The BeoModern 7000 is a missing piece that brings BeoSystem 6500/7000 music entertainment centre, into 21st century.

The BeoModern 7000 expands BeoSystem capabilities by providing mp3/flac player, internet radio receiver, DAB radio receiver, Bluetooth receiver and transmitter, convenient aux input, RDS info display, clock with auto off capabilities and signal level, envelope tracker or spectrum analyzer dynamic visual display.

The BeoModern 7000 is designed to works in concert with other parts of BeoSystem 6500/7000. The BeoMaster 6500/7000 is used as an arbiter to control BeoModern 7000. The MPC6500 or Beo4/5/6 remote controller can be used to operate it from convenience of your armchair.

User's guide

This User's guide describes the operation of
the BeoModern 7000. Each function described
in this guide is accompanied by a set of
control buttons, situated either on MCP6500,
Beo4 or front panel.

Inserts with step-by-step guidance to the
MPC6500/Beo4 remote control are also
included. These sets of actions will guide you
through each mode of operations.

The BeoModern 7000 may be used with
various types of Bang & Olufsen TV or Audio
systems that provide Datalink capabilities and
can work with MCP6500 or Beo4 type remote
controllers.

Note:
Setting-up instructions are found at the end
of this guide.

Complete list of contents and page references

General functions for close-up operation

There are two buttons accessible to the user on BeoModern front panel together with comprehensive status display.

Displays extra information relevant to data displayed on alphanumeric section or selected active mode

The display using 24 characters, keeps you informed about what the BeoModern 7000 is doing. E.g. playing a track Model by Kraftwerk with 185 seconds left to enjoy the song

Displays section light up and inform user of selected and active mode of operation

BT Tx   TIMER   Kraftwerk – Model   185   PLAYER

STEP PROGRAM   BANG & OLUFSEN   BEOMASTER 7000   MUTE
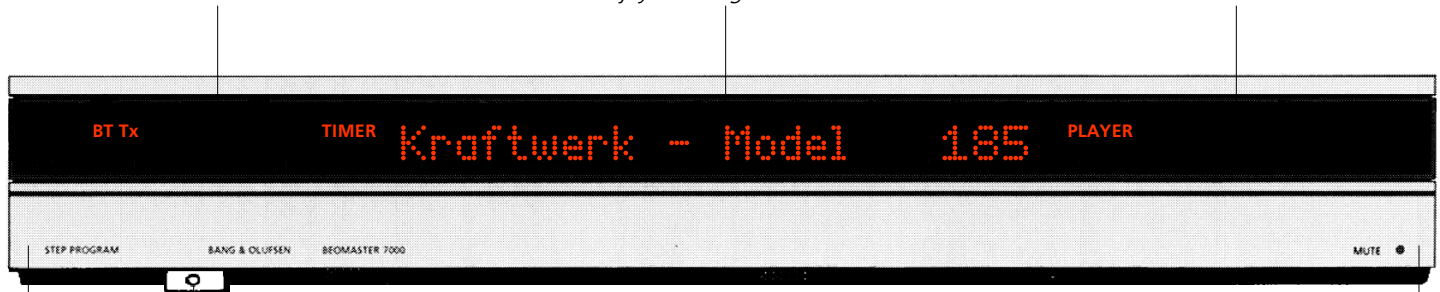
Socket for providing Aux IN analog stereo signal

*Short press - changes active mode of operation
Long press – powers down BeoModern*

*Short press – this action changes its personality depending on selected mode of operation
Long press - changes information displayed by BeoModern*

Quick overview of Master Control Panel 5500/6500

The buttons used to interact with BeoModern are highlighted below. Following sections will get into details about their use.

| PLAY | STOP | Start/stop song, approves/rejects new settings, sets timer off, pause/mute BT, re-connects BT |

| << | >> | Moves by 10S back/forward, moves thru folder tree, selects iRadio/DAB station, moves between BT songs |

| TURN | Modifies time settings, starts BT pairing |

| > DISPLAY > | Toggles BeoModern display mode |

| RESET | Cancels clock/timer config |

| 1 ••• 8 | Selects Active BeoModern state (in AUX mode) |

| < STEP | STEP > | Moves within active folder and thru folder tree, selects iRadio/DAB station, moves between BT songs, modifies clock/timer off values |

| AUX | Switches on BeoModern unit to its last state. With 1-8 digits user can select active mode. |

| ● | Powers down BeoSystem including BeoModern unit |
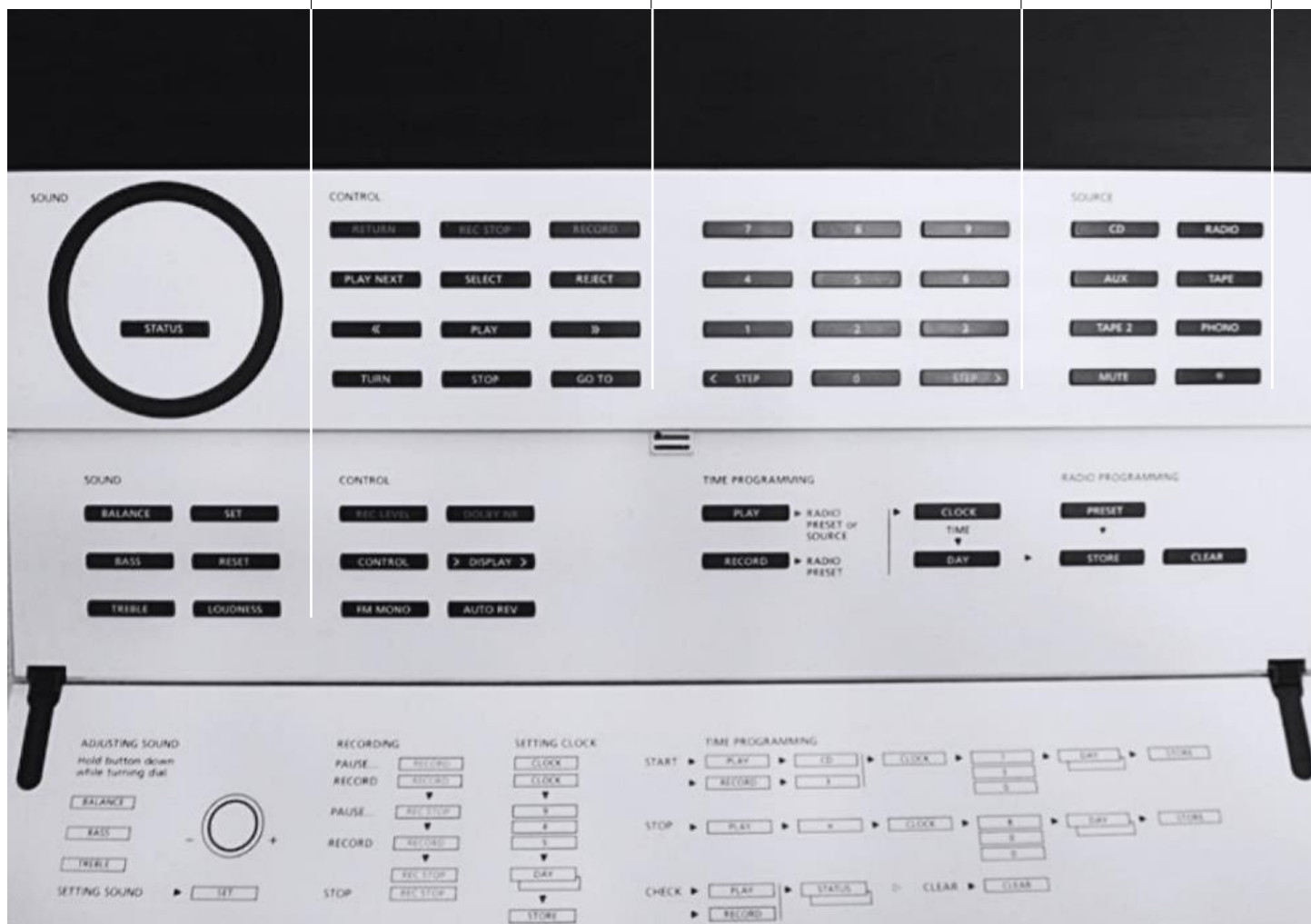
Using the Beo4

