your browser:



Then you will come to the modules web page:

4. NETWORK INTEGRATION

Under CONTROLLER -> SYSTEM CONFIGURATION you will be able to change the device's network configuration according to the settings of the LAN you want to use.



After having changed the settings click CHANGE NETWORK CONFIGURATION and after that REBOOT THE CONTROLLER and afterwards reboot the LAN Controller : CONTROLLER -> REBOOT CONTROLLER.

Rebooting the device activates the changes you have made to the network configuration. If you changed the IP address of the device to a different network as your PC, you may not be able to reach the web interface after the reboot.

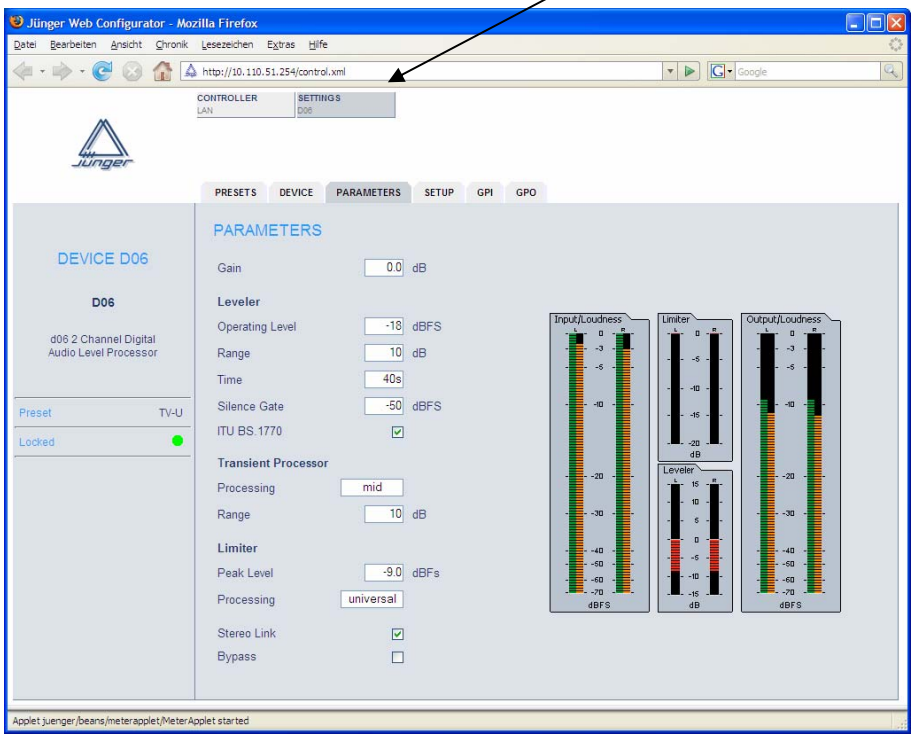
Now you have to change the settings of your PC network configuration again and connect both the PC and the device to the LAN you want to use by 1:1 Ethernet cable to a router or hub. Then you will be able to communicate with the device over web browser via the chosen IP-address.

OPERATION

GUI

5.1 GUI operation

The GUI of the d06 can be reached by connecting the d06 to a PC via LAN (either by a switch or cross over cable) and using its IP address as an URL for a web browser. Junger Audio supports both the IE7 and FireFox 2.0 and higher versions. The application assumes that there is a JAVA VM (1.6. or higher) installed on that PC in order to display level bar graphs: You must use the device IP address as an URL to connect with the d06.



PARAMETERS

This will open the **PARAMETERS** page of the GUI.
Here you must setup the dynamic operation of the d06.

5.1.1 Setting the d06 parameters

Gain : static gain to align the d06 to the level diagram of the system / installation

Leveler

Operating Level : the target level of the leveler process

Range : the range for the leveler to move gain up and down in order to match with the Operating Level

Time : the time for the leveler process to reach the maximum Range value (if needed).
The recommendation is, not to be faster than 3dB / 10sec. because this is an area where the human ear may not recognize a level change

Silence Gate : a value for the leveler process to stop gain change. This will prevent from unwanted noise if the input level drops for a longer time below it. If the signal disappears for longer time, the processing gain will move back to 0dB

ITU BS.1770 : the leveler process may be **ITU BS.1770** weighted (see ITU documentations for details). This setting applies with the ITU loudness standard. In the case ITU is enabled, the Operating Level equals to the Dolby® Dialnorm Level

Transient Processor

Processing : the **Transient Processor** is a compressor like, fast acting circuit, which deals with fast level changes. Those level changes are quite different for program genres. For a maximum fit of the process with different program types, you may change the behavior. Our recommendation is to use the “mid” setting for most programs, while “fast” is recommended for sports style (Soccer, Tennis, Golf etc.), program

Range : the range of the **Transient Processor** limits the amount of gain change. A higher value of Range will limit the dynamic of the input program

Limiter

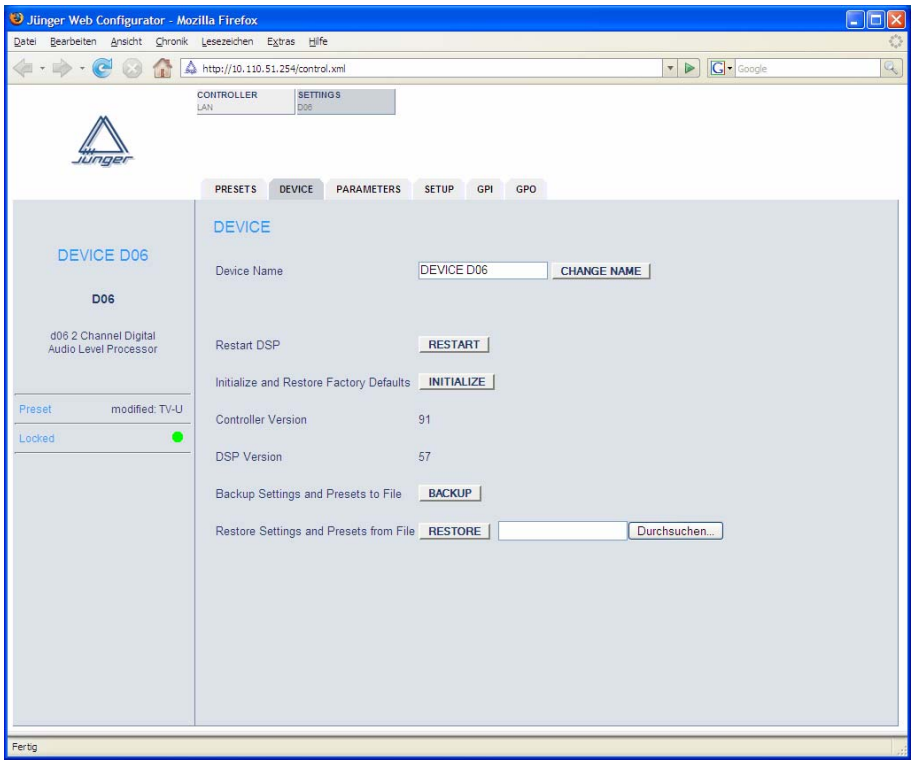
Peak Level : the Junger brick wall limiter is well known in the audio industry for its outstanding performance. Due to the fact that the algorithm will be applied on sample basis and the look ahead function, there will be newer ever an overload at the output. On top of that, this value defines the maximum output level of the d06

