

5 The HomeAssistant®

Used in conjunction with *EIB*, the HomeAssistant is an effective building management system for private homes. It allows the functions in the home to be operated, managed and controlled easily and reliably. It will also be possible in the future to use it for redefining parameterisations (see Fig. 5-1).
It is an open “software platform” which can be constantly extended with new applications from various manufacturers. The applications listed here represent the current status.

HomeAssistant
Pre-para-
meterisation



Any device that is compatible with and can be controlled by the HomeAssistant can carry the registered trademark.

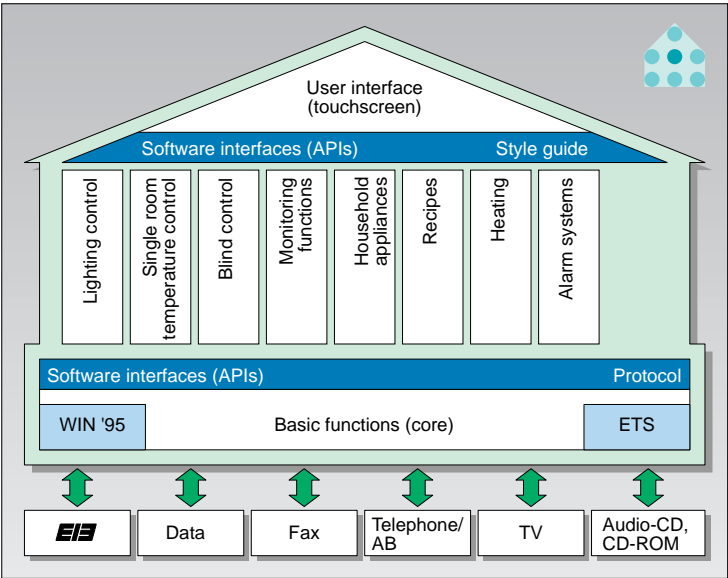


Fig. 5-1 Management functions of the HomeAssistant

Touchscreen
Multimedia
services
Communica-
tion services

Standard oper-
ating system

Mouse click

The HomeAssistant represents the central operating element of the system and is a software package for a multimedia PC with a touch-sensitive screen and mouse operation. It can be situated in any desired location within the house (e.g. kitchen or hallway, etc.). It also represents the connection to multimedia and communication services.

This software, which is capable of controlling a wide variety of applications, is based on a standard operating system and has a user-friendly interface, which is both easy to understand and operate even for inexperienced users. By simply touching the buttons represented on the screen (see Fig. 5-2) or activating them with a mouse click, the HomeAssistant makes it possible to interactively control all functions within the home, in addition to the normal manual activation of the devices.

The decentralised structure of the EIB is not affected by the

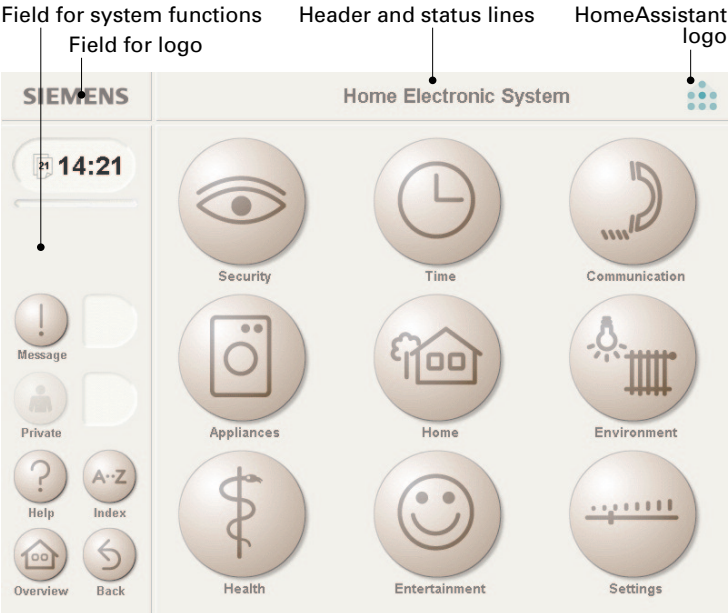


Fig. 5-2 HomeAssistant screen showing the touch-sensitive keys

use of a HomeAssistant. Using a HomeAssistant increases the possibilities of using the EIB devices. It can work with the transmission media described in chapters 2, 3 and 4. The following chapters describe the basic principles of the HomeAssistant and the requirements on the hardware.