The BeoSystem 6500/7000 can be operated from a distance via the Beo4 remote control. The Beo4 step-by-step operating sequences are shown as inserts framed in boxes throughout this user's guide.

The Beo4 remote controller operates all the primary functions of the BeoModern 7000 such as selecting active mode, changing iRadio/DAB programs, controlling BT receiver or transmitter. It also selects BeoModern display content.

The Beo4 remote control also enables you to select specific song in the folder, navigate thru folder structure, search forward and backward in song, switch on and set the timer off as well as set internal clock.

Note: Please refer to the Beo4 User's guide for further information about the Beo4 principles of operation.

In order to interact with BeoModern using Beo4, you have to add to the Beo4 list of functions A.AUX mode. BeoModern reacts to commands sent to A.AUX device. Please refer to your Beo4 User's guide and the chapter Customizing your Beo4 for further instruction.

Nice to know…

In the step-by-step operating sequences, the buttons on the Beo4 and cues in the display will be illustrated like this:

| MENU | Rectangular buttons for e.g. sources, numbers, and volume regulation |

▲ Buttons incorporated in the large star-shaped button for stepping up or down and forwarding and rewinding

GO A small, round GO button incorporated in the large star-shaped button which stores, accepts and executes control operations

Colored buttons incorporated in the star-shaped button for special functions

LIST The double-button means 'press repeatedly' on LIST

A.AUX Cues in the Beo4 display

A.AUX

TV	LIGHT	RADIO
SAT	DVD	CD
V TAPE	RECORD	A TAPE
7	8	9
4	5	6
1	2	3
TEXT	0	MENU

GO

| LIST | EXIT |
| STOP | ● |

Selecting mp3/flac player mode

One of the modes of operation that BeoModern offers is mp3/flac Player. It utilize BeoModern internal memory storage to keep your favorite music easily accessible for you to enjoy.

When Player mode is activated, BeoModern display on the right side label: "PLAYER". At the same time, display will start to print out band name followed by song title. If band and title information won't fit on a

display, BeoModern will scroll them continuously. Display will also inform you about number of remaining second of the song that is being played.

$$\text{Kraftwerk - Model   185}\quad\text{PLAYER}$$

To enable mp3/flac Player mode using Beo4, MCP or front panel, follow instructions described below. After a while you will remember that, to put it simply, player is "number 1".

MCP
To power up BeoModern into mp3/flac player state
AUX   Press to select AUX
then:
1   Press 1 to select mp3/flac Player
If already MCP is in AUX mode and BeoModern is ON simply
1   Press 1 to switch to mp3/flac Player

PANEL
To power up BeoModern into mp3/flac player state press button on the right hand side.
↑
If BeoModern wakes up into different state or if it is already in different state, press button on the right hand side (short press) to toggle states, until mp3/flac player mode is activated.

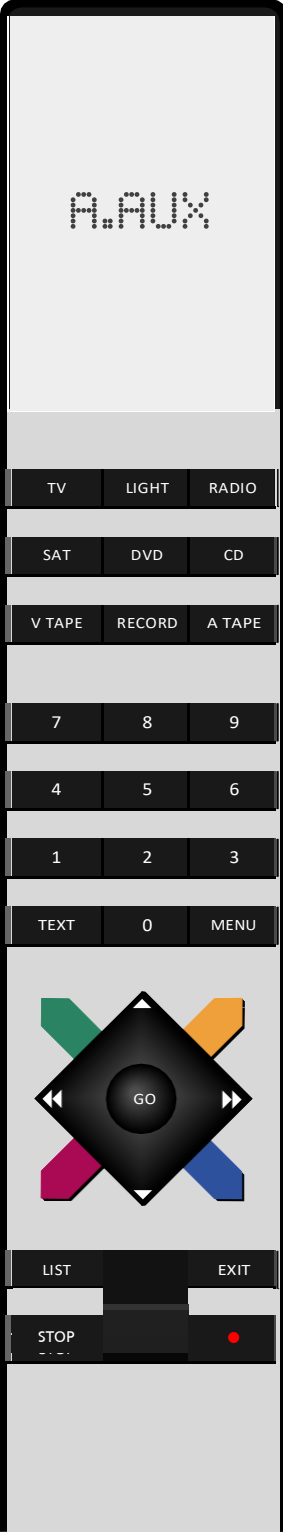| BEO4 |
|---|
| To power up BeoModern into mp3/flac player state |
| **LIST**   Press to select A.AUX |
| then: |
| **GO**   Press GO to activate A.AUX |
| then: |
| **1**   Press 1 to select mp3/flac Player |
| If already Beo4 is in A.AUX mode and BeoModern is ON simply |
| **1**   Press 1 to switch to mp3/flac Player |

Playing songs

While BeoModern Player, plays your favorite song, it is possible to Pause/Resume Player as well as to

move forward or back in 10 seconds step within played song. An indicator on display that informs about song remaining seconds will update its

values following your actions. You are in control.

.

MCP
While BeoModern plays your favorite song and MPC is in AUX mode you can:

STOP	To pause current song
PLAY	To resume play
>>	Move forward by 10 seconds
<<	Move back by 10 seconds

PANEL
When in Player mode, you can change current song to the next one in the folder by pressing (short press) button on the left hand side.