Processing : the algorithms are self adapting to the program. For very critical material it may be advisable to give it a good starting point, to make the limiter inaudible as possible. The recommendation is to work with the setting **UNI** which works for most of the material

5.1.2 Setup the device

As mentioned before, the d06 has a DSP controller, which also operates the front panel. You can imagine this controller as the DSP co-processor for all relevant real time communication.

DEVICE



On this page you may set up a name for the device. This name may be used in other applications.

Restart DSP : in case of a processing problem you may restart the DSP and its co-processor by pressing the <RESTART> soft button

Initialize and Restore Factory Defaults :
this function instructs the DSP controller to set all PARAMETERS, the PRESETS, the SETUP and the GPI/Os to values defined by the factory defaults

Controller Version : the firmware version of the DSP controller

DSP Version : the firmware version of the DSP program

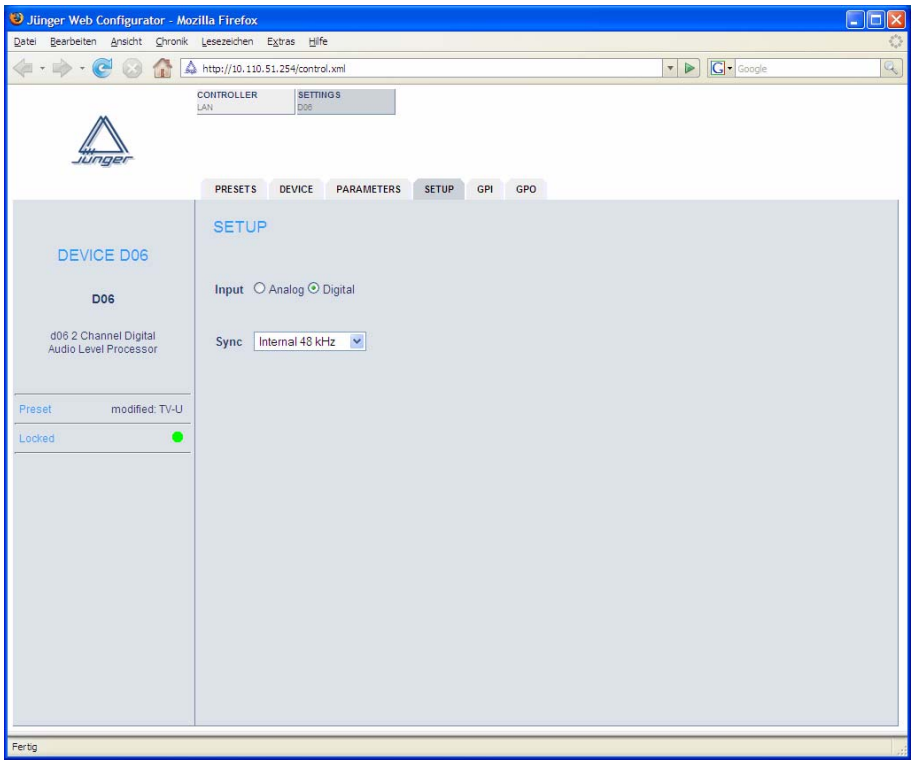
Backup Settings and Presets to File :
all relevant variables used by the DSP controller may be saved to a file for later backup or you may use it to copy such settings to an other **d06**

Restore Settings and Presets from File :
you may search for a file to restore the settings of the DSP controller and start the restore process here

5.1.3 General settings

The **d06** has analog as well as digital inputs and it features the external synchronization of the digital output to an external reference. On this page you may change such settings.

SETUP



Input : the radio buttons will switch between analog and digital (AES/EBU) input

Sync : the d06 may be synchronized to :

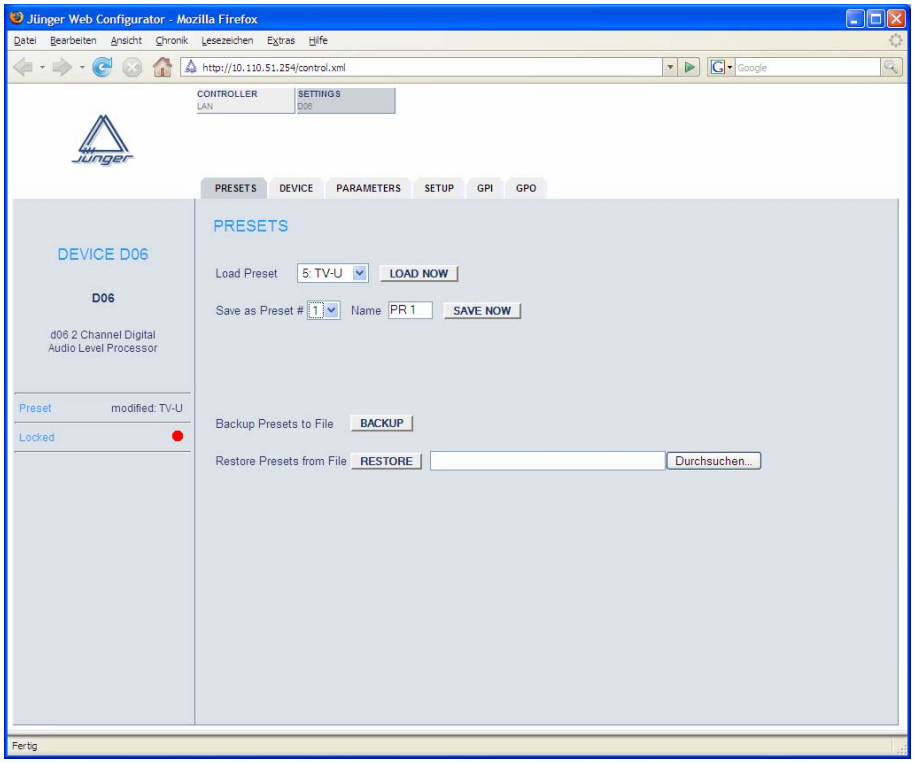
internal reference 48kHz	
internal reference 44.1kHz	
AES XLR input	
external AES	BNC rear connector
External Wordclock	BNC rear connector
Video Sync	BNC rear connector

Important Note! Video Sync is an option for the d06. For the very rare case that you can not synchronize the d06 to AES, you may buy such option from Junger Audio. Pls contact your local dealer for details.