5.1 The structure of the HomeAssistant

The HomeAssistant (see Fig. 5-3) consists of

- operating and base systems
- software for the user interface and
- application software.

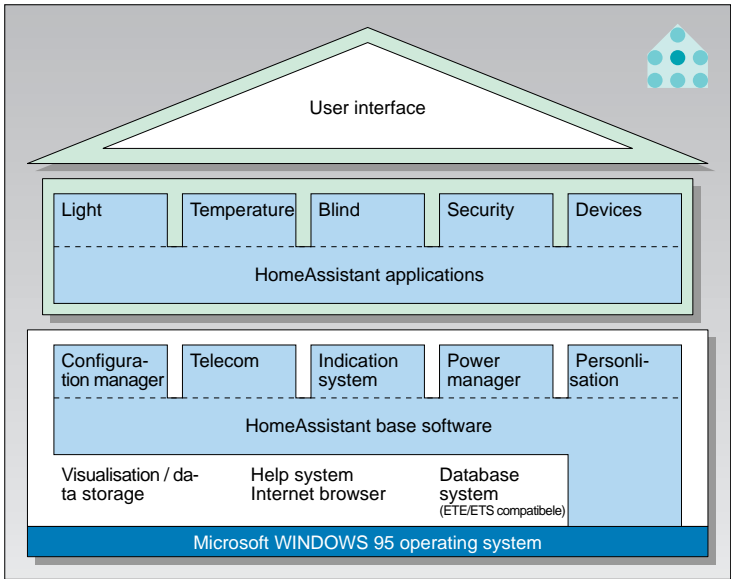


Fig. 5-3 Structure of the HomeAssistant



5.1.1 Operating system and base system

Microsoft
WINDOWS 95

The software can be run on standard PCs with the Microsoft WINDOWS 95 operating system. The base system contains all functions that are necessary for connecting the HomeAssistant to the *EIB* and the operating system and offers interfaces and functions which facilitate the simple integration of applications. Communication with the *EIB* occurs via the known RS 232 interface. The modules of the operating and base systems are described below.

RS 232
interface

5.1.1.1 Visualisation and data management module

Style guide

All outputs on the screen are made possible via the visualisation components. Interface elements are offered which correspond to the HomeAssistant style guide (see chapter 5.1.2.2) and which execute control via the masks. For the applications, the modules for the data management form the interface to the process values in *EIB*. The current status is stored in the data manager for each individual *EIB* device. The applications can also use the data management for the storage of their own data.

5.1.1.2 HomeAssistant database

HomeAssistant
Tool Software

Information that is supplementary to the data contained in the ETS 2 database is needed to configure the HomeAssistant, set up the operating pages and list the controllable devices. In order to record this data with a dialogue program compatible with WINDOWS 95 and to ensure that it is consistent with ETS, the HomeAssistant Tool Software (HTS) is supplied with the HomeAssistant base system. Because a deep knowledge of both *EIB* and the HomeAssistant is required by anyone wishing to use this software, specialised training is offered to both installers and planners.



5.1.1.3 Help system

The help system can be activated via the specified "Help" field. The user is shown context-sensitive information which helps him better understand the system and thereby eliminates the need for a separate instruction manual. Help texts are stored in the usual Internet format (HTML). They can be supplemented with multimedia elements, such as video and voice. Thanks to the chosen format, all essential requirements for updating via the Internet are met.

Help system
Context-
sensitive help

Internet

5.1.1.4 Configuration manager

Conventional visualisation systems are configured by experts to be user specific. One of the greatest advantages of the HomeAssistant is the largely automatic configuration. This saves time and money and for the first time allows the use of "visualisation" in the residential sector. The configuration manager automatically creates masks and variables based on the database, which is stored in the HomeAssistant.

Mask
Variable

5.1.1.5 Telecommunication

Communication with external bus devices is managed in the HomeAssistant by a standard communication layer. With this interface users are able to use telecommunication services and also to remotely control them from outside.

Remote control

5.1.1.6 Indication system

The indication system provides functions for displaying and indicating certain system events. These system events include alarm messages, emergency calls, operating and fault messages for devices.