BEO4
While BeoModern plays your favorite song and Beo4 is in A.AUX mode you can:

STOP	To pause current song
GO	To resume play
▶▶	Move forward by 10 seconds
◀◀	Move back by 10 seconds

Selecting songs

The library of mp3/flac songs is stored inside BeoModern. Internal storage follows standard tree structure known from PC world. Basically all albums are represented by folders with songs as files inside them.

BeoModern Player allows user to navigate thru that folder structure and select any song you like to be played. Once song is selected, BeoModern Player will play in the loop all songs that are present inside current folder.

To help user with navigation BeoModern will,

- display digit cue with current song number follow by number of all songs in folder. This is done when user starts to navigate thru current folder. Lets call it, song selection within folder.

5/11 Kraftwerk - Model   PLAYER

- Folder navigation starts with user first navigating to 1st position in the folder called " 1/1 BACK" and then pressing left arrow on remote controller. From that point onwards user moves up in "folder tree" and starts to navigate thru folder structure.

- BeoModern displays all folder names using capital letters only while songs are displayed using capital and small letters.

- Cue with current folder number followed by number of all folders in current location helps intends to with navigation.

1/1 BACK   PLAYER

3/10 QUEEN - A KIND OF   PLAYER

- User can enter folder by pressing forward arrow. Once inside the folder, user can select song he wants to play next by pressing OK.

- Once song is selected, BeoModern will start to display band name and song title followed by remaining number of song seconds to be enjoyed.

Magic - One Vision   311   PLAYER

To navigate thru BeoModern folder structure user should rely on BeoModern display together with remote buttons highlighted below.

MCP

While BeoModern plays your favorite song and MPC is in AUX mode you can:

PLAY   To play selected song

>>   Move into folder

<<   Move up in folder tree when "1/1 BACK" folder is selected.
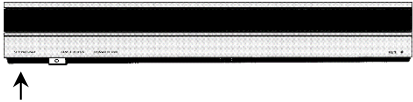
STEP >   Move up in songs list in current folder or between folders

< STEP   Move down in songs list in current folder or between folders

PANEL

When in Player mode, you can change current song to the next one in the folder by pressing (short press) button on the left hand side.

BEO4

While BeoModern plays your favorite song and Beo4 is in A.AUX mode you can:

GO   To play selected song

▶▶   Move into folder

◀◀   Move up in folder tree when "1/1 BACK" folder is selected.

▲   Move up in songs list in current folder or between folders

▼   Move down in songs list in current folder or between folders

Managing songs library

The BeoModern mp3/flac player offers 100GB of an on-board memory to store your favorite songs. Adding or removing songs from library is quite simple. When BeoModern connects to local network over WiFi or Ethernet

(look at the end of this user guide for technical details on interconnectivity) it will present itself as remote PC called "beomodern".

User simply needs to login to that PC and then copy and paste his favorite

songs in mp3 or flac format into "Player" folder. That is it.

Once songs are there BeoModern will scan this folder and build library to browse thru.
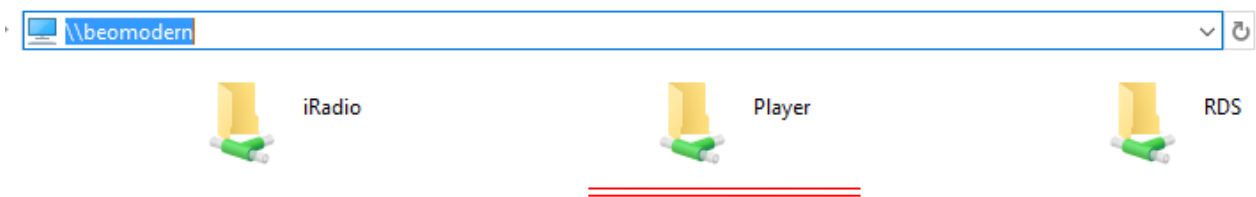
.

Selecting iRadio mode

The BeoModern enables you to listing to your favorite internet radio station. The two things that you will need are internet connection and link to your favorite radio stream. BeoModern will take it from there.

When iRadio is selected BeoModern display on the right side will lit up label: "iRADIO".

When BeoModern acquire internet connection (over WiFI or Ethernet) display on the left side will lit up label: "ONLINE" label.

When live stream is played, BeoModern display will scroll over with radio station name followed by currently played artist and song title (assuming radio station provides those data).

ONLINE   `BBC Radio 1: Pink Floyd`   **iRADIO**

To enable iRadio mode using Beo4, MCP or front panel, follow instructions described below. After a while you will remember that, to put it simply, iRadio is "number 2".

MCP
To power up BeoModern into iRadio state
AUX   Press to select AUX
then:
2   Press 2 to select iRadio
If already MCP is in AUX mode and BeoModern is ON simply
2   Press 2 to switch to iRadio

PANEL
To power up BeoModern into iRadio state press button on the right hand side.
↑
If BeoModern wakes up into different state or if it is already in different state, press button (short press) on the right hand side to toggle its state, until iRadio mode is activated.

BEO4
To power up BeoModern into iRadio state
LIST   Press to select A.AUX
then:
GO   Press GO to activate A.AUX
then:
2   Press 2 to select iRadio
If already Beo4 is in A.AUX mode and BeoModern is ON simply
2   Press 2 to switch to iRadio

Selecting station

The library of Internet Radio stations is stored inside BeoModern. It is simply a list of radio stations that you can browse thru and select one you want to listen to next.

To help you with navigation thru the list of iRadio stations BeoModern will,

- display digit cue with radio station number follow by number of all radio stations on the list and iRadio station name. This is done when user starts to navigate thru radio station list.

ONLINE	15/25 BBC Radio 4	iRADIO

- Once new iRadio station is selected, BeoModern will start to stream audio from it. BeoModern display will present iRadio station name together with currently played band name and song title

ONLINE	BBC Radio 4: Rhiannon	iRADIO

To navigate thru BeoModern iRadio list user should rely on BeoModern display together with remote buttons highlighted below.

MCP
While BeoModern plays your favorite iRadio station and MPC is in AUX mode you can:
PLAY   To tune to selected iRadio station
<< or **< STEP**   Select previous iRadio station from the list
>> or **STEP >**   Select next iRadio station on the list

PANEL
When in iRadio mode, you can change current radio station to the next one by pressing (short press) button on the left hand side.

BEO4
While BeoModern plays your favorite iRadio station and Beo4 is in A.AUX mode you can:
GO   To tune to selected iRadio station
◀◀ or **▲**   Select previous iRadio station from the list
▶▶ or **▼**   Select next iRadio station on the list

Managing station library

The modify Internet Radio station list user will need PC with text editor on it.

When BeoModern connects to local network over WiFi or Ethernet (look at the end of this user guide for technical details on interconnectivity) it will present itself as remote PC called "beomodern".