5.1.4 Preset operation

The **d06** has 10 Presets. Those Preset may be recalled by the user at any time. Preset #5 - #10 are factory Presets while Preset #1 - #4 are user presets which may be overwritten by the user.

PRESETS



Load Preset : the drop down list offers the selection of one of the 10 Presets of the d06. Pressing the **<LOAD NOW>** soft button will load the pre selected Preset

Save as Preset # : the number displayed by the drop down list represents the memory number of the Preset (#1 - #4), where you will store

Name : You may give your Presets a digit name here

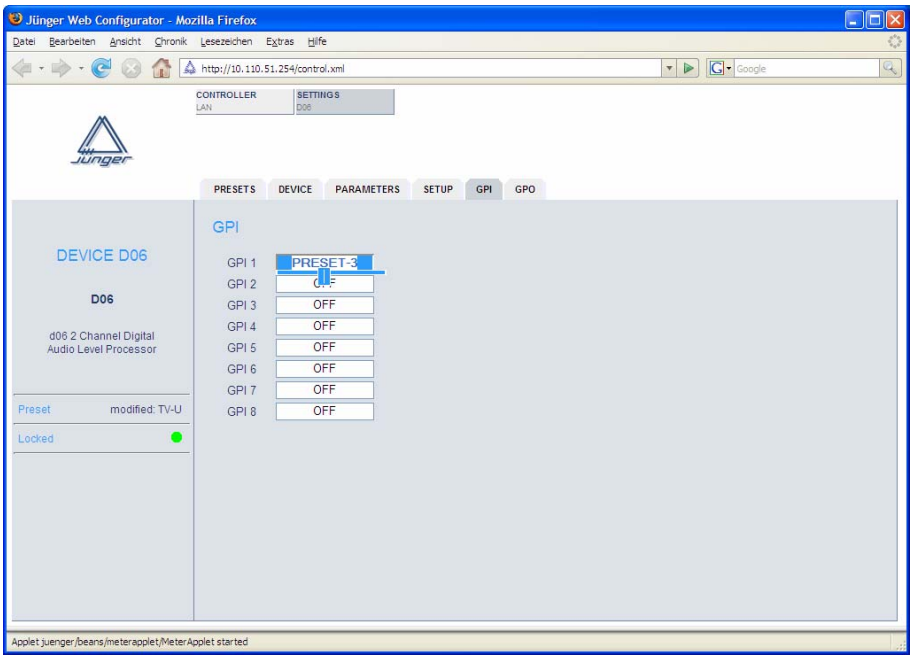
Backup : You can backup all Presets to a file

Restore Presets from File:

Here you may select a file from the PC file system to restore all Presets or to copy them to an other d06

5.1.5 GPI/O set up

GPI



GPI 1 to GPI 8 : you can assign each physical GPI input one function by moving the slider across the input field.
The options are:

- PRESET-1 to PRESTE-4 (loads assigned preset)
- STEREO (turns the link mode = On)
- DIGITAL (selects the digital input)
- BYPASS (activates the bypass relay)

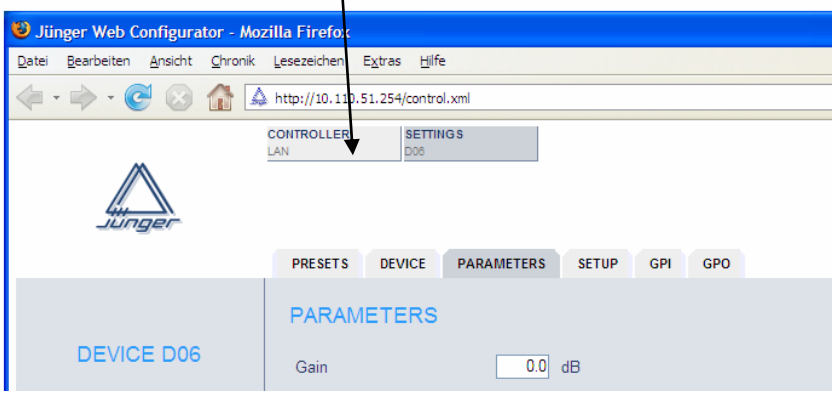
GPO

GPO 1 to GPO 8 : you can assign each physical GPO (Tally) one status by moving the slider across the input field.
The options are :

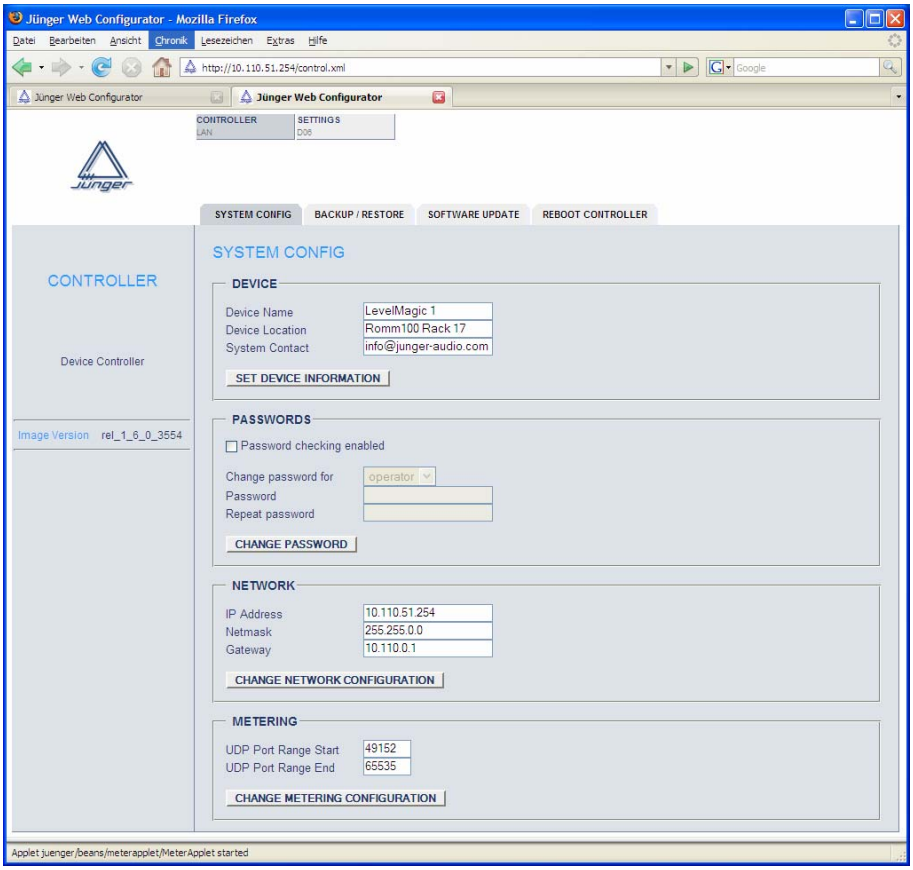
- PRESET-1 to PRESET-4 (is selected)
- STEREO (link mode is selected)
- LIMITER (activity of the limiter)
- CLIP (input signal is clipping)
- DIGITAL (input is active)
- BYPASS (relay is active)

