



User's Manual

The ATMOS and MADI Software

DKT7++, Version 2017, Release date 2017-05-01

Revision 1.0

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Preliminary

The ATMOS and MADI Option

Before you begin...

Thank you for purchasing the ATMOS and MADI software for the DKT7 family members.

The software packages are included the standard software update from May 2017 release but it requires separate license key(s) to function. License key(s) can be obtained from your local dealer or by contacting the DK-Technologies sales office directly on the below email address.

This manual is covering two separate licensed options which in most cases are needed in an ATMOS environment. However, if the number of channels used is limited to maximum 16 the audio signal can be embedded in the video signal and there is no need for the MADI (64 channels).

The manual will describe the different operation modus.

With the clear DK T7 readout and compliance in your line of sight, you are always **safe and sound**.

About this manual

The intension of this manual is to provide you with a quick overview of ATMOS and MADI option in order to benefit from the advanced function found in the software package and it is assumed that the reader has a basic knowledge of the DKT7 functionality.

Please study the general DKT7 operational manual on how to navigate and setup the unit. The manual can be download by following the below link.

Happy reading!

Please note: DK-Technologies reserve the rights to change the content of this manual at any time. The latest revision of this manual can be downloaded from: www.dk-technologies.com

Email contact: info@dk-technologies.com

Other Important Notes

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Purpose

Any fitness for purpose legislation or other determination that may be applied in the area where this equipment is installed must take due cognizance that it is designed for use in professional broadcast, audio and video systems by appropriately trained personnel. The equipment is not intended for use in a domestic environment and regulations designed for such situations are not applicable.

After sales modifications

Any modifications to the equipment not specifically authorized and approved by DK-Technologies A/S may invalidate the equipment warranty. This includes changes to cabling and variations to the recommended installation as detailed in the documentation issued by DK-Technologies A/S. Modifications can invalidate EMC and safety features designed into this equipment and the manufacturer cannot be liable for any legal proceedings or problems that may arise relating to such modifications. No sales agent or other person involved in the supply chain is permitted to authorize variations from the content of this documentation.

Important Safety Instructions

- Read these instructions. Study carefully and understand all safety and operating instructions before you install and operate the unit!
- Keep these instructions. Keep all safety and operating instructions for future reference!
- Heed all warnings on the unit and in the safety and operating instructions before you install and operate the unit!
- Follow all instructions to ensure against injury to yourself and damage to the unit or other objects connected to the unit.

- To prevent possible electrical shock, death, fire, injuries and malfunctions, use this product only as specified.
- Only use attachments and accessories specified by the manufacturer.
- The units of the DK Meter range are designed for indoor use only

