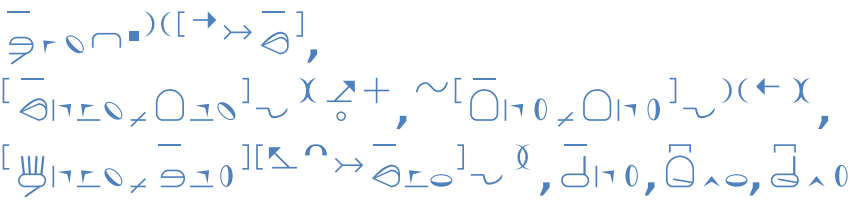
DGS-Korpus Project Note AP04-2021-02

HamNoSys in TEX



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Abstract

The Hamburg Notation System, HamNoSys for short, is a system for the phonetic transcription of signed languages. The TeX package *hamnosys* makes the HamNoSys font available in TeX documents.

Zusammenfassung (German Abstract)

Das Hamburger Notationssystem, kurz HamNoSys, ist ein System zur phonetischen Transkription von Gebärdensprachen. Das TeX-Package *hamnosys* stellt den HamNoSys-Zeichensatz für TeX-Dokumente zur Verfügung.

Contents

1 Introduction **2**
- 1.1 Requirements . . . 2
- 1.2 Installation . . . 3
- 1.3 Usage . . . 3
- 1.4 Licence . . . 3

2 HamNoSys using character input **3**
- 2.1 Activating the HamNoSys font . . . 4
- 2.2 The package option *autofont* . . . 4
- 2.3 HamNoSys in the source document . . . 5

3 HamNoSys using symbol commands **5**

4 HamNoSys using symbol names **6**

5 List of HamNoSys symbols **7**
5.1 Handshapes . . . 7
5.2 Handshape modifiers . . . 7
5.3 Extended finger directions . . . 7
5.4 Palm orientation . . . 8
5.5 Location . . . 8
5.6 Location modifiers . . . 9
5.7 Movement . . . 10
5.8 Movement modifiers . . . 11
5.9 Other symbols . . . 12
5.10 Version symbol . . . 12
5.11 Regular Unicode characters . . . 12
5.12 Obsolete spacing symbols . . . 13

References **13**

1 Introduction

The Hamburg Notation System, HamNoSys for short, is a system for the phonetic transcription of signed languages. It was originally introduced in 1984 and the first public version followed in 1987 (Prillwitz et al., 1987; Prillwitz et al., 1989). The latest release of HamNoSys is version 4.1 (Schmaling and Hanke, 2001). For a brief introduction into the structure of HamNoSys see Hanke (2004).

The TeX package *hamnosys* enables the use of HamNoSys symbols in TeX documents. It provides three methods of entering HamNoSys symbols:

1. direct input of symbols as Unicode characters in the TeX file, just like one would enter regular characters (see Section 2).

2. using TeX commands that have been defined for each individual symbol (see Section 3),

3. listing names of symbols inside the command `\hamnosys` (see Section 4).

This document describes the technical requirements (Section 1.1), how to install the package (Section 1.2), how to use the TeX file (Section 1.3), the licence conditions of the package (Section 1.4), the three usage methods (Sections 2, 3 and 4), and provides an overview of all HamNoSys symbols (Section 5).

1.1 Requirements

This package requires the use of XeLaTeX or LuaLaTeX. It unfortunately does not work with regular LaTeX (i. e. the compilers `latex` and `pdfLatex`) as it needs to import an external unicode font.

1.2 Installation

The source code of the *hamnosys* package can be found in a git repository on the Github account of the DGS-Korpus project.[1] It is also archived via the research data repository of Universität Hamburg.[2]

As the *hamnosys* package is still in its test phase, it is not (yet) part of CTAN and is not listed in any TeX distribution. Therefore it has to be integrated manually into each LaTeX project. To do this you download the repository and copy the files `hamnosys.sty` and `HamNoSysUnicode.ttf` into the main directory of your LaTeX project.

To also be able to use HamNoSys elsewhere on your computer (see Section 2.3), it is recommended to install the font through your operating system as well. It is available online as part of the HamNoSys software package.[3] In addition to the font file (Mac/Linux/Windows/Web), the archive also includes an application for writing HamNoSys via an input palette (Mac/Linux/Windows) and a HamNoSys keyboard layout (Mac only). The input palette is also available as a web interface[4] and as part of the corpus software iLex[5].

1.3 Usage

The package can be imported normally via `\usepackage{hamnosys}`. It has a single optional parameter, *autofont*, which automates switching to the HamNoSys font when entering HamNoSys symbols as Unicode characters. (siehe Section 2.2).

HamNoSys is displayed through the special font *HamNoSysUnicode*. To input HamNoSys symbols as regular Unicode characters in your document, you need to switch to this font by using the command `\texthamnosys{}` or the switch command `\hamnosysfont` (see Section 2.1).

Alternatively you can enter HamNoSys symbols via invidual commands (Section 3) or enter their names inside the command `\hamnosys{}` (Section 4). For an overview of all HamNoSys symbols, their names and the commands with which they can be generated, see Section 5.

1.4 Licence

2 HamNoSys using character input

HamNoSys symbols can be entered directly into a TeX document like any