5.1.6 LAN Controller set up

The LAN Controller of the **d06** provides its own menu. You must press the **<CONTROLLER>** soft button:



5.1.6.1 System configuration



DEVICE : you may assign the device a name string and a location string as well as a contact address. This information may be used by an external monitoring system like a SNMP manager

PASSWORDS : the do6 may be setup for password operation. If this function is turned on, one must use the passwords you may set up here. The password protected mode knows three different user levels:

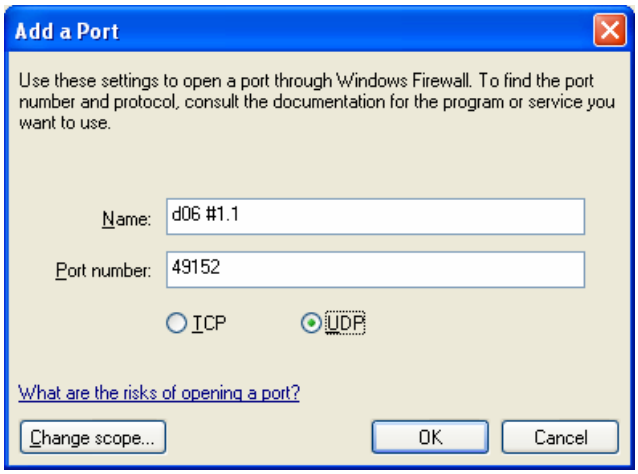
The Viewer	can only view the embedded level display
The Operator	can change presets in addition to it
The Administrator	can do everything

NETWORK : you may change the IP configuration of the device

METERING : in order to receive data for the level display, **if a local fire wall is active**, you must reserve UDP ports (for which the fire wall will held open).

To set up those **UDP ports** for local PCs, you must open the firewall settings (right click on the network symbol in the task bar of windows and select : **"Change Windows Firewall settings"**. This will open the **"General"** tab. Click on the **"Exceptions"** tab in order to open the Exception page

On the **Exceptions page** open the **“Add Port”** menu:

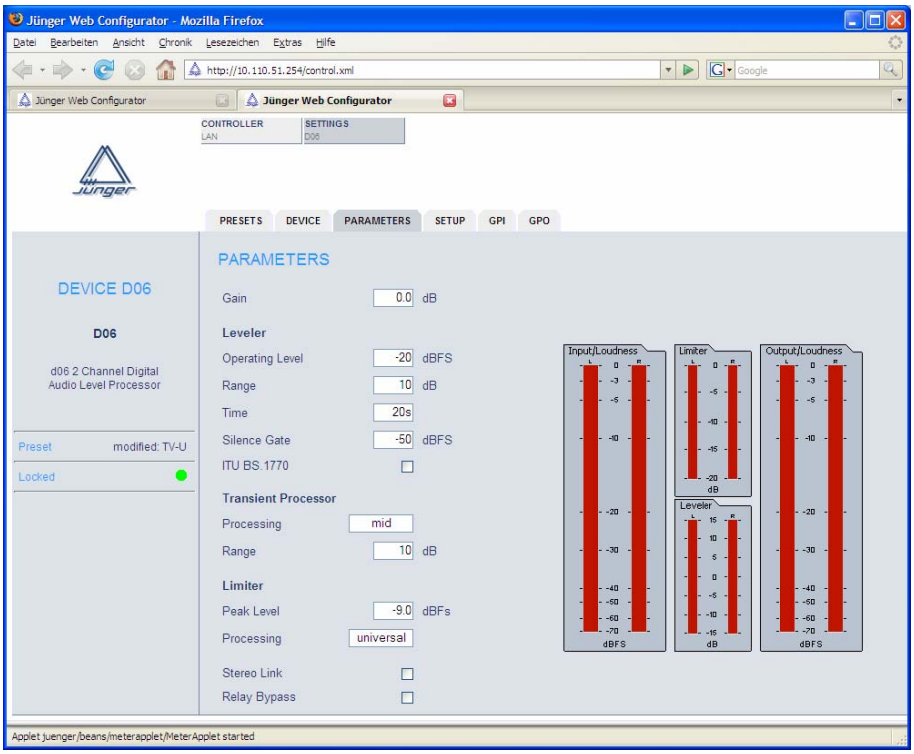


Here you must give this rule a unique name (e.g. “d06 #1.1”) and assign it a **UDP port** number from the number of **UDP Ports**, set up by:
UDP Port Range Start / UDP Port Range End (see METERING).

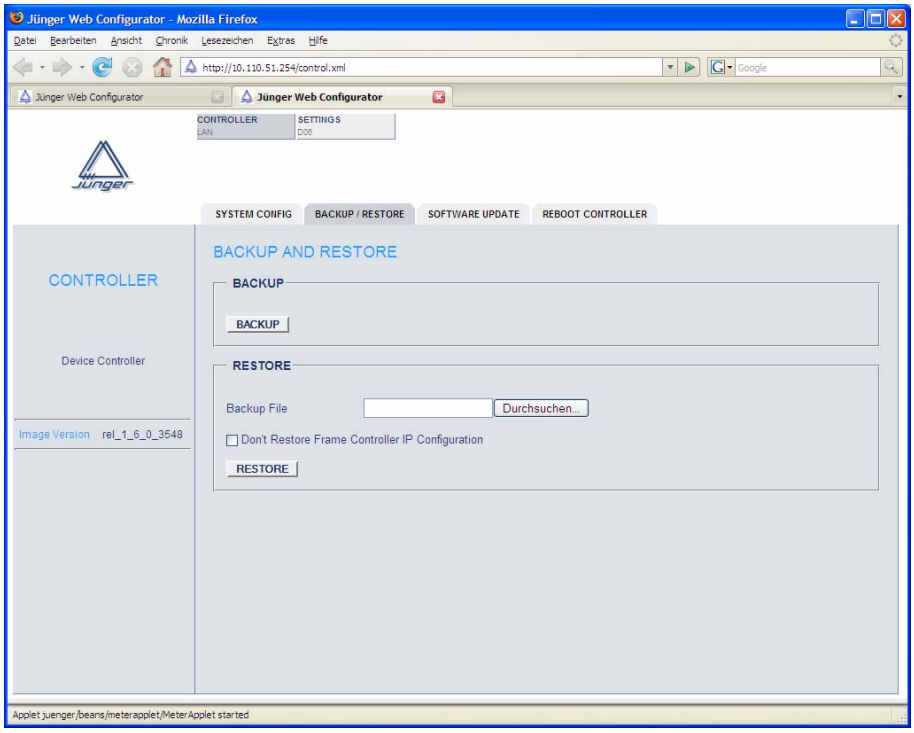
If you want to connect from different PCs with the same device, it is sufficient enough to assign one port, because different PCs will open different IP sockets because they have different IP address (but use the same UDP port number).