Indication
system
System event

	5.1.1.7 Power manager and time/logic module
Power manager	The power manager controls the proper start-up and shut-down processes for the system. A special module of the power manager, the time/logic module, provides functions for controlling time programs and event reactions. In order to guarantee that these applications are independent of the running PC operation, external event elements can be used.
System start-up	
System shutdown	
	5.1.1.8 Personalising the HomeAssistant
	In general, the various members of a family will use the HomeAssistant for different things. A personalisation module is provided to cater for this.
	5.1.2 User interface software
	5.1.2.1 Organisation of the screen
	The user interface is geared for use with a touch-sensitive screen. It is divided into four areas (see Fig. 5-2). The following functions are assigned to these four screen areas:
Logo field	Logo field The logo field is intended for the display of the company logo and offers EIB partners the opportunity of displaying their own logos.
Header line	Header line with integrated status line The header line contains the name of the currently displayed screen page.
Status line	The status line is a part of the header line and can be used for short explanations or advice.

System function column	The system function column has an operating and display area and comprises all functions that the HomeAssistant makes available to all applications.	System function column
Working area	The working area is used to place the operating and display elements required by each of the applications. In addition, this area is also used by systems that are independent of the actual application such as the help system, the indication system or the keyword index system. The application-specific function bar is situated in the lower part of the working area. The task of this group of elements is to provide a standardised set of functions that defines the user functions common to all applications.	Working area
5.1.2.2 Operating and display elements	Various operating and display elements are arranged in the individual screen areas, and together they are termed the screen mask or “mask” for short. The operating and display elements of the individual masks should follow a style guide that is the same for all applications. The “style guide” is a set of rules for representing the symbols and writing on the screen. By touching the symbols on the touch-sensitive screen further steps are offered according to ergonomically based rules and intuition.	
5.1.2.2.1 System function column	The operating and display elements of the system function column have the following meaning and function:	
Time and date display	The current time and date that are displayed here are sup-	

plied by the system and are valid for all devices and device groups attached to the HomeAssistant.

Progress display

This display gives the user an overview of the duration of lengthy processes. During these times, the HomeAssistant is generally inoperative.

The advice and message system

The “Advice” function consists of a display field and an operating element. If there are any messages, the corresponding category is indicated in the display field. After pressing the “Advice” button the user is shown further helpful information (What must I do now? What is the correct procedure?). The messages are ordered according to priority – high (red), middle (yellow) and low (blue) and cause different reactions in the system when they occur. The display field always indicates the category of the message with the highest priority.

The “Private” button (personal operating mask)

This button is planned for the future expansion of the HomeAssistant. After pressing this button the user is transferred to a menu in which he can enter or find his favourite functions. Functions for access control are also provided on the mask that appears. These functions allow the user to limit access to “private” data. In the display field attached it is possible to incorporate pictographs or other graphics (e.g. bitmaps) which act as ‘pictorial’ identification of the user.

The “Help” button

The help system offers context-sensitive information on using the current mask and where appropriate offers background information by means of hyperlinks.

Message
priority

Pictograph
Bitmap

Hyperlinks

The “Search” button (keyword index)

The keyword index that is integrated into the HomeAssistant provides alternative access to the system. After finding the desired term in the keyword index it is possible to jump directly to the corresponding mask with the desired application function.

Keyword index

The “Overview” button

It is necessary to differentiate between the following representations and functions:



Fig. 5A Overview button in the introductory mask

Representation 1:
The HomeAssistant is in the “Overview” introductory mask. After pressing this single button, the user is switched to a mask, which displays the status of the house or flat (windows, lighting, etc.). This display is an essential part of the monitoring function. From this mask, it is possible to jump to other more detailed display masks.

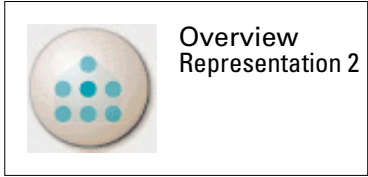


Fig. 5B Overview button in all other masks

Representation 2:
The HomeAssistant is not in the “Overview” introductory mask. If you press this button you are always returned to the “Overview” introductory mask.

The “Return” button

“Return” is a navigational element. After pressing this key the user is always returned to the mask that precedes the

Navigational
element

mask currently displayed. This process is independent of whether the last mask was a normal application mask, a mask from the help system or message system.

5.1.2.2.2 Working area

Operating and display elements

The operating and display elements of the working area have the following function and meaning:

The "Overview" introductory mask and with that access to the system has a permanent arrangement and representation, i.e. the look of the mask remains unchanged even if further applications are added to the HomeAssistant by an installation process.

These operating elements are also based on the "style guide". The captions are selected so that the user can always find or retrieve them in the HomeAssistant despite different associations and methods of approach to a device or sub-function of a device.