User needs to login to that PC and then go to folder called "iRadio"

Inside that folder user will find file called *iRadio_stations.txt*
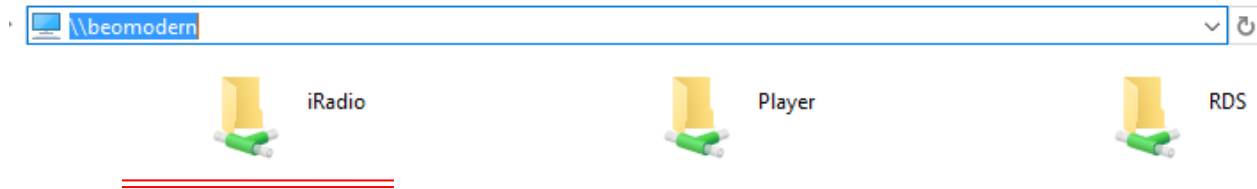
Using *Sublime* or similar text editor, user needs to open *iRadio_stations.txt* file. Adding new internet radio or modifying an existing one is done by adding/altering line:

```
Radio ZET;;http://zet090-02.cdn.eurozet.pl:8404
```

where:

```
displayed_radio_station_name;;internet_radio_station_link
```

A ";;" separator is used between radio station name and radio station link. *Link should be complete with port number if needed.*

Selecting DAB Radio mode

Last few years brought new ways of transmitting radio stations over the air. Digital Audio Broadcasting (DAB) start to replace classic FM stations. BeoModern enables access to those radio stations and as part of keeping BeoSystem up to date with technology.

A radio antenna needs to be connected to BeoModern unit when receiving DAB radio stations. More about it at the end of this user manual.

When DAB Radio is selected BeoModern display on the right side will lit up label: "DAB".

When DAB Radio is played, BeoModern display will scroll over, radio station name followed by currently played artist and song title (assuming radio station provides those data over the air).

```
RTE PULSE: U2 - Numb                    DAB
```

To enable DAB Radio mode using Beo4, MCP or front panel, follow instructions described below. After a while you will remember that, to put it simply, DAB is "number 3".

MCP
To power up BeoModern into DAB Radio state
AUX Press to select AUX
then:
3 Press 3 to select DAB Radio
If already MCP is in AUX mode and BeoModern is ON simply
3 Press 3 to switch to DAB Radio

PANEL
To power up BeoModern into DAB Radio state press button on the right hand side.
↑
If BeoModern wakes up into different state or if it is already in different state, press button (short press) on the right hand side to toggle its state, until DAB Radio mode is activated.

BEO4
To power up BeoModern into DAB Radio state
LIST Press to select A.AUX
then:
GO Press GO to activate A.AUX
then:
3 Press 3 to select DAB Radio
If already Beo4 is in A.AUX mode and BeoModern is ON simply
3 Press 3 to switch to DAB Radio

Selecting station

The list of active DAB Radio stations is stored by BeoModern. It is simply a list of DAB radio stations that user can browse thru and select one he wants to listen to next.

To help user with navigation thru list of DAB Radio stations BeoModern will,

- display digit cue with DAB radio station number follow by number of all radio stations stored in the

unit and station name.

- This is done when user starts to navigate thru radio station list.

```
2/12 RTE Radio 1                           DAB
```

- Once new DAB Radio station is selected, BeoModern will start to

stream audio from it. BeoModern display will present DAB Radio station name and assuming that

radio station provides extra data it will display currently played band name and song title

```
RTE Radio 1                                DAB
```

To navigate thru BeoModern DAB Radio list user should rely on

BeoModern display together with remote buttons highlighted below.

MCP

While BeoModern plays your favorite DAB station and MPC is in AUX mode you can:

PLAY To tune to selected DAB Radio station

<< or **< STEP** Select previous DAB Radio station from the list

>> or **STEP >** Select next DAB Radio station on the list

PANEL

When in DAB mode, you can change current DAB radio station to the next one by pressing (short press) button on the left hand side.

BEO4

While BeoModern plays your favorite DAB station and Beo4 is in A.AUX mode you can:

GO To tune to selected DAB Radio station

◄◄ or **▲** Select previous DAB Radio station from the list

►► or **▼** Select next DAB Radio station on the list

Re-scanning DAB stations

The update DAB Radio station list BeoModern will have to be connected to local network and user will need PC with SSH client software (for example: *PuTTY*).

When BeoModern connects to local network over WiFi or Ethernet (look at the end of this user guide for technical details on interconnectivity) its control interface will be accessible over SSH

connection at port 22.

In order to re-scan DAB Radio stations, user using SSH client such as PuTTY needs to follow sequence outlined below:

1. login into BeoModern (get BeoModern IP from local router)
   over SSH connection (port 22).

   ```
   L: beo
   P: ******
   ```

2. Go to location:

   ```
   /home/beo/BeoModern/DAB
   ```

3. Run:

   ```
   sudo ./DABBoardRadio_v0.16.4
   ```

   scan might start automatically. If not, navigate to "Rescan"
   option and scan radio spectrum. This process will take minute or two.

4. When finished, exit program by pressing 'x'

All DAB Radio stations found by `DABBoardRadio_v0.16.4` software will be automatically available in DAB Radio mode for you to enjoy.

22 Selecting AuxIN mode

Selecting AuxIN mode

If you have a sound source that you want to quickly connect to BeoSystem and listen to it BeoModern helps with that. It provides access to AuxIN input (phono jack / headphones input) on the front panel. Just simply plug Jack cable into connector at the front and switch BeoModern to AuxIN mode.

When AuxIN mode is selected BeoModern display on the right side will lit up label: "AUX IN".

When Aux IN is activated, BeoModern display will display static "Aux IN mode" message.

Aux IN mode   AUX IN

To enable Aux IN mode using Beo4, MCP or front panel, follow instructions described below. After a while you will remember that, to put it simply, Aux IN is "number 4".

MCP
To power up BeoModern into Aux IN state
AUX   Press to select AUX
then:
4   Press 4 to select Aux IN input
If already MCP is in AUX mode and BeoModern is ON simply
4   Press 4 to switch to Aux IN input

PANEL
To power up BeoModern into Aux IN state press button on the right hand side.
If BeoModern wakes up into different state or if it is already in different state, press button (short press) on the right hand side to toggle its state, until Aux IN mode is activated.

BEO4
To power up BeoModern into Aux IN state
LIST   Press to select A.AUX
then:
GO   Press GO to activate A.AUX
then:
4   Press 4 to select Aux IN input
If already Beo4 is in A.AUX mode and BeoModern is ON simply
4   Press 4 to switch to Aux IN input

Selecting Clock

BeoModern is fitted with its own battery assisted real time clock. Thanks to that, it stores and keeps track of date and time. That information can be presented on BeoModern display.