Preliminary

Quick Overview of the Functionality

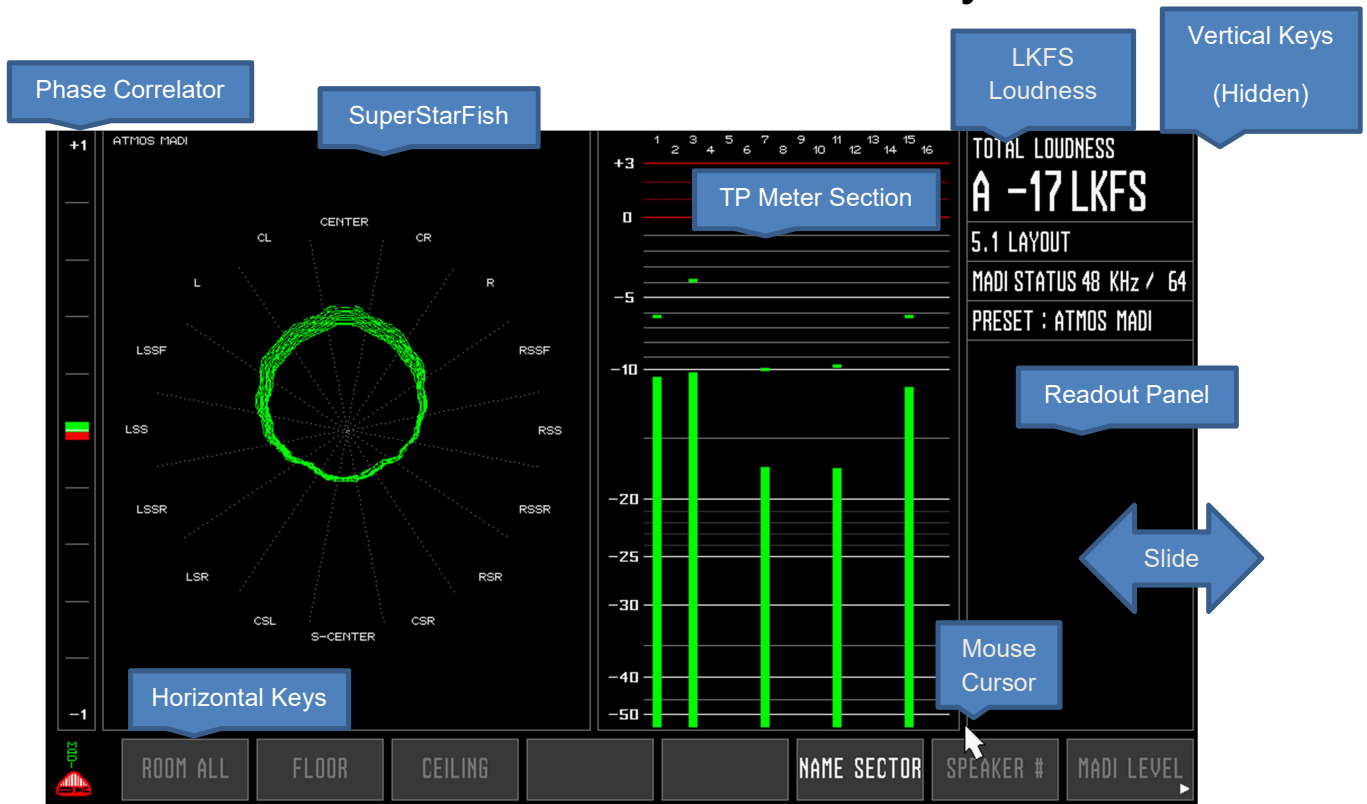


Figure 1. The Basic Screen Layout

The Basic Concept

The hardware unit is fully self-contained and the Control Surface has a wide viewing angle 7" multi-touch screen user interface incorporating USB mouse control and an HDMI interface connects directly to a television or computer monitor supporting 8 channels of embedded audio.

The input signals can be sources as SDI embedded audio channels, AES or MADI including a TDM router for audio distribution and monitoring.

Appendix B is a list of touch screen control sequences and valid mouse commands.

The SuperStarFish

The SuperStarFish is an enhanced functionality of the JellyFish and StarFish surround sound tools. The number of sectors is fixed to 16 each visualizing the audio in approximately 22 degrees out of a unity circle of 360 degrees. The phase correlation is calculated for adjacent sectors and marked with red colour in order to operators attention. The SuperStarFish is providing a uniform presentation of the surround sound signal

independent of the speaker layout and the surround sound format. Additional functionality is provided depending of the operation modus described in detail in the following chapters.

The Phase Correlator

The left hand phase correlator can be used to obtain the phase correlation between user defined sectors on the unity circle.

The Meter Section

The Meter Section hold the audio level bar graph tool with got many different operation modes and layouts. In the ATMOS MADI display mode shown above each bar graph is showing the total level of each sector. The left hand bar graph (1) corresponds to the level in the first sector of the SuperStarFish, Centre, (3) is Right and the rightmost (16) correspond to the Centre Left sector marked CL. The rotation is clockwise 1 to 16. The shown scale is a True-Peak (TP) where zero is maximum encoded digital level FS. Multiple speaker objects in the same sector and digital processed audio signal will generate levels above full scale. The bar graph tool is calibrated to digital full scale indicating zero.

The Readout Panel with LKFS

The readout panel is user configurable and two vertical display size are available, namely 4 lines and 16 lines. The sample layout is showing the total ATMOS loudness level which is calculated in accordance with ITU and R128 specification. The value is the frequency weighted total power of all sectors of the SuperStarFish. The value is described with the letter A LKFS where the reference level is -24dBFS @ 1kHz.