If you want to connect from the same PC with different devices, a unique UDP port number for every remote device is necessary!

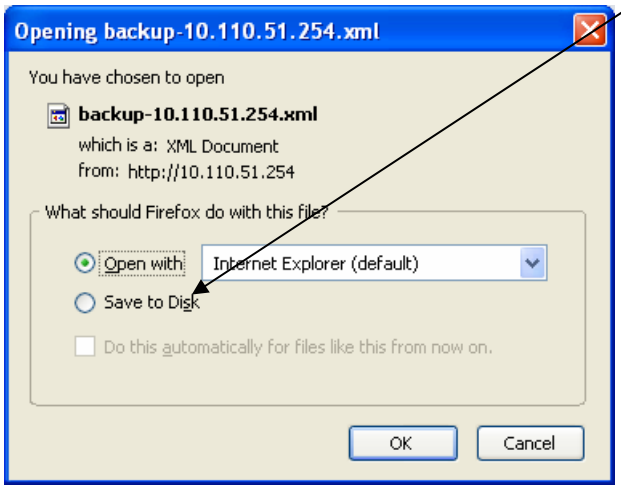
Important Note! To connect multiple browser sessions from the **same PC** with the **same device** is not implemented! In such case the next browser session will not get UDP data from that device. This will cause a red colored meter display :



5.1.6.2 Backup & restore

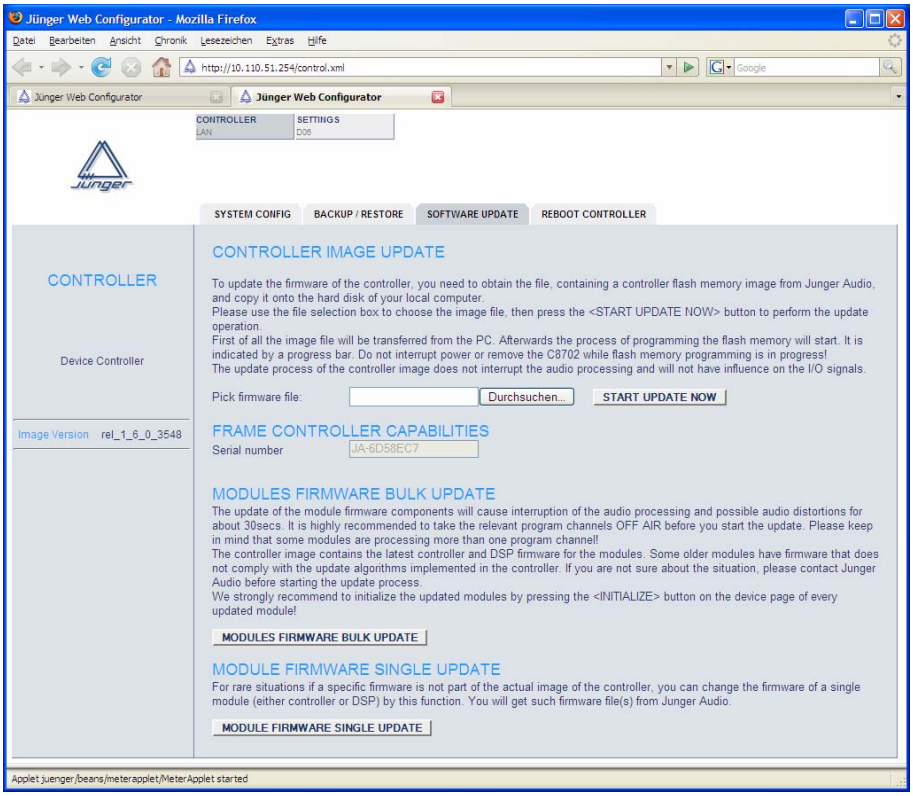


BACKUP : if you press the **<BACKUP>** soft button, the **LAN Controller** will generate an **XML** file that represents all settings of the device.
If done, you may download the file to your PC :

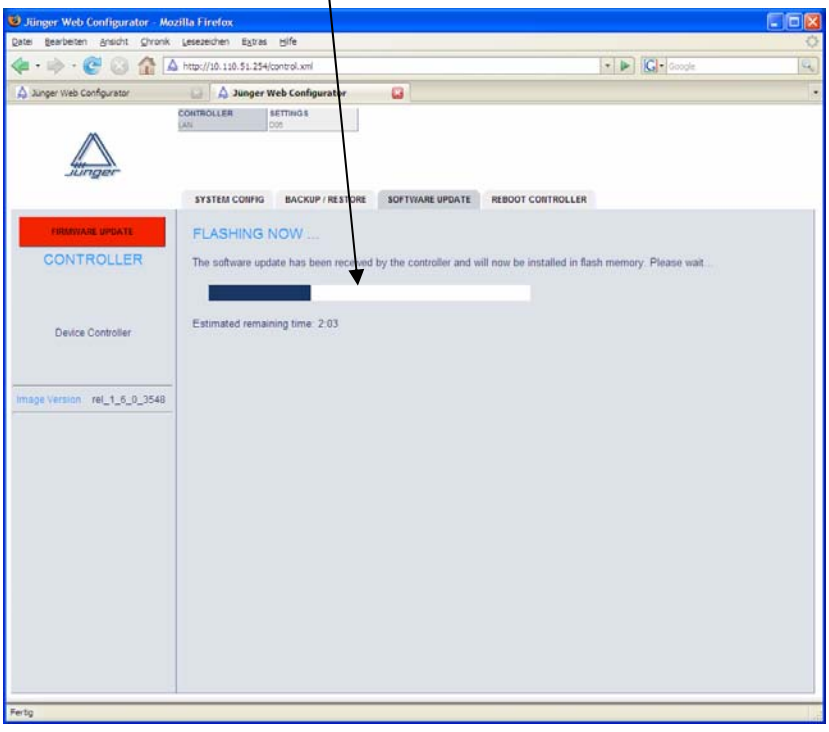


RESTORE : here you can select a backup file from the file system. The process will start when you press the **<RESTORE>** soft button.