When Clock is selected:

- BeoModern displays clock in format of hours:minutes.seconds and day of the week,

day of the month, month.

- on the right side it will lit up label: "CLOCK".

BeoModern build in clock can be setup up manually by the user. It also periodically listens to DCF (Atomic clock) information transmitted from Mainflingen, Germany. When valid data is received, BeoModern automatically adjusts its internal clock

and "ATOM" label lit up on the left hand side of the display informing user that time is accurate.

Another useful feature that BeoModern offers is automatic power down of whole BeoSystem (sleep timer) after user selected period of time.

| ATOM | 23:51.09   Sun 11 Apr | CLOCK |

To enable Clock mode using Beo4, MCP or front panel, follow instructions described below. After a while you will remember that, to put it simply, Clock is "number 5".

MCP
To power up BeoModern into Clock state
AUX Press to select AUX
then:
5 Press 5 to select Clock
If already MCP is in AUX mode and BeoModern is ON simply
5 Press 5 to switch to Clock

PANEL
To power up BeoModern into Clock state press button on the right hand side.
↑
If BeoModern wakes up into different state or if it is already in different state, press button (short press) on the right hand side to toggle its state, until Clock mode is activated.

BEO4
To power up BeoModern into Clock state
LIST Press to select A.AUX
then:
GO Press GO to activate A.AUX
then:
5 Press 5 to select Clock
If already Beo4 is in A.AUX mode and BeoModern is ON simply
5 Press 5 to switch Clock

Setting the Timer off function

The BeoModern Clock provides user with ability to configure time after which BeoModern will automatically shut down whole BeoSystem.

Auto off Timer (or sleep timer) settings are accessible to the user only when BeoModern is in Clock mode.

Once in Clock mode, user can select

15/30/45/60/90 auto off or disable active timer.

Set Off-Time? OK / Exit   CLOCK

Set Auto-Off in -- min?   CLOCK

Once Auto-Off timer is set, "TIMER" label on the left hand side of the display will lit up.

User can always check remaining ON time and if desire change or cancel it by selecting "--".

TIMER Auto-Off in 14 min   CLOCK

To configure BeoModern Auto-off
Timer settings user should rely on
BeoModern display together with
remote buttons highlighted below.

MCP
While BeoModern is in Clock mode and MPC is in AUX mode you can:

STOP To enter timer off menu

PLAY To enter and accept new timer off settings

< STEP To decrease timer off time

STEP > To increase timer off time

RESET To cancel new timer settings and exit timer menu

PANEL
There is no access to timer settings from front panel.

BEO4
While BeoModern is in Clock mode and Beo4 is in A.AUX mode you can:

STOP To enter timer off menu

GO To enter and accept new timer off settings

▼ To decrease timer off time

▲ To increase timer off time

EXIT To cancel new timer settings and exit timer menu

Setting the built-in clock

The BeoModern Clock provides user with ability to set internal clock time and date values. After data is provided by the user, BeoModern will store it inside and continue counting time even when not powered up, using internal battery assisted clock system.

Clock settings are accessible to the user only when BeoModern is in Clock mode.

Once in Clock mode, user can set hours, minutes, seconds and day, month, year.

Configuring of new time is done by altering value of each digit to new desire one by increasing/decreasing its value. Current position that can be modified is highlighted by blinking action.

```
Set Clock?      OK / Exit        CLOCK
```

```
00:23:51   M04/D15/Y2021         CLOCK
```

Once user is happy with new settings he can press OK/PLAY. New values are immediately applied to BeoModern Clock and stored in internal, battery assisted module.

```
00:23:51   Thu 15 Apr            CLOCK
```

To configure BeoModern Clock settings user should rely on BeoModern display together with remote buttons highlighted below.

MCP

While BeoModern is in Clock mode and MPC is in AUX mode you can:

TURN — To enter clock settings

PLAY — To enter and accept new Clock settings

< STEP — To decrease value of selected digit

STEP > — To increase value of selected digit

<< — To move digit to be modified to the left

>> — To move digit to be modified to the right

RESET — To cancel new timer settings and exit timer menu

PANEL

There is no access to Clock settings from front panel

BEO4

While BeoModern is in Clock mode and Beo4 is in A.AUX mode you can:

MENU — To enter clock settings

GO — To enter and accept new Clock settings

▼ — To decrease value of selected digit

▲ — To increase value of selected digit

◄◄ — To move digit to be modified to the left

►► — To move digit to be modified to the right

EXIT — To cancel new timer settings and exit timer menu

Selecting RDS Info display

The BeoMaster that controls whole BeoSystem handles FM radio reception. With BeoMaster 7000 and BeoLink 7000 it is possible access to RDS data. There is no possibility though to display that data on any of BeoSystem units. BeoModern changes this.

BeoModern when in RDS Info mode intercepts Datalink commands that are sent to BeoMaster to select FM radio station. Based on selected FM station, BeoMaster displays name associated with FM radio station number.

When RDS Info is selected BeoModern display on the right side will lit up label:

"RDS".

BeoModern display with print out FM station name. In the future RDS data can be decoded and displayed.

RTE Lyrics   RDS

To enable RDS Info mode using Beo4, MCP or front panel, follow instructions described below. After a while you will remember that, to put it simply, RDS Info is "number 6".

MCP

To power up BeoModern into RDS Info state user needs to go thru intermediate state of "Clock" mode. This is due to limit of Aux IN systems that are handled by Datalink architecture.

AUX Press to select AUX

then:

5 Press 5 to select Clock

then:

6 Press 6 to select RDS Info

If already MCP is in AUX mode and BeoModern is ON simply

6 Press 6 to switch to RDS Info

PANEL

To power up BeoModern into RDS info state press button on the right hand side.

↑

If BeoModern wakes up into different state or if it is already in different state, press button (short press) on the right hand side to toggle its state, until RDS info mode is activated.

BEO4

To power up BeoModern into RDS Info state user needs to go thru intermediate state of "Clock" mode. This is due to limit of Aux IN systems that are handled by Datalink architecture.

LIST Press to select A.AUX

then:

GO Press GO to activate A.AUX

then:

5 Press 5 to select Clock

then:

6 Press 6 to select RDS Info

If already Beo4 is in A.AUX mode and BeoModern is ON simply

6 Press 6 to switch to RDS Info

Naming radio programs

The way how BeoModern handles FM radio station names is rather simple. It stores a list of FM radio station numbers and their names. When RDS Info state is enabled and BeoModern "sense" FM station number being present on Datalink it reads associated name with FM station number and displays it.

The modify FM station list user will need PC with text editor on it.

When BeoModern connects to local network over WiFi or Ethernet (look at the end of this user guide for technical details on interconnectivity) it will present itself as remote PC called "beomodern".