The terms of the introductory mask and associated applications are explained in the following sections.

The "Security" operating element

Pressing this button displays the "Security" operating mask, which offers functions generally associated with the term "security".

Possible applications include:

- The external protection of a house and garden.
- The simulation of an occupied house when the occupants are absent.
- Emergency equipment, such as for example the reporting of events to selectable addresses, the activation of alarm systems and checks.
- Etc.

The "Dates" operating element

Pressing this button transfers the user to the "Dates" oper-

ating mask. This mask offers applications whose functions are associated with the term "dates".

Examples include:

- Summer/winter changeover for all devices connected to the system.
- Displaying a world clock.
- Etc.

The "Communication" operating element

After pressing this button the user is transferred to the "Communication" mask. This mask contains applications that are concerned with the use of communication devices. This could for example, include:

- Emergency calls (direct dialling of important telephone numbers).
- Internet access.
- Addressing and text inputs for pagers.

The "Devices" operating element

After pressing this button, the "Devices" mask displays the devices and appliances that are connected to the system.

This could include for example:

- Lighting.
- Shutters.
- Heating/air conditioning systems.
- Communication devices.
- Switchable sockets.
- Household appliances.
- Meters.

Remarks:

At this point the sockets must be offered as a device class, as various consumers can be connected to them.

The “House/Flat” operating element

After pressing this button, a representation is displayed showing where in the house or on the ground plan a certain operating element of the system is located.

If the number of rooms (sites) exceeds nine, a mask with extra operating elements is created automatically.

The “Light/Heat” operating element

After pressing this button all applications associated with either the lighting or temperature are displayed.

Examples include:

- Setting the room temperature for the different rooms.
- Switching the lights in the individual rooms.
- Operating and adjusting the shutters.

The “Health” operating element

Pressing this button displays all applications loosely associated with the health and well being of the occupants. It also includes however, other applications or functions, which facilitate the rapid discovery of help in emergency situations. Possible applications include:

- Emergency calling.
- Health advice.
- Home diagnosis equipment.

The “Entertainment/CD” operating element

This displays all applications that are broadly associated with entertainment.

This button also allows for example, optional access to the TV functions (requires a TV card).

The “System Settings” operating element

Behind this button there is a mask with system functions such as for example, the “Scenario Manager” which can execute global switching processes.

Scenario

Examples:

Measures for system extension, switching off the HomeAssistant, configuring a scenario.

5.1.2.3 Operating logic / menu structure

Touching an operating element in a mask logically switches to the next mask and with that takes you a further step towards your goal. This type of operation is termed logical. It facilitates simple usage of the system. Basically, the desired target can be reached by the user in a number of logical steps. By following the offered operating functions, the user will achieve the desired effect without having to learn or note anything in particular.

Operating logic

The menus of the HomeAssistant are arranged in a tree structure and can be divided into two main areas:

Menu structure

- the **system area** and
- the **application area**.

System area

The system area of the HomeAssistant menu tree is composed exclusively of distribution masks. Within the system area, the path along which an application can be reached and the mask into which the application branches are established.

System area

Application area

Rules are established to achieve standardised accesses to the individual applications.

The menu tree of the application area is composed of both distribution masks and operating masks.

- The distribution masks serve to divide the application into function groups or individual functions that can be selected from here.
- The actual functions of the application are then listed in the operating masks.

Functions and function groups

In order to illustrate the step-wise sequence of the operational logic, the following representation shows a few operational masks and a typical process (see Fig. 5-5).
From the “Overview” starting point, the first step is pressing the “House/Flat” button after which the user is transferred to the “House/Flat” mask. This shows all rooms in the house. If the user now presses the “Kitchen” button within this mask, all devices in this room that are connected to the *EIB* are displayed.