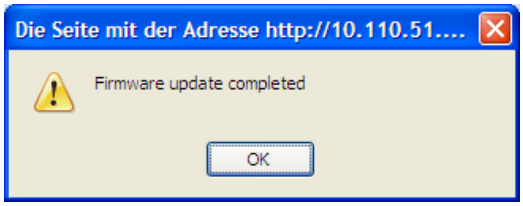
5.1.6.3 Software update



In **chapter 3** we have explained that the d06 has 3 major components : The **DSP**, the **DSP Controller** and the **LAN Controller**. To update the **LAN Controller**, you must select the firmware file (also called the image) from the local file system of your PC (you may get such file via HTTP download from Junger Audio). If you press the **<START UPDATE NOW>** soft button, the PC will upload the image file to the **LAN Controller** and will initiate the “burning” process of its FLASH memory. This will take about 5min. When the process of “burning” the flash memory starts, you will see a **progress bar**.

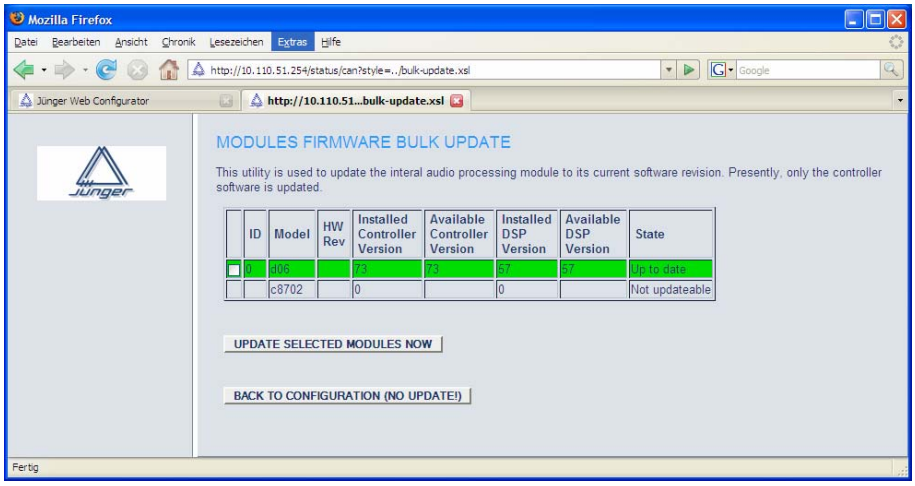


From this moment on, there is no communication with the **LAN Controller** possible. If the progress bar comes to its end, the browser will restart communication with the **LAN Controller** and you will get a message that the process has finished :



MODULE FIRMWARE BULK UPDATE

The image file also carries the actual firmware files for the **DSP** and the **DSP Controller.** This function offers you an update of both components. When you press the soft button, the LAN Controller reads the installed versions and compares it with the release version it has “on board”. You will get a display to make a choice if you want to update :



For the above example there is no update needed. (C8702 is the internal label for the LAN controller).

MODULE FIRMWARE SINGLE UPDATE

If there is the need to update one of the components by a firmware that is not “on board” of the **LAN Controller**, you may use this function. It offers you either to update the (DSP) Controller and/or the DSP. The firmware file must be provided from the file system of the PC.

REBOOT CONTROLLER

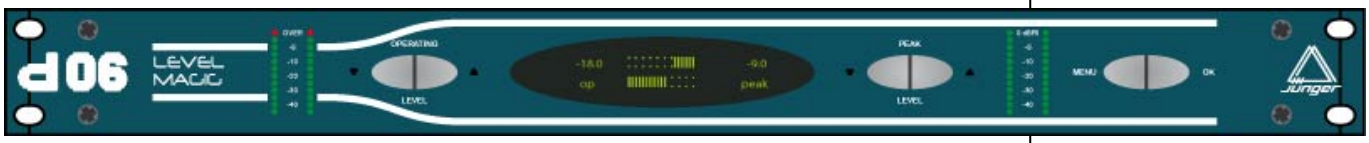
This function allows you to reboot the LAN Controller.

5.1.6.4 Reboot the LAN Controller

OPERATION

front panel

5.2
Front panel operation



Functions of the buttons :

OPERATING

▽ △

LEVEL

setup of operating level - **OL**

setup of parameter values

PEAK

▽ △

LEVEL

setup of limiter threshold **- PEAK**

selection of menu items

<MENU>

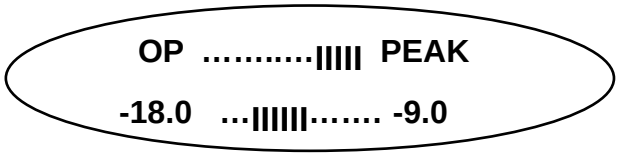
enter a menu / escape a menu

<OK>

next menu level
prompt a selection or a value
load / save a preset

5.2.1 Setting the reference levels

The picture below shows an example main display after power on:



The top display shows the current limiter gain reduction [0dB at right hand], while the bottom display shows momentary gain change introduced by the leveler process [0dB at center].

There are two **reference levels** :
OP = **Operating Level** (target level of the leveler process)
PEAK = **Peak Level** (Threshold of the brick wall limiter)
These are top level settings. They can be adjusted **without** calling the **menu** :

Simply press the respective up ▲ and down ▼ arrow buttons to change values. The range of the settings are :

OP = -40 … 0dBFS in steps of 1dBFS
PEAK = -20 … 0dBFS in steps of 0,1dBFS

- ➔ If you press the arrow button for more than 2,5 sec. the values will change automatically
- ➔ **Push the OK button to display the actual input level in numeric values**

5.2.2 Menu selection

Press **<MENU>** to enter menu selection.

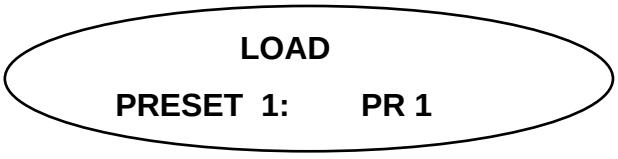
Push the **PEAK LEVEL** ▲ or ▼ buttons to navigate in either direction:

PRESET ▲ CONFIG ▲ PARAMETER ▲ PRESET

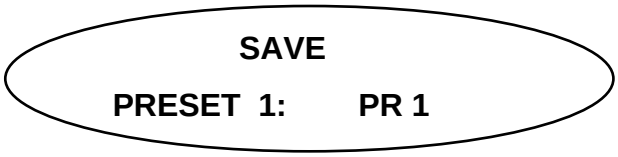
Press **<OK>** to open one of the selected menus.