User needs to login to that PC and then go to folder called "RDS"

Inside that folder user will find file called *RDS_stations.txt*
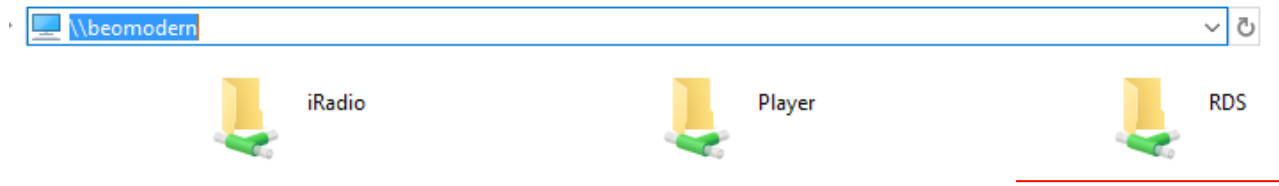
Using Sublime or similar text editor, user needs to open *RDS_stations.txt* file. Adding new FM radio station name or modifying an existing one is done by adding/altering line:

```
1;;104.4;;Clare Hits
```

where:

```
displayed_radio_station_number;;FM_radio_station_frequency[MHz];;name_presented_on_
beomodern_display
```

A ";;" separator is used between radio station number, radio station frequency in MHz (with dot to separate fraction) and radio station Name.

Selecting Bluetooth Receiver mode

BeoModern offers Bluetooth receiver mode. It basically allows you seamlessly stream any music from Bluetooth enable audio sources into BeoSystem.

When BT Rx mode is selected,

BeoModern starts searching for Bluetooth transmitters to pair with. It will display "Bluetooth searching …" message and display on the right side will lit up label: "BT Rx".

On device that user wants to transmit

music from user needs to pair with device named "BT-B20". Once paired correctly (there are not keys or code needed) BeoModern will display "BlueTooth paired" message.

BlueTooth searching …   **BT Rx**

To enable BT Rx mode using Beo4, MCP or front panel, follow instructions

described below. After a while you will remember that, to put it simply, BT Rx is "number 7".

MCP
To power up BeoModern into BT Rx state user needs to go thru intermediate state of "Clock" mode. This is due to limit of Aux systems that are handled by Datalink architecture.

AUX Press to select AUX

then:

5 Press 5 to select Clock

then:

7 Press 7 to select BT Rx mode

If already MCP is in AUX mode and BeoModern is ON simply

7 Press 7 to switch to BT Rx mode

PANEL
To power up BeoModern into BT Rx state press button on the right hand side.

↑

If BeoModern wakes up into different state or if it is already in different state, press button (short press) on the right hand side to toggle its state, until BT Rx mode is activated.

BEO4
To power up BeoModern into BT Rx state user needs to go thru intermediate state of "Clock" mode. This is due to limit of Aux systems that are handled by Datalink architecture.

LIST Press to select A.AUX

then:

GO Press GO to activate A.AUX

then:

5 Press 5 to select Clock

then:

7 Press 7 to select BT Rx mode

If already Beo4 is in A.AUX mode and BeoModern is ON simply

7 Press 7 to switch to BT Rx mode

Operating Bluetooth Receiver

Once your BT device is paired with BeoModern, you can start playing your favorite music. When you start song, BeoModern will receive and play audio. It will also display current BT standard. BT Rx supports following audio codecs:

- aptX HD
- aptX Low Latency
- aptX
- SBC
- AAC

When song is being played user can pause or resume it using MCP/Beo4. Changing song to next or previous one in playlist is also supported

BlueTooth connected   BT Rx

BlueTooth aptX HD codec   BT Rx

BeoModern will store list of last 5 devices it paired with over BT Rx. User can clear that list at any moment. It is also possible to re-connect to last paired device or to start pairing process with new BT device.

BT Pairing search BT-B20   BT Rx

BlueTooth clearing …   BT Rx

To operate BT Rx mode using Beo4,
MCP or front panel, follow instructions
described below.

MCP

While BeoModern is in BT Rx mode and MPC is in AUX mode you can:

STOP To re-connect with last BT device

PLAY To pause/resume currently played song

< STEP
or
<< To move to previous song in the playlist

STEP >
or
>> To move to next song in the playlist

TURN To start pairing process
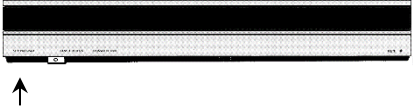
RESET To clear all recorded BT devices

PANEL

While BeoModern is in BT Rx state short press of the button on the left hand side will start re-connecting/pairing process.

BEO4

While BeoModern is in BT Rx mode and Beo4 is in A.AUX mode you can:

STOP To re-connect with last BT device

GO To pause/resume currently played song

▼
or
◀◀ To move to previous song in the playlist

▲
or
▶▶ To move to next song in the playlist

MENU To start pairing process

EXIT To clear all recorded BT devices

Selecting Bluetooth Transmitter mode

BeoModern offers Bluetooth transmitter mode. It basically allows user to listen to any BeoSystem audio source (any BeoModern mode or BeoSystem tape/CD/LP/FM_radio) using Bluetooth enabled headphones or portable speaker.

When BT Tx mode is selected, display on the left side will lit up label: "BT Tx". BeoModern then starts pairing process. If BT devices was paired with BeoModern before, entering BT Tx state triggers searching for it.

When BT Tx mode is enabled,

BeoModern will identify itself as "BT-B20" device. Once paired correctly (there are not keys or code needed) BeoModern will display "BlueTooth paired" message

BT Tx   BlueTooth searching …

To enable BT Tx mode using Beo4, MCP or front panel, follow instructions

described below. After a while you will remember that, to put it simply, BT Tx is "number 8".

MCP
To power up BeoModern into BT Tx state user needs to go thru intermediate state of "Clock" mode. This is due to limit of Aux systems that are handled by Datalink architecture.
AUX   Press to select AUX
then:
5   Press 5 to select Clock
then:
8   Press 8 to select BT Tx mode
If already MCP is in AUX mode and BeoModern is ON simply
8   Press 8 to switch to BT Tx mode

PANEL
To power up BeoModern into BT Tx state press button on the right hand side.
↑
If BeoModern wakes up into different state or if it is already in different state, press button (short press) on the right hand side to toggle its state, until BT Tx mode is activated.

BEO4
To power up BeoModern into BT Tx state user needs to go thru intermediate state of "Clock" mode. This is due to limit of Aux systems that are handled by Datalink architecture.
LIST   Press to select A.AUX
then:
GO   Press GO to activate A.AUX
then:
5   Press 5 to select Clock
then:
8   Press 8 to select BT Tx mode
If already Beo4 is in A.AUX mode and BeoModern is ON simply
8   Press 8 to switch to BT Tx mode

Operating Bluetooth Transmitter

Once your BT receiver device (headphones, speaker) is paired with BeoModern, you can start listening to BeoCenter music. Note that volume level is controlled by BT receiver device (headphones or speaker) and not by BeoSystem any mode. When connection is established, display will

print current BT standard. BT Tx supports:

- aptX HD
- aptX Low Latency
- aptX
- SBC

When song is being played user can

pause or resume it using MCP/Beo4.