The example also readout the MADI status, selected layout and the current selected preset name.

The horizontal Control Keys

All menu keys are user assignable and in total there are 24 horizontal and 24 vertical assignable positions. The current assignment is useful when working with ATMOS. The three leftmost keys are used to control the vertical audio layer to inspect. ROOM ALL provide a top view including all levels, FLOOR is lower level speakers and CEILING the top level speakers. To the right you can select to describe the sectors by name, speaker location or speaker location including audio level.

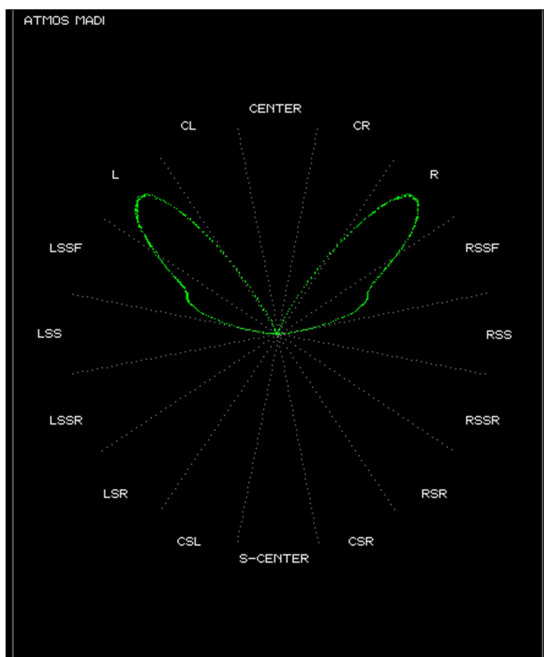


Figure 4. SuperStarFish Sector Names

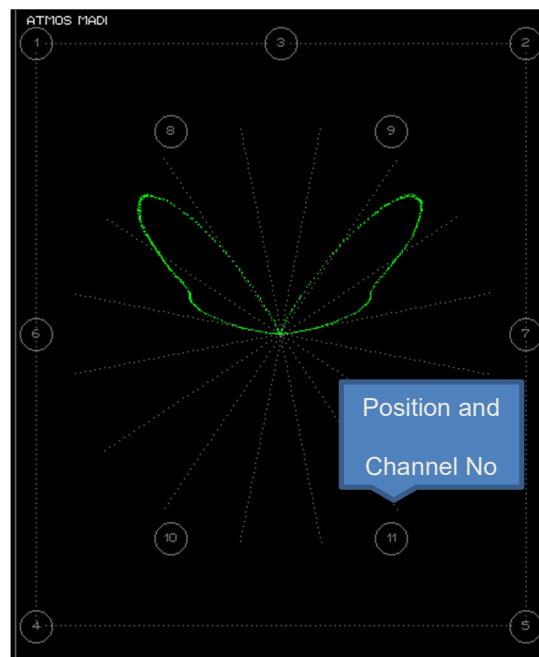
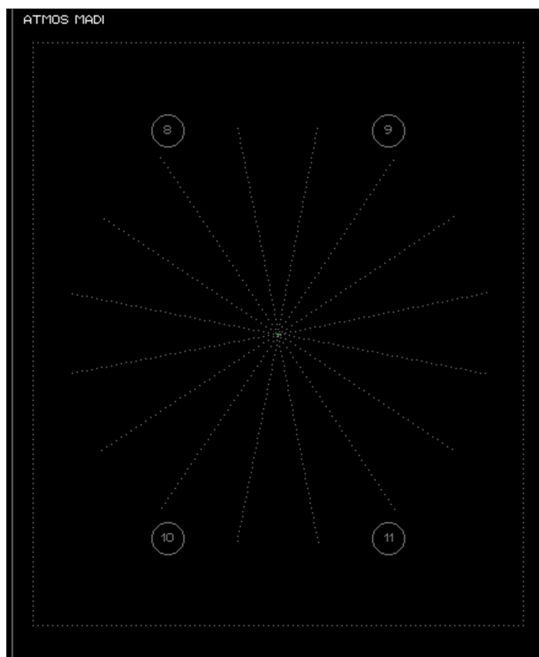
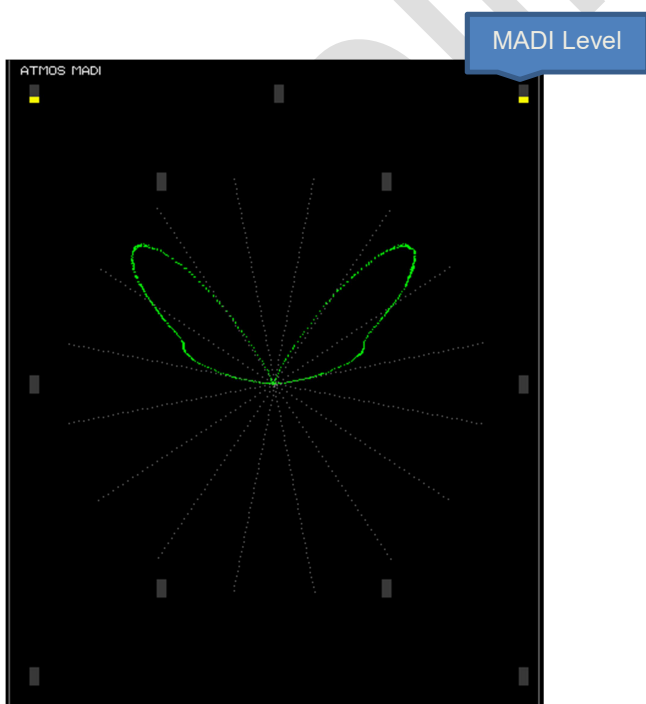