5.2.3 Preset menu

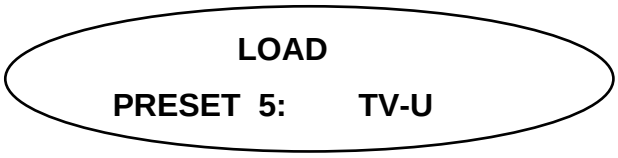
Press **<OK>** to enter the **PRESET** menu :



Push the **PEAK LEVEL** ▲ or ▼ buttons to select **LOAD** or **SAVE** :

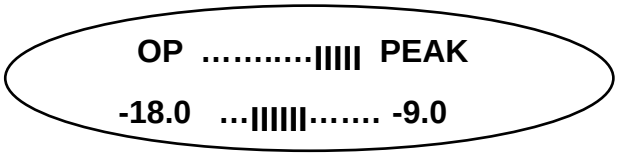


Push the **OPERATING LEVEL** ▲ or ▼ buttons to select a preset by number (example preset # 5) :



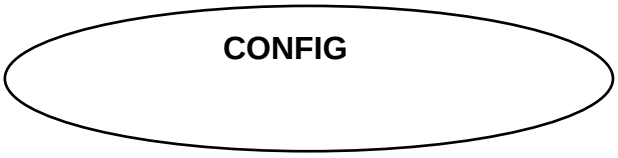
Important Note: The d06 has **10 presets** to load, while presets #1 - #4 may be overwritten by the user, Presets #5 - #10 are **factory presets** which can **not** be **overwritten**!

Press **<OK>** to **load** or **save** the selected preset and jump back to the main display or press **<MENU>** to jump back (escape) to main display without changes :

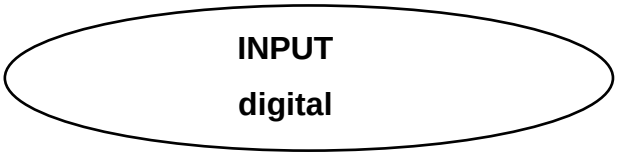


The table at the end of this chapter shows the values of the factory PRESETS.

5.2.4 Configuration menu



Press **<OK>** to enter the **CONFIG** menu :



Push the **OPERATING LEVEL** ▲ or ▼ buttons to select between : **digital** and **analog**.

Press **<OK>** to make selection and jump back to the **CONFIG** menu or press **<MENU>** to jump back (escape) to the **CONFIG** menu without changes.

The table below shows the details of the **CONFIG** menu if you push the **PEAK LEVEL** ▲ or ▼ buttons to select one of the **CONFIG** parameters.

For each **CONFIG** parameter there are several values.
If you push the **OPERATING LEVEL** ▲ or ▼ buttons you will select one of these values :

Parameter	Value	Class
INPUT	analogue digital	SETUP
SYNC	intern 48 kHz intern 44,1 KHz Input extern AES	SETUP
MODE	2-channel stereo	PRESET
LOCK	unlocked locked	SETUP
PASSWORD **There are 4 digits**	0 1 2 3 4 5 6 7 8 9	SETUP
GPI **(There are 6 physical GPIs)**	OFF PRESET1 PRESET2 PRESET3 PRESET4 STEREO INPUT2 BYPASS	SETUP

Table continues from previous page

Parameter	Value	Class
TALLY (GPO) **(There are 8 physical GPOs)**	8 Tallies : OFF PRESET1 PRESET2 PRESET3 PRESET4 STEREO LIMIT CLIP INPUT2 BYPASS	SETUP
SOFTWARE VERSION	**C:** controller firmware # **D:** DSP firmware #	Display only
CONTRAST	0 … 7	SETUP
BRIGHTNESS 1	0 … 7	SETUP

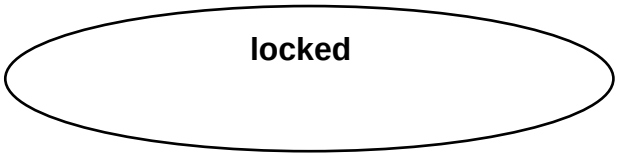
The Class column shows where such parameter belongs to, if it will be stored in a preset or not.

The **PASSWORD**, **GPI** and **TALLY** menus have a 3rd level so you must press **<OK>** again if you want to make changes there.

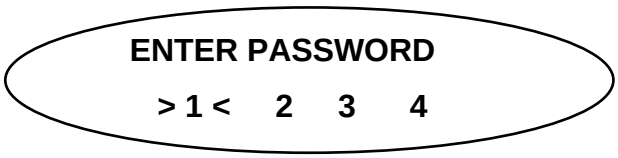
E.g. to change the password, push the **PAEK LEVEL** ▲ or ▼ buttons to move the flashing arrowheads between the four digits :

Push the **OPERATING LEVEL** ▲ or ▼ buttons to change the respective number.

If the **d06** front panel is locked to prevent from unauthorized operation, one will be notified in the main display if you push a cursor button :



You may press the **<MENU>** button now, to open the password menu :



See above how to enter the correct password. If done press **<OK>** to open the front panel operation again. It will stay open until you reach the upper menu level (main display). This will lock the front panel again.

5.2.4
Parameter menu

Press **<OK>** to enter the **PARAMETER** menu :

For each PARAMETER there are several values. You must push the **OPERATING LEVEL** ▲ or ▼ buttons to select between those values:

Parameter name :	Value	Steps	Class
GAIN	-20dB ... +20dB	0.1dB	PRESET
OPERATING LEVEL	0.0dBFS ….-40.0dBFS	1dBFS	PRESET
LEVELLER Range :	0dB ... +40dB	1dB	PRESET
LEVELLER Time :	20, 40sec. 1, 2, 5, 10, 20, 40min. 1, 2h		PRESET
LEVELLER Silence Gate:	-60dBFS ... -20dBFS	1dB	PRESET
LEVELLER ITU BS.1770:	ON OFF		PRESET
TRANSIENT PROC Processing:	soft mid hard		PRESET
TRANSIENT PROC Range:	0dB … 15dB	1dB	PRESET
PEAK LEVEL	0.0dBFS … -20.0dBFS	0.1dBFS	PRESET
PEAK LIMITER Processing:	LIVE SPEECH POP UNI CLASSIC		PRESET

The Class column shows where such parameter belongs to (if it will be stored in a preset or not).