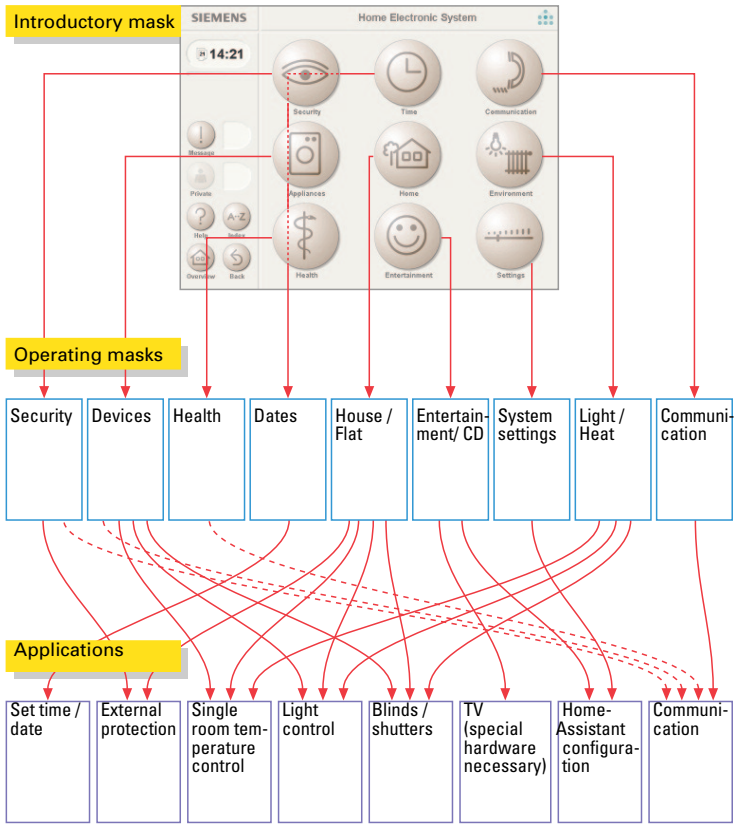


Fig. 5-4 The menu structure of the HomeAssistant

If the user selects “Dishwasher” in the next step, the dishwasher mask is displayed and the user can now set this machine.
The same goal could have been reached by selecting the “Devices” field in the “Overview” mask, which displays all

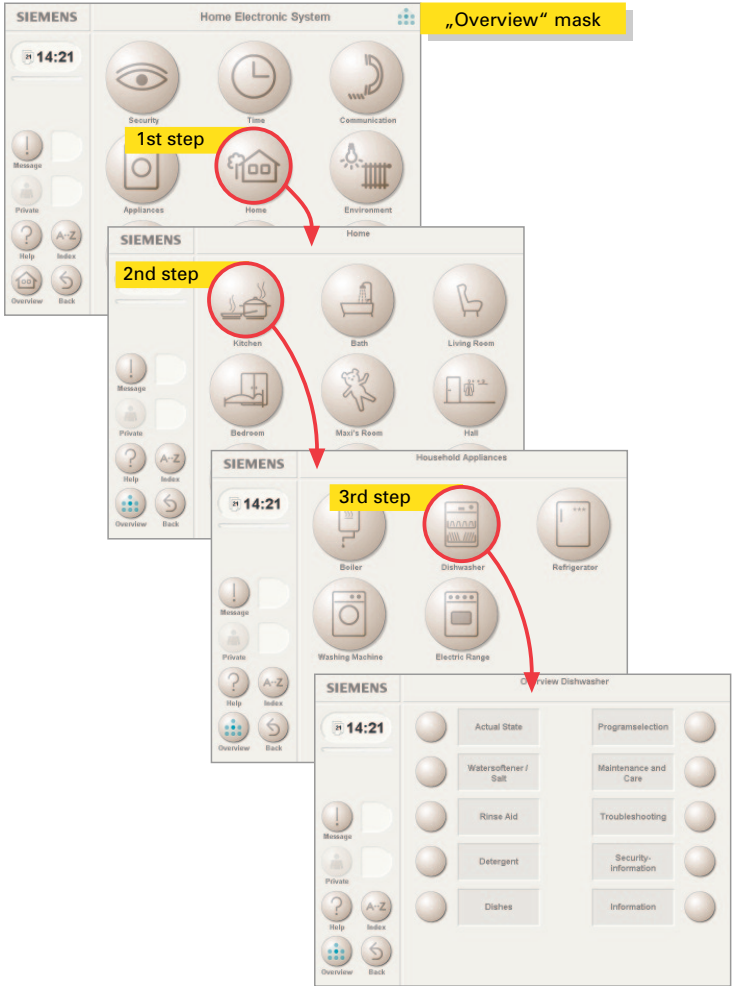


Fig. 5-5 Sequence from “Overview” to “Dishwasher” via “Kitchen”

devices connected to the *EIB*, and then selecting the dishwasher (see Fig. 5-6). This ambiguity in the selection process has been chosen intentionally to allow intuitive, barrier-free access to the system.

