DEN 8000

Encoder

4xA/V → ASI
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1. SAFETY INSTRUCTION

- Read this manual carefully before use.
- Do not open the case without disconnecting it from the mains.
- Allows the air circulation around the equipment.
- Protects against the water or liquids drops on the equipment.
- Do not place near to the heat sources.
- Do not obstruct the ventilation slots.

2. SYSTEM PRINCIPLE

2.1. SYSTEM DIAGRAM
2.2. WORKING PRINCIPLE

The DEN 8000 encoder structure is as per above picture, which consists of AV A/C process unit, AV encoding unit, TS process unit, data output unit and CPU.

2.2.1 VIDEO AUDIO A/D PROCESS

AV A/D process unit converts analog audio & video input into digital format and send it to encoding chipset. Video port supports ordinary signal source in broadcasting and various standard video & audio signal ports, including analog CVBS input and mono, stereo audio input. PAL/NTSC are both acceptable in this device.

2.2.2. A V ENCODING

AV encoding adopts MPEG-2 real-time encoding chipset, encoding the digital AV signal as MPEG-2 format. The video encoding process is according to MPEG-2 main profile (MP@ML), max bit rate is 15Mbps. The audio encoding process is done by professional audio encoding software according to MPEG-2 layer I and layer II.

2.2.3. A V TS PROCESS

A V TS multiplexing includes the 4 routes ES to MPTS process. All data are MPEG-2 compliance.

2.2.4. DATA OUTPUT PORT

The output TS is compliant with DVB ASI.

3. SPECIFICATIONS

3.1. APPLICATION
The DEN 8000 encoder transforms the 4 input analogue A/V sources into a single DVB-ASI digital stream.

3.2. CHARACTERISTICS
> Multiplexer function for up to 4 analogue A/V sources (PAL, NTSC).
> MPEG-2 MP@ML output video encoding, bit rate 1-15Mbps.
> MPEG-1 Layer 1, Layer 2 audio encoding.
> Programming via front panel (keyboard + LCD display) or PC (local or remote).
> Mountable in 19” rack.
> Includes:
  - 4 x 3RCA-3BNC cables for 4 analogue A/V sources.
  - 1 x BNC-F(m) cable for one COFDM output.
  - 1 x user’s manual.
  - 1 x 230Vac cable.

<table>
<thead>
<tr>
<th>Model</th>
<th>DEN 8000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference</td>
<td>08200</td>
</tr>
<tr>
<td><strong>INPUTS</strong></td>
<td></td>
</tr>
<tr>
<td>Video format</td>
<td>CVBS</td>
</tr>
<tr>
<td>Video standard</td>
<td>PAL, NTSC</td>
</tr>
<tr>
<td>Video connector</td>
<td>BNC, 75 Ohm</td>
</tr>
<tr>
<td>Audio input</td>
<td>1xStereo / 2xMono</td>
</tr>
<tr>
<td>Audio connectors</td>
<td>2xBNC, 600 Ohm</td>
</tr>
<tr>
<td><strong>OUTPUT</strong></td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td>DVB-ASI</td>
</tr>
<tr>
<td>ASI connectors</td>
<td>2xBNC, 75 Ohm</td>
</tr>
<tr>
<td>Video encoding</td>
<td>MPEG-1, MPEG-2 MP@ML</td>
</tr>
<tr>
<td>Video Bit Rate Mbps</td>
<td>1-15</td>
</tr>
<tr>
<td>Video format</td>
<td>Full D1, Half D1, SIF</td>
</tr>
<tr>
<td>Audio encoding</td>
<td>MPEG-1 Layer1, Layer 2</td>
</tr>
<tr>
<td>Audio Sample Rate</td>
<td>32, 44,1, 48</td>
</tr>
<tr>
<td>Power supply Vac</td>
<td>90 ÷ 250</td>
</tr>
<tr>
<td>Consumption W</td>
<td>25</td>
</tr>
<tr>
<td>Operating temperature °C</td>
<td>0 ÷ 45</td>
</tr>
<tr>
<td>Package dimensions mm</td>
<td>580 x 580 x 135</td>
</tr>
<tr>
<td>Weight kg</td>
<td>6,2</td>
</tr>
</tbody>
</table>
4. EQUIPMENT CONNECTION

4.1. FRONT PANEL DISPLAY AND KEY BUTTON

LEFT, RIGHT: move the cursors
UP, DOWN: change parameters
ENTER: confirm and operate
Exit: back to upper menu or cancel the setting

Note:
A. press ENTER and EXIT to unlock if device is in lock status
B. keyboard auto lock after 60 seconds without operation
C. in lock status, press "down" to see IP menu

1. LCD
2. Error indicator
3. POWER indicator
4. Directional arrow key
5. Enter
6. Exit
7. ENC 1~ENC4 Encoder Indicator
4.2. REAR PANEL