Table of preset parameters and their values :

Preset name :	TV-U	R -U	R-SP	TV-L
Parameter name :				
GAIN	0.0dB	0.0dB	0.0dB	
OL Operating Level	-18dBFS	-9dBFS	-9dBFS	-18dBFS
LEVELLER AGC Range :	10dB	10dB	10dB	10dB
LEVELLER AGC Time :	40sec.	40sec.	20sec.	20sec.
LEVELLER AGC Silence Gate:	-50dBFS	-50dBFS	-40dBFS	-50dBFS
LEVELLER AGC ITU BS.1770:	ON	ON	ON	ON
TRANSIENT PROC Processing:	mid	mid	hard	hard
TRANSIENT PROC Range:	10dB	10dB	15dB	10dB
PEAK Limiter Threshold	-9.0dBFS	0.0dBFS	0.0dBFS	-9.0dBFS
PEAK LIMITER Processing:	UNI	UNI	SPEECH	LIVE
MODE	stereo	stereo	stereo	stereo

TECHNICAL SPECIFICATIONS

6

digital signal processing

sample rate 44.1/48 kHz
audio data format 24 bit

digital in- / outputs

DIGITAL IN/OUT

AES/EBU

connector	XLR, 110 balanced
input format	AES professional, AES consumer
output format	same as input format

channel status bits :

from digital input to digital output	transparent
from analog input to digital output	fixed channel status bits * professional * sample rate 48kHz * 2ch mode * 24 bit audio

analog in- / outputs

ANALOG IN/OUT

ANALOG IN

Resolution	24bit
sample rate	44.1 … 48kHz
dynamic range	110dB (RMS) 114dB (A-weighted)
THD+N	<0.002% @ max. input level
frequency response	20Hz...20kHz (+/-0.5dB @ SR=48kHz)
CMRR	–100dB @ 50Hz
max. input level	+28dBu @ 0dBFS
input impedance	10 kOhm, balanced, floating
connector	XLR, 1-shield, 2-live, 3-return

ANALOG OUT

Resolution	24bit
sample rate	44.1 … 48kHz
dynamic range	108dB (RMS) 110dB (A-weighted)
THD+N	<0.002% @ max output level
frequency response	20Hz...20kHz (+/-0.5dB @ SR=48kHz)
max. output level	+28dBu @ 0dBFS
output impedance	30 Ohm, balanced, floating
connector	XLR, 1-shiled, 2-live, 3-return

5. TECHNICAL SPECIFICATIONS

sync in- / outputs

SYNC IN

WCLK	connector	BNC, 75Ohm, coaxial
	level	TTL-level
	input format	Wordclock
AES/EBU	connector	BNC, 75 Ohm, coaxial
	level	0,5 ... 5 Vpp
	input format	AES professional, AES consumer
VIDEO	connector	BNC, 75 Ohm, coaxial
	level	0...1 Vpp
	input format	Blackburst or PAL/NTSC composite video

WCLK OUT

WCLK	connector	BNC, 10kOhm, coaxial
	level	TTL-level
	output format	Wordclock

remote control

REMOTE

serial remote interface	RS-232
connector	9 pin SUB-D female
serial remote interface	RS-422
connector	9 pin SUB-D female
serial remote interface	CAN (1.0)
GPI parallel remote	
level	opto coupler, 3 … 24V control voltage
connector	15 pin SUB-D female
Tally Out	
level	relais contact
connector	25 pin SUB-D female

general

power consumption	appr. 15 VA
dimensions	19“, 1 RU, 250 mm depth
weight	appr. 5 kg

WARRANTY AND SERVICE INFORMATION

7

JÜNGER AUDIO grants a two-year warranty on the

2-channel digital audio level processor d06

If the unit has to be serviced, please send it, ideally in the original box, to:

JÜNGER AUDIO - Studiotechnik GmbH

Justus-von-Liebig-Str. 7

D - 12489 Berlin
GERMANY

Tel.: +49 - 30 – 677721 - 0
Fax.: +49 - 30 – 677721 - 46

KONFORMITÄTSERKLÄRUNG
DECLARATION OF CONFORMITY

Geräteart : **Digitaler Dynamikprozessor**
Type of equipment : **Digital dynamics processor**

Produkt / Product : **d06**

Das bezeichnete Produkt stimmt mit den Vorschriften folgender EU-Richtlinie(n) überein:
The aforementioned product complies with the following Europaen Council Directive(s):

89/336/EWG (geändert durch 91/263/EWG und 92/31/EWG)
(changed by 91/263/EEC and 92/31/EEC)
Richtlinie der Rates zur Angleichung der Rechtsvorschriften der Mitgliedsstaaten über die elektromagnetische Verträglichkeit
Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility

73/23/EWG (geändert durch 93/68/EWG)
(changed by 93/68/EEC)
Richtlinie des Rates vom 19. Februar 1973 betreffend elektrische Betriebsmittel zur Verwendung innerhalb bestimmter Spannungsgrenzen
Council Directive of February 19th 1973 concerning electircal equipment for operation within certain voltage limits

Zur vollständigen Einhaltung dieser Richtlinie(n) wurden folgende Normen herangezogen:
To fully comply with this(these) Directive(s), the following standards have been used:

EN 55022 : 1987
EN 50082-1 : 1993
EN 60065 : 2002

Dieser Erklärung liegen zugrunde : Prüfbericht(e) des EMV-Prüflabors
Interne Vorschriften zur Sicherheits-Prüfung
This certification is based on : Test report(s) generated by EMC-test laboratory
Internal regulations for safety check

MEB Messelektronik Berlin : Kalibrier- und Prüflabor
accredited EMC laboratory

Aussteller / Holder of certificate : Jünger Audio Studiotechnik GmbH
Justus-von-Liebig-Strasse 7
D - 12489 Berlin

Berlin, 18.03.2003 .....
(Ort/Place) (Datum/Date) (Herbert Jünger, Geschäftsführer/Managing Director)

professional audio products

digital dynamics processors	d02, acccent2
digital filter processor	e07
surround dynamics	multichannel digital dynamics processor ORION
Level Magic (TM) audio level processors	d06, b46
4channel processors b40series	digital audio toolbox b40 digital audio limiter b41 digital dynamics processor b42 digital audio toolbox b43 SDI audio converter / router b44 digital audio delay b45
digital desktop mixer	mix4
transmission signal processing	digital transmission processor d07
digital voice processing	voice and monitor processor v01 digital voice processor v02 dual channel voice processor v03 digital voice processor v05
digital audio modular processing system C8000	
SDI interface modules SDI20	

jünger audio

JÜNGER AUDIO - Studiotechnik GmbH
Justus-von-Liebig-Str. 7, D - 12489 Berlin, GERMANY
Tel.: +49 30 6777210, Fax.: +49 30 67772146

www.junger-audio.com