Figure 3. 7.1+4 Speaker Map with Channel Numbers

Figure 2. 7.1+4 MADI Channel Levels and Positons

Figure 5. 7.1+4 Speaker Map Ceiling Part



Installing the License Keys

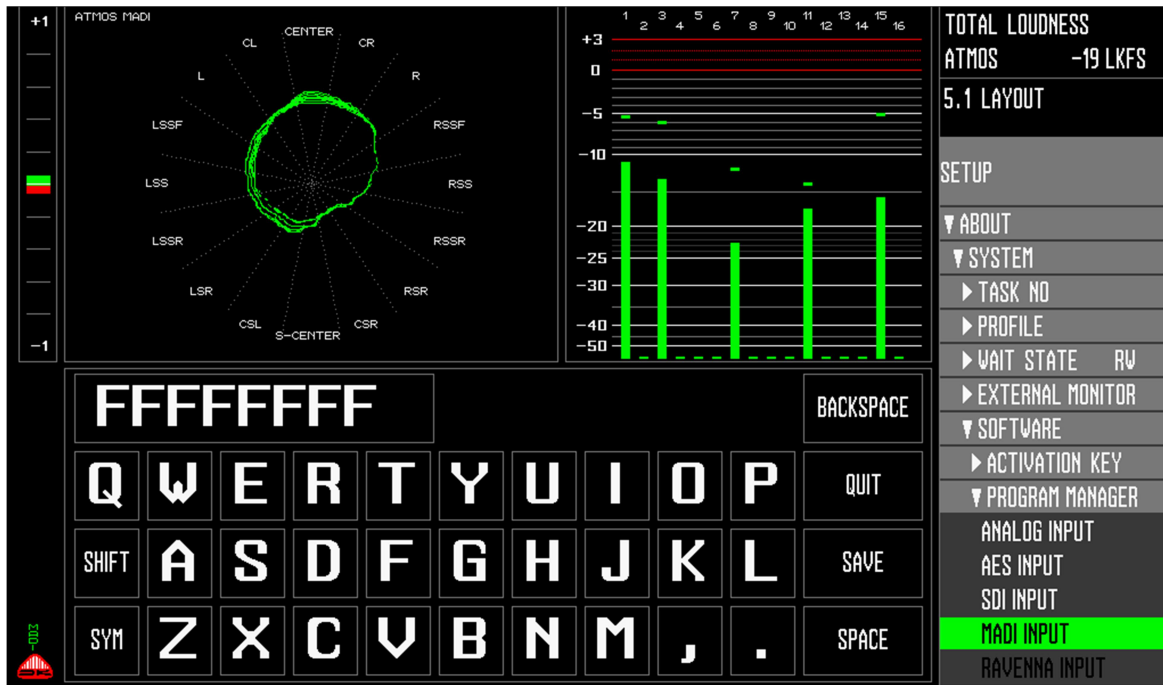


Figure 6. The MADI License Key Entry

The 8 character wide License Key is entered in the PROGRAM MANAGER folder located in the SETUP folder as shown above. Legal characters are 0..9 and A,B,C,D,E and F.