1. CH1 A/V input
2. CH2 A/V input
3. CH3 A/V input
4. CH4 A/V input
5. ASI port (optional) / IP out (optional)
6. ASI output port 1
7. ASI output port 2
8. Ethernet port
9. Power switch
5. OPERATION

5.1. BASIC PROGRAMMING GUIDE

- Switch on the power switch 9; the Front panel “Power” LED will be on
- Connect the A/V inputs: Yellow RCA to “CVBS”; White RCA to “L” input & Red RCA to “R” input. When an useful signal is detected, the front panel ENC 1, ENC 2, ENC 3 or ENC 4 will be on
- Connect the ASI output port 6 or 7 to the DMT 8000 ASI Input
- The output bit rate is factory preset at 26 Mbps and each encoder at 6 Mbps. Both parameters can be modified by programming
- Service name edition (Example Encoder 1): Section 5.2.6.4
  - Encoder 1 > System > Program Name
  If one of the inputs is not used, this input could be removed from the output MUX
  Entering in: Encoder x > Multiplexing > YES/NO: Section 5.2.3

5.2. MENU OPTION

5.2.1. LOCK STATUS DISPLAY

DEN 8000 4IN 1 Encoder
PG:04 BR: 00.000Mbps

5.2.2. MAIN MENU DISPLAY

1. Encoder 1
2. Encoder 2
3. Encoder 3
4. Encoder 4
5. Output setting
6. Network setting
7. Save config.
8. Load config.
10. Language
11. Error info

5.2.3. ENCODER SETTING: Each encoder can be programmed using Up/Down keys and pressing ENTER to confirm.

1.1 Multiplexing
  1.1.1 Yes/No
1.2 Video
1.3 Audio
1.4 System
5.2.4. **VIDEO SETTING**: Select video config, LCD display as below:

1.2.1 Video Enable
1.2.2 Video mode
1.2.3 GOP
1.2.4 Brightness
1.2.5 Contrast
1.2.6 Saturation
1.2.7 Hue
1.2.8 Compression

5.2.4.1. **VIDEO ENABLE**: The user can switch ON/OFF the video at the output

1.1.1 Video Enable
   1 On
   0 Off

5.2.4.2. **VIDEO MODE**: Three options can be chosen (Auto, NTSC or PAL)

1.1.2 Video mode
   Auto
   NTSC
   PAL

5.2.4.3. **VIDEO GOP**: Four structures could be chosen, the IBBP is recommended

1.1.3 GOP
   I
   IP
   IBP
   IBBP

5.2.4.4. **BRIGHTNESS**: The image brightness is adjusted

1.1.4 Brightness
   127

5.2.4.5. **CONTRAST**: The video contrast is adjusted

1.1.5 Contrast
   127

5.2.4.6. **SATURATION**: The color saturation is adjusted

1.1.6 Saturation
   127
5.2.4.7. **HUE:** The color hue is adjusted

<table>
<thead>
<tr>
<th>1.1.7 Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>+000</td>
</tr>
</tbody>
</table>

5.2.4.8. **VIDEO COMPRESSION:** The user can select one of them

<table>
<thead>
<tr>
<th>1.1.8 Video compression</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
</tr>
<tr>
<td>3/4D1</td>
</tr>
<tr>
<td>2/3D1</td>
</tr>
<tr>
<td>HD1</td>
</tr>
<tr>
<td>SIF</td>
</tr>
</tbody>
</table>

5.2.5. **AUDIO SETTING:** The following parameters can be settled

<table>
<thead>
<tr>
<th>1.2.1 Coding Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2.2 Sampling Freq.</td>
</tr>
<tr>
<td>1.2.3 Output bit rate</td>
</tr>
<tr>
<td>1.2.4 Audio mode</td>
</tr>
</tbody>
</table>

5.2.5.1. **AUDIO ENCODING TYPE:** Two options can be chosen

<table>
<thead>
<tr>
<th>1.2.1 Audio Encoding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer1</td>
</tr>
<tr>
<td>Layer2</td>
</tr>
</tbody>
</table>

5.2.5.2. **SAMPLING FREQUENCY:** There are three sampling rates to select

<table>
<thead>
<tr>
<th>1.2.2 Sampling rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 KHz</td>
</tr>
<tr>
<td>32 KHz</td>
</tr>
<tr>
<td>44.1 KHz</td>
</tr>
</tbody>
</table>

5.2.5.3. **AUDIO BITRATE SETTING:** One of them can be chosen

<table>
<thead>
<tr>
<th>1.2.3 Output bit rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>384Kbps</td>
</tr>
<tr>
<td>256Kbps</td>
</tr>
<tr>
<td>128Kbps</td>
</tr>
<tr>
<td>96 Kbps</td>
</tr>
<tr>
<td>64 Kbps</td>
</tr>
</tbody>
</table>
5.2.5.4. **AUDIO MODE:** There are the following options

- Stereo
- Joined Stereo
- Dual
- Single Channel
- Single

5.2.6. **SYSTEM SETTING:** The programmable parameters are

- **ENCODING BITRATE:** In this menu we can set the output bit rate of each encoder, 6Mbps is settled as a factory default