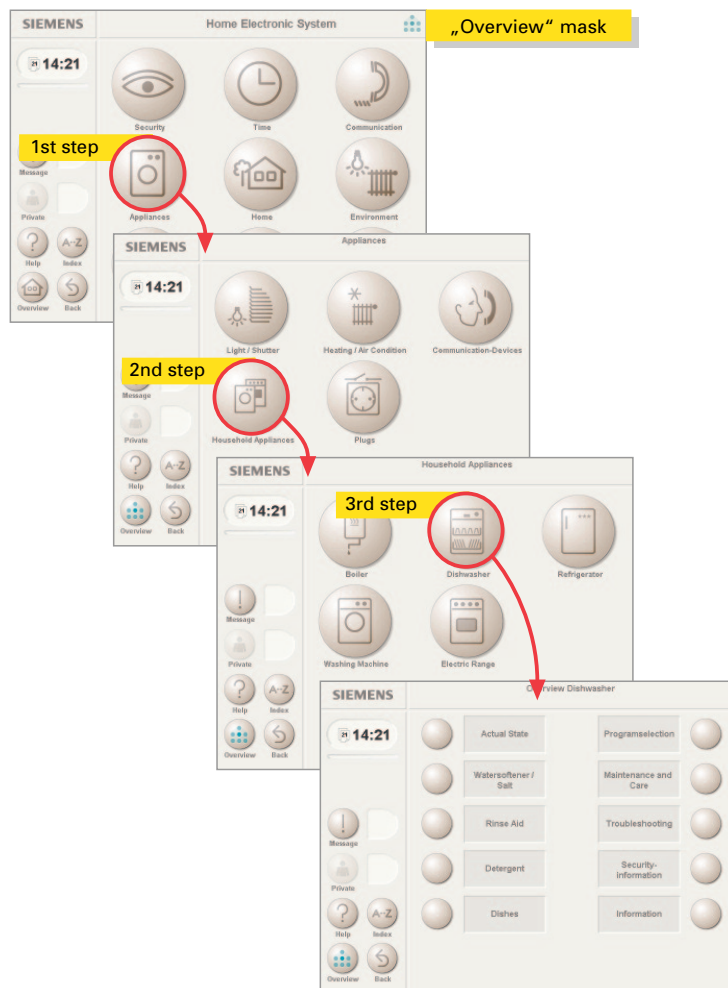


Fig. 5-6 Sequence from "Overview" to "Dishwasher via "Devices"

5.2 Planning

The operational and base system on the one hand (see chapter 5.1.1) and the style guide on the other hand (see chapter 5.1.2.2) make up the foundation for the inclusion of the various applications in residential buildings. The operating and base system is designed as an open software platform.

The numerous different functions are grouped together in packages called applications and can be integrated into the HomeAssistant in any sequence and number. It goes without saying that the *EIB* components and devices necessary for the individual applications must be installed.

These applications are supplied by various EIBA manufacturers. The necessary documentation and software tools are available to create the corresponding application software.

As an example, we have included short descriptions of some of the application packages available today.

5.2.1 Lighting / scenario manager

The lighting application with built-in scenario manager can visualise and operate all lights connected to the *EIB* according to their statuses. Ordering according to room simplifies the process of finding individual lights.

With the scenario manager it is possible to put together sequences for various actions and with that to organise different scenes.

In the dialogue, the user selects the devices that are to be included in a particular scene. These are accepted into the scene with their current status. After this, the call-up criteria are established. The scenes can be invoked in a time or event controlled way.

5.2.2 Heating / temperature

The single room temperature control offers a comfortable means of entering the various time-temperature profiles. Every room can be polled for its current temperature. The settings can be made according to the various “day types” which allows the simple adaptation to weekdays, weekends, flexible working times, holidays as well as personal living routines. These day types can also be used for the control of other devices and device groups, such as for example, blinds.

5.2.3 Blinds / shutters

This application offers functions for blinds and shutters that are analogous to those described for lighting applications. If the lighting application is installed, the blinds and shutters can also be operated with the scenario manager.

5.2.4 Security / monitoring function

The “monitoring function” application contributes to the overall concept of security. This application facilitates a display of security-relevant status information, such as for example:

- Window sensors
- Movement detectors
- Switchable sockets.

5.2.5 Television functions

This comprises the complete functional range of a stereo television with additional functions such as full screen / split screen representations, video channel, transmitter selection in single stages, etc. A pre-requisite is a TV card in the PC.