Touch the folder line MADI INPUT in order to engage the editor. BACKSPACE the displayed keys and enter the provided 8 characters excluding any white spaces, press SAVE and QUIT and the software is ready to use after a re-power cycle.

The ATMOS license is a separate key located on the 11th position on the list. The Installation procedure is the same as for the MADI License.

Sales Part Numbers

DKT7SW ATMOS

DKT7SW MADI

Configuring the Control Surface

The SuperStarFish Section

The Phase Correlator

The Meter Section

The Vertical Readout Panel

The Horizontal Control Keys

The Vertical Control Keys

Getting the Software Version

The current software version is listed in the SETUP folder under SOFTWARE. The layout of the SETUP varies depending on installed software modules and their release version. The folder shown is valid for the 2017 May release.

Free Updating of the Software

The software is updated to the most recent release by means of the online updater which can be downloaded from the DK-Technologies web-site:

<http://www.dk-technologies.com/?wpdmdl=145>

Please download and run.



Figure 7. Software Release

Getting the Firmware Version

In SETUP folder under HARDWARE the installed firmware is listed as the two last characters as shown, D3. This version is the minimum for the MADI and ATMOS functionality. The firmware is automatically installed when updating from the online updater.

Configuring the SD Input for MADI

The SD input got dual functionality and is able to alternate between usage as a SD video input or a MADI digital audio input. Three different operational modes:

- SDI EMBEDDER
- MADI
- SPEAKER MAP

Mode one is the normal video mode, Mode two change the functionality to interpret the serial input stream as a MADI formatted stream. 64 digital audio channels is available through the matrix assignment software like any other audio source. Mode three is used in ATMOS and MADI. In this mode channels are considered as speaker object and automatically assigned to the sector meter and SuperStarFish.

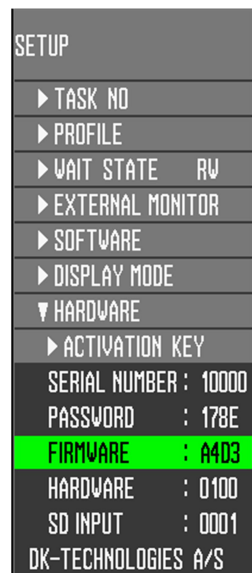


Figure 8. Firmware Version



Figure 9. SDI Configuration

The Object Scripting Language Reference

The scripting language is used to define the location of the speaker object and the object names. Each object is defined with a X,Y,Z location information. Appendix A is a sample object file with can be edited by any notepad editor.

The separation character is a semicolon and excess field and characters are ignored.

Syntax List

REM;This is a remark

LAYOUT; This text is the name listed Max size is 20 chars. The key word also serves as a begin marker for each layout set. Maximum numbers of sets are 8.

SPOBJ;No;X;Y;Z; No designated the MADI channel. The valid range is 1 to 64 for the MADI channel assignments. X,Y,Z is a signed number between -999 and +999. Spaces are not permitted in numbers.

EOF End of File marker will terminate the file scripting and must be present at least once in a file.

The X,Y,Z coordinates can be considered to be in centimetres, feet's, meters since the scaling is automatic according to the physical space where the speakers are installed. The menu readout is limited to 4 digits including a sign but not the internal calculation. Larger numbers will provide a higher precision when working with the ATMOS speaker objects.

Note. The current maximum file size is 4096 bytes. The filename including the extension must be exactly as shown ATMOSCFG.FE0. The file is downloadable with the standard DKMeterUpdate or with a drag and drop action to the DKMeterOnline updater control surface. Both files are available on www.dk-technologies.com.

Important notice: The USB driver needed by the DK application software is included as standard in Windows 10.