- **BIT RATE MODE:** In this menu the user can select the bit rate mode. CBR is recommended

- **PROGRAM PROVIDER:** The program provider name could be edited

- **PROGRAM NAME:** The name of the program can be edited
5.2.6.5. **PROGRAM NUMBER:** The user can set the program number

| 2.4.5 Prog number 0001 |

5.2.6.6. **PMT PID:** The user can set the PMT and PID

| 2.4.6 PMT PID 0256 |

5.2.6.7. **VIDEO PID:** The user can set the video PID number

| 2.4.7 VIDEO PID 0257 |

5.2.6.8. **AUDIO PID:** The user can set the audio PID number

| 2.4.8 AUDIO PID 0258 |

5.2.6.9. **PCR PID:** The user can set the PCR PID number

| 2.4.9 PCR PID 0259 |

5.2.7. **OUTPUT SETTING:** Press up/down to select the configuration

| 5 Output setting 5.1 Output bit rate 5.2 TS ID |

5.2.7.1. **OUTPUT BITRATE:** The user can set the total output bit rate

| 5.1 Output bit rate 026.000 Mbps |

It should be higher than the total value of the 4 channel’s bit rate.

If each channel encoding bit rate is 6 mbps, the total value is 24 mbps, therefore it should be settled 26 for example.
5.2.7.2. **TS ID**: The user can set the TS ID

<table>
<thead>
<tr>
<th>5.2 TS ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>00000</td>
</tr>
</tbody>
</table>

5.2.8. **NETWORK SETTING**: The user can define the following Network parameters for Ethernet local or remote access

<table>
<thead>
<tr>
<th>6.1 IP address</th>
</tr>
</thead>
<tbody>
<tr>
<td>192.168.000.131</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.2 Sub net mask</th>
</tr>
</thead>
<tbody>
<tr>
<td>255.255.255.000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.3 gateway</th>
</tr>
</thead>
<tbody>
<tr>
<td>192.168.000.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.4 NMS UDP port</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.5 MAC address</th>
</tr>
</thead>
<tbody>
<tr>
<td>00-45-34-84-02-21</td>
</tr>
</tbody>
</table>

5.2.9. **SAVE CONFIG**: Press ENTER to save

<table>
<thead>
<tr>
<th>7. Save Config.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Please Wait</td>
</tr>
</tbody>
</table>

5.2.10. **LOAD CONFIG**: The user can choose one of them

<table>
<thead>
<tr>
<th>8. Load conf.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.1 Load Saved Config</td>
</tr>
<tr>
<td>8.2 Default Config</td>
</tr>
</tbody>
</table>
5.2.11. **VERSION:** The Software and Hardware version are displayed

9. Version
SW: 1.14  HW: 1.03

5.2.12. **LANGUAGE:** The display language is English

10 Languages
English

5.2.13. **ERROR MESSAGES:** The display shows the systems errors

11 Error info
04: ASI Unlocked

6. **SYSTEM FAILURE OR TROUBLE SHOOTING**

6.1. **INDICATOR STATUS**

There are 2 LED Indicators

1 “POWER”: Green means right powering
2 “ERROR”: Red means system error

6.2. **TROUBLE SHOOTING**

6.2.1 “POWER” OFF.- Check the mains connection

6.2.2 “ERROR” ON .- System error, check the display read-out

6.2.3 ENC INDICATOR OFF.- Check the A/V input connection and verify the type of analogue signal (1 Vpp CVBS Video)
Declaración de Conformidad

Fabricante/ Fabricant/ Manufacturer/ Fabricante: FAGOR ELECTRONICA, S.COOP.

Dirección/ Adresse/ Address/ Direção: Bº San Andrés s/n - P.O. Box 33 20500 MONDRAGON (Guipúzcoa) Spain

NIF / VAT: F-20 027975

Declara bajo su exclusiva responsabilidad la conformidad del producto:
Declare, sous notre responsabilité, la conformité du produit:
Declare under our own responsibility the conformity of the product:
Declara exclusiva responsabilidade a conformidade do produto:

DEN 8000

Según los requerimientos de las Directivas del Parlamento Europeo:
Selon les specifications des Directives du Parlement Européen:
According to the specifications of directives of the European Parliament:
Com as especificações da Directivas do Parlamento Europeu:

EMC 2004/108/EC
LVD 2006/95/EC
RoHS 2011/65/EC

Para su evaluación se han aplicado las Normas:
Pour l'évaluation ont été appliqués les Normes:
For the evaluation, the following Standards were applied:
Para a avaliação, os seguintes Normas foram aplicados:

EN 55020 :2007
EN 61000-3-2 : 2008

Fecha: Oct. 2011

Firma: J.M. Saiz

Signatura: Jefe Calidad Tratamiento de Señal
Head of Quality Dept., Signal Processing