5.2.6 Extensions via a communication socket

Beyond the standard connection of devices to the *EIB*, connection via a communication socket offers the following additional advantages:

*Communi-
cation socket*

- The communication socket can be commissioned with the ETS 2 without any knowledge of the device to be connected.
- The HomeAssistant automatically adds the device connected to the communication socket to the existent *EIB* system by means of the device specific CD-ROM. This is a possible way of separating different building disciplines and areas of responsibility.
- In the future, devices once registered via a communication socket will be instantly recognisable if connected to a different communication socket within the same *EIB* system (“connection of portable devices”).

One communication socket should be provided for every bus compatible household appliance.

5.2.7 Other applications

As the HomeAssistant represents an open software platform, applications from different manufacturers can be incorporated into the system.

These manufacturers provide both the development tools and the corresponding documentation for developing applications.

5.3 Project design

When designing an *EIB* project with an integrated HomeAssistant, the following points must be observed in addition to the measures already listed in chapters 2.5 and 3.3:

5.3.1 Hardware for the HomeAssistant

The scope and complexity of the HomeAssistant software demands the hardware components listed in Table 5-1 below.

Personal computer (PC):	
Type	IBM AT compatible
Processor type	Pentium ≥ 100 MHz
Memory	≥ 32 MB
Hard disk, free memory	≥ 500 MB
Disk drive	1.44 MB; 3.5"
CD-ROM drive	≥ 4-way speed
Graphic card	800 x 600 pixels, 64 k colours, ≥ 70 Hz
Sound card	Sound blaster MPC2 compatible, Windows Sound System compatible, 2 mixer inputs (for modem and TV sound)
Loudspeaker	Corresponding to the sound card
Modem	28.8 voice/fax modem (TAPI driver)
Monitor	15" VGA colour monitor
Touchscreen (optional)	Elotouch systems, accotouch with serial interface
TV card (optional)	Fast Movie Machine II
Mouse	Microsoft PS/2 compatible
Interfaces	2 serial interfaces (RS 232) and one parallel interface COM 1 reserved for connection to the <i>EIB</i>
Operating system	Microsoft WINDOWS 95

Table 5-1 Hardware requirements for the HomeAssistant

5.3.2 Connection conditions

In each case it is necessary to provide one serial *EIB* interface (RS 232) and a corresponding mains connection for every PC. If several installation points are required, this can be achieved by implementing the actions described below as many times as required.

Fig. 5-7 is a schematic representation of the various connections to the different networks and the connections to the PC and monitor.

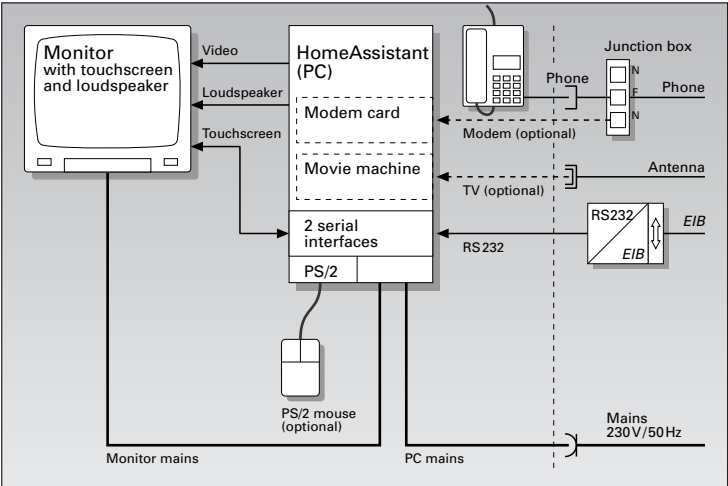


Fig. 5-7 Connections from the HomeAssistant to the various networks and monitor

Mains connection (230 V)

At least one SCHUKO socket is required at the planned installation site; the monitor is usually supplied and switched on/off via the PC. If not, a second mains connection will be necessary.

EIB connection

Connection to the *EIB* occurs via a serial interface (RS 232).

Junction box

Telecommunication connection (option)
Connection to the telecommunications network is achieved via a junction box (analogue).

Antenna socket

TV connection (option)
In order to be able to use the HomeAssistant as a regular TV, a TV card must be installed and a suitable antenna socket provided.

Connections between PC and monitor
In order to guarantee the functioning of the HomeAssistant, the standard cables specified by the manufacturer must be used. With relatively high standard cables, lengths of up to 10 m are permitted.