Key Words

| | |
|-------------------------|------|
| ATMOSCFG.FE0..... | 8 |
| Email Contact | 3 |
| EOF..... | 8 |
| LAYOUT..... | 8 |
| License Key | 3; 7 |
| REM | 8 |
| Sales Part Numbers..... | 7 |
| SPOBJ | 8 |
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Appendix A

Sample of the MADl Speaker Object File

REM; 2017 May 1th

LAYOUT;16 SECTORS LAYOUT

SPOBJ;01;0000;0100;0; center

SPOBJ;02;0045;0070;1; right front ceiling

SPOBJ;03;0100;0100;0; right

SPOBJ;04;0100;0045;0; right side front

SPOBJ;05;0100;0000;0; right side center

SPOBJ;06;0100;-045;0; right side rear

SPOBJ;07;0100;-100;0; right surround

SPOBJ;08;0045;-070;1; right rear ceiling

SPOBJ;09;0000;-100;0; center rear

SPOBJ;10;-045;-070;1; left rear ceiling

SPOBJ;11;-100;-100;0; left surround

SPOBJ;12;-100;-045;0; left side rear

SPOBJ;13;-100;0000;0; Left side center

SPOBJ;14;-100;0045;0; left side front

SPOBJ;15;-100;0100;0; left

SPOBJ;16;-045;0070;1; left front ceiling

LAYOUT;5.1 LAYOUT

SPOBJ;01;-100;0100;0; left

SPOBJ;02;0100;0100;0; right

SPOBJ;03;0000;0100;0; center

SPOBJ;04;-100;-100;0; left surround

SPOBJ;05;0100;-100;0; right surround

LAYOUT;7.1 LAYOUT

SPOBJ;01;-100;0100;0; left

SPOBJ;02;0100;0100;0; right

SPOBJ;03;0000;0100;0; center
SPOBJ;04;-100;-100;0; left surround
SPOBJ;05;0100;-100;0; right surround
SPOBJ;06;-100;0000;0; Left side center
SPOBJ;07;0100;0000;0; right side center
LAYOUT;7.1 + 4 LAYOUT
SPOBJ;01;-100;0100;0; left
SPOBJ;02;0100;0100;0; right
SPOBJ;03;0000;0100;0; center
SPOBJ;04;-100;-100;0; left surround
SPOBJ;05;0100;-100;0; right surround
SPOBJ;06;-100;0000;0; Left side center
SPOBJ;07;0100;0000;0; right side center
SPOBJ;08;-045;0070;1; left front ceiling
SPOBJ;09;0045;0070;1; right front ceiling
SPOBJ;10;-045;-070;1; left rear ceiling
SPOBJ;11;0045;-070;1; right rear ceiling
LAYOUT;4 LAYOUT
SPOBJ;01;-045;0070;1; left front ceiling
SPOBJ;02;0045;0070;1; right front ceiling
SPOBJ;03;-045;-070;1; left rear ceiling
SPOBJ;04;0045;-070;1; right rear ceiling
LAYOUT;THEATER LAYOUT 24
SPOBJ;01;0000;0100;0; center
SPOBJ;02;0045;0070;1; right front ceiling
SPOBJ;03;0100;0100;0; right
SPOBJ;04;0100;0045;0; right side front
SPOBJ;05;0100;0000;0; right side center
SPOBJ;06;0100;-045;0; right side rear
SPOBJ;07;0100;-100;0; right surround
SPOBJ;08;0045;-070;1; right rear ceiling

SPOBJ;09;0000;-100;0; center rear
SPOBJ;10;-045;-070;1; left rear ceiling
SPOBJ;11;-100;-100;0; left surround
SPOBJ;12;-100;-045;0; left side rear
SPOBJ;13;-100;0000;0; Left side center
SPOBJ;14;-100;0045;0; left side front
SPOBJ;15;-100;0100;0; left
SPOBJ;16;-045;0070;1; left front ceiling
SPOBJ;17;-070;0070;1; left front-1 ceiling
SPOBJ;18;0070;0070;1; right front+1 ceiling
EOF

Appendix B

Touch Screen Commands

USB Mouse Commands

Preliminary