If connection is not established, BT Tx will go into sleep state after a while. Display will inform user if that is the case. User can re-connect to BT receiver at any time.

BT Tx	BlueTooth connected

BT Tx	BlueTooth aptX HD codec

BeoModern will store list of last 5 devices it paired to over BT Tx. User can clear that list at any moment.

Clearing process takes few seconds to finish.

It is also possible to trigger re-connect

to last paired device or to start pairing process with new BT receiver device.

BT Tx	BT Pairing - name BT-B20

BT Tx	BlueTooth mute audio

BT Tx	BlueTooth clearing …

To operate BT Tx mode using Beo4,
MCP or front panel, follow instructions
described below.

MCP

While BeoModern is in BT Tx mode and MPC is in
AUX mode you can:

STOP   To re-connect with last BT device

PLAY   Mute/un-mute BT Tx output

TURN   To start pairing process

RESET   To clear all recorded BT Tx
devices

PANEL

While BeoModern is in BT Tx state short press of
the button on the left hand side will start
re-connecting/pairing process.

↑

BEO4

While BeoModern is in BT Tx mode and Beo4 is in
A.AUX mode you can:

STOP   To re-connect with last BT device

GO   Mute/un-mute BT Tx output

MENU   To start pairing process

EXIT   To clear all recorded BT Tx
devices

Switching display modes

BeoModern comes with versatile 24 digit alphanumeric display. The display is used to inform user about currently played tracks, radio stations, modes of operation but it can do more.

In any mode of BeoModern operation display can be switched to one of its seven states:

1. State info (song title, radio station name, artist, BT modes, etc.)

2. Signal level that presents signal levels on left and right channels with 0dB, +3dB and +6dB indicated as squares.

   a. "LEVEL" label lit up left hand side

3. Signal envelope tracker displaying peaks of incoming signal spectrums on left and right channels in 10 bands and in 14 levels.

   a. "PEAK" label lit up on left hand side

4. Spectrum analyzer that shows left and right channels signal spectrums in 10 bands and in 8 levels.

   a. "SPECTR" label lit up on left hand side

5. Clock

6. Clock and date

7. Blank – alphanumeric display is off and only left and right label displays stays lit up.

Diagrams below shows different display stated. Player mode with BT Tx enabled was used as an example.

1.

| BT Tx | Jesca Hoop - When I'm 139 | PLAYER |

2.

| BT Tx
LEVEL | L ... | R ... | PLAYER |

3.

| BT Tx
PEAK | L ⌢ R ⌢ | PLAYER |

4.

| BT Tx
SPECTR | L R | PLAYER |

5.

| BT Tx | 23:19 | PLAYER |

6.

| BT Tx | 23:19.51 Wed 14 Apr | PLAYER |

7.

| BT Tx | | PLAYER |

To select BeoModern display mode
using Beo4, MCP or front panel, follow
instructions described below.

MCP
When BeoModern is already ON and MCP is in AUX mode:

DISPLAY   Switching display mode to its next state

PANEL
While BeoModern is ON, long press button on the left hand side will toggle display mode.

BEO4
When BeoModern is already ON and Beo4 is in A.AUX mode.

Switching display mode to its previous state

Switching display mode to its next state

Interconnectivity

BeoModern is designed to work as a part of BeoSystem setup. It utilize BeoMaster as a its control unit. Interaction between BeoMaster and BeoModern is done over Datalink interface which is part of most of BeoMaster and BeoCenters systems. That means, BeoModern can work with any systems that provides access to Datalink interface.

An analog audio signals (stereo inputs and outputs) together with datalink are available on standard DIN 7 pin connector that can be found at the back of BeoModern unit.

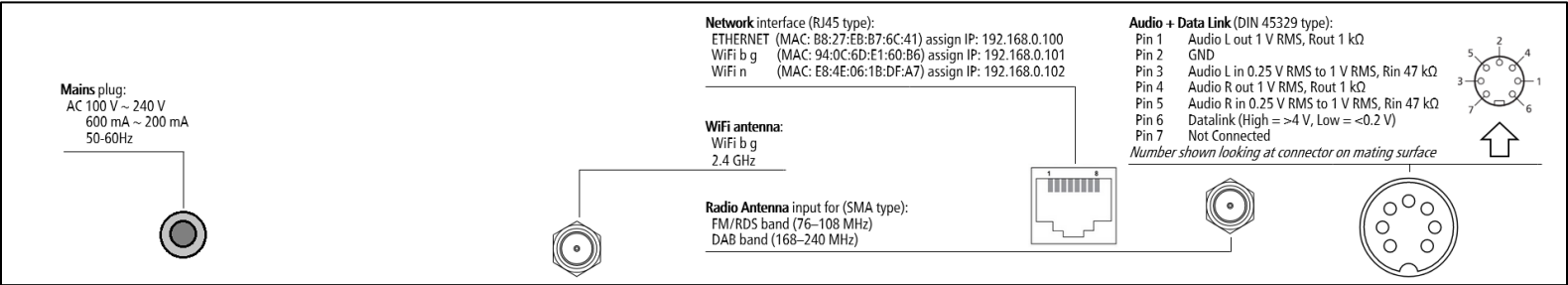Three other connectors there are:

- RJ45 Ethernet port – to connect to local internet network

- SMA connector for antenna used

by WiFi b/g modem.

- SMA connector for DAB radio antenna

Unit can accept any mains power voltage available worldwide.

Diagram below (copy of diagram installed in the BeoModern unit) outline all interconnectivity details.

Mains plug:
AC 100 V ~ 240 V
600 mA ~ 200 mA
50-60Hz

Radio Antenna input for (SMA type):
FM/RDS band (76–108 MHz)
DAB band (168–240 MHz)

WiFi antenna:
WiFi b g
2.4 GHz

Network interface (RJ45 type):
ETHERNET (MAC: B8:27:EB:B7:6C:41) assign IP: 192.168.0.100
WiFi b g (MAC: 94:0C:6D:E1:60:B6) assign IP: 192.168.0.101
WiFi n (MAC: E8:4E:06:1B:DF:A7) assign IP: 192.168.0.102

Audio + Data Link (DIN 45329 type):
Pin 1   Audio L out 1 V RMS, Rout 1 kΩ
Pin 2   GND
Pin 3   Audio L in 0.25 V RMS to 1 V RMS, Rin 47 kΩ
Pin 4   Audio R out 1 V RMS, Rout 1 kΩ
Pin 5   Audio R in 0.25 V RMS to 1 V RMS, Rin 47 kΩ
Pin 6   Datalink (High = >4 V, Low = <0.2 V)
Pin 7   Not Connected
Number shown looking at connector on mating surface

On the top of physical connections that can be found at the back, BeoModern also supports number of build in RF antennas. They are located behind unit front panel and

support:

- Bluetooth interface

- WiFi n protocol

- DCF clock signal receiver

There is nothing special that user

needs to do here other than be aware about those antennas and if possible avoid putting metal shields that could cover front panel.