5.3.3 Design specifications

Setting up an *EIB* project with a HomeAssistant requires the use of two software tools:

- ETS 2 for creating the *EIB* project
- HomeAssistant Tool Software (HTS) for entering additional information for the HomeAssistant.

Product database

The sequence of steps is displayed in Fig. 5-8.
The first step towards visualisation is the creation of a project with ETS 2. The product database must also exist in ETS 2 format. It may be necessary to convert an old ETS 1.x project. The HomeAssistant necessary to the project must strictly adhere to the rules of ETS 2.

a) Building structure
Especially important are the entry of room structure, allocation of devices to rooms, completion of the “key” fields and the addition of extra groups.
Adhering to these guidelines is important because the names for rooms and devices are derived from this infor-

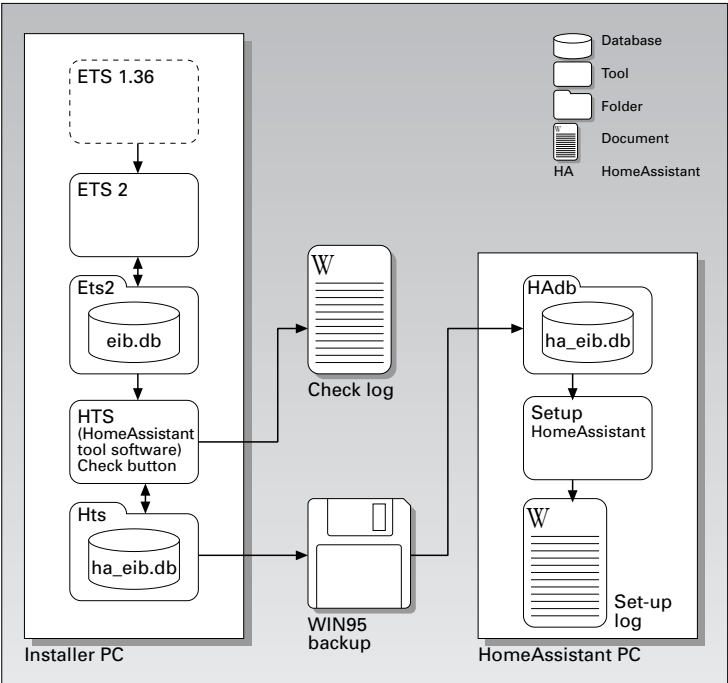


Fig. 5-8 Setting up databases with ETS and HTS

mation. These names are then displayed in the HomeAssistant menus and indicate to the end user the unique system.

b) Single actuator groups

For every used channel of every actuator, a separate group address must be specified in the ETS 2 project, so that all actuator functions can be controlled separately from the HomeAssistant. In addition, the so-called single actuator group must be set to “transmitting” for the actuator communication object.

Single actuator group

c) Status communication object groups

A separate group address must be assigned to every status communication object. The HomeAssistant needs these

Status communication object

groups in order to be able to read the status of the *EIB* devices.

Actuator application programs, which do not contain status communication objects, should not be used as this may lead to functional restrictions at the HomeAssistant.

d) Flags for communication objects

Flag

The first step is to select the standard settings for the flags of all communication objects. This is achieved by selecting the "Standard" button in the "Edit object" window of the ETS 2 software.

The following points should also be noted:

The "read" flag must be set for every communication object whose value is to be read by the HomeAssistant via the *EIB*. This is especially valid for:

- All status communication objects.
- Sensor communication objects whose status is of interest to the HomeAssistant (e.g. movement detectors).

It is also necessary to ensure that relevant telegrams can reach the HomeAssistant. The corresponding parameterisation of the line couplers is achieved by deactivating the filter tables.

5.4 Installation

Before installation can begin, the database of the *EIB* system must be adapted to the requirements of the HomeAssistant and stored in the PC. If a touchscreen is used, the touchscreen driver must also be installed.

If the PC is configured according to the specifications, the HomeAssistant base package complete with CD-ROM is loaded into the PC via the CD drive.

This is followed by the installation of the actual HomeAssistant, taking into account the specific conditions of the house or flat. The PC internally stores the rooms and devices involved in the *EIB* system (lights, windows, doors, blinds etc.).

5.5 Commissioning

After installing the base package, there are already a number of functions available. The individual applications are installed in the HomeAssistant under "System extension". Other functions are obtained from extra packages, which are also loaded into the PC from the associated CD-ROM. If communication sockets are installed, bus compatible devices can be connected to them and integrated into the system using the product-specific CD-ROMs supplied with them.