Network settings

In order for BeoModern:

1. player to provide access to its libraries from PC unit will need access to local network

2. internet Radio to work, unit will need access to internet.

BeoModern comes equipped with three ways to connect to local network or internet. It supports:

- WiFi b/g standard that works at 2.4GHz frequency band.

- WiFi n standard that works at 5GHz frequency band

- Ethernet that supports 10/100 Mbit/s speed

BeoModerns is configured to support, DHCP protocol. For ease of operation it is suggested to setup local router to automatically assign following IP addresses:

- WiFi b/g (MAC: 94:0C:6D:E1:60:B6) assign IP: 192.168.0.101

- WiFi n (MAC: E8:4E:06:1B:DF:A7) assign IP: 192.168.0.102

- Ethernet (MAC: B8:27:EB:B7:6C:41) assign IP: 192.168.0.100

If there are issues with network setup, user should manually login into RPi (a USB keyboard and monitor with HDMI connector will be needed) and executer:

sudo raspi-config

Select the Network Options item from the menu, then the Wi-fi option. For more info go to: *https://www.raspberrypi.org/documentation/configuration/wireless/wireless-cli.md*

Once IP addresses are established you can SSH into BeoModern (RPi) using for example PuTTY software.

Using PuTTY connect over SSH protocol to port 22. Use: L/P: *beo / modern* credentials.

Politeness

When BeoModern powers up into Player, iRadio, DAB or RDS states it needs few seconds to start. When any of states mentioned above are called, a display will light up with greeting message that is tailored accordingl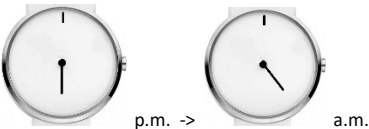y to current time of the day. There is also simple counter displayed with number of remaining seconds to full operation. Diagrams blow provides an overview it.

a.m. ->   p.m.

Good morning   05

p.m. ->   p.m.

Good afternoon   30

p.m. ->   a.m.
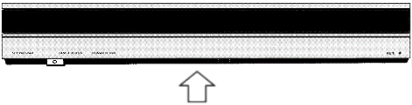
Good evening   14

BeoModern unit can find itself working in different light condition. Since its display plays important role in overall operation, unit is fitted with automatic brightness adjustment. A photocell is placed underneath front panel (in the middle section).

Photocell eye is exposed to ambient light.

- If outside conditions are dark, unit will automatically dim its front

panel display.

- If outside conditions are bright, unit will automatically increase front panel display brightness.

There are 6 different display brightness level of which unit will automatically select relevant one.

Kraftwerk - Model   93   PLAYER

Kraftwerk - Model   51   PLAYER

Since BeoModer reacts to standard Beo4 commands and interacts with BeoMaster using Datalink interface, it

can basically interoperate with any BeoMaster or BeoSystems fitted with Datalink. User can also customize Beo5/6 type remote controllers

interface to control BeoModern in more seamless and convenient way.

BeoModern offers multiple modes of operation. When you are done with the system for the day and switch it off, unit will remember its latest settings. This include its mode of operation and state of display.

In case when you listen to your favorite song on Player and suddenly realize you want to hear latest news, you can switch to them immediately. Upon your return, back to Player mode, BeoModern will return to exact the

same song and to exact the same song position where you left it last time. All of that is done seamlessly and there is no need to search anything.

Analog

Input level	0.25 V RMS to 1 V RMS, Rin 47 kΩ
Output level	1 V RMS, Rout 1 kΩ
Audio codec	AD1938
Dynamic range	107 dB ADC dynamic range and SNR
	108 dB DAC dynamic range and SNR
Distortion	−94 dB THD + N

Digital

DSP processor	SigmaSDP ADAU1452
Sample rate	96kHz, Internal Asynchronous Sample Rate Converters are utilized to cross sample domains
Bluetooth interface to DSP	S/PDIF 24bits / 48kHz
DAB Radio to DSP	I2S
Player/iRadio to DSP	I2S with songs or radio station native sampling rates

Interconnectivity

Bluetooth Rx	Version 5.0 (4.2 compliant)
	Supported codecs:
	- aptX HD (24bits, 48kHz, max 576 kbps)
	- aptX Low Latency (16bits, 44.1kHz, max 352 kbps)
	- aptX (16bits, 48kHz, max 384 kbps)
	- SBC (sub-band coding, 16bits, 48kHz, max 256 kbps)
	- AAC (advanced audio coding, 16 bits, 44.1kHz, max 264 kbps)
Bluetooth Tx	Version 5.0 (4.2 compliant)
	Supported codecs:
	- aptX HD (24bits, 48kHz, max 576 kbps)
	- aptX Low Latency (16bits, 44.1kHz, max 352 kbps)
	- aptX (16bits, 48kHz, max 384 kbps)
	- SBC (sub-band coding, 16bits, 48kHz, max 256 kbps)
Ethernet	RJ45 connector
	10/100 Mbit/s
	MAC: B8:27:EB:B7:6C:41 (suggested to assign IP: 192.168.0.100)
WiFi b/g	SMA connector for external antenna
	2.4GHz frequency band
	MAC: 94:0C:6D:E1:60:B6 (suggested to assign IP: 192.168.0.101)
WiFi n	Internal antenna
	5GHz frequency band
	MAC: E8:4E:06:1B:DF:A7 (suggested to assign IP: 192.168.0.102)
Radio tuner	External antenna
	FM/RDS band (76–108 MHz)
	DAB band (168–240 MHz)

DCF atomic clock	Internal antenna
	Frequency: 77.5kHz
	Tuned to receive data from transmitter location at Mainflingen, Germany
Datalink interface	High = >4 V, Low = <0.2 V
	Link compatibility: Master Control Link

Power

Input mains voltage	100 V ~ 240 V
Main current consumption	600 mA ~ 200 mA
Frequency	50-60Hz
standby	0.5 W
maximum	25 W

Mechanical

Connectors	Aux IN – jack type
	DAB antenna – SMA type
	WiFi b/g – SMA type
	Network – RJ45 type
	Audio + Datalink – DIN7, 45329 type
	Mains – UK Plug
dimension	W x H x D: 42 x 7.5 x 32.5cm
weight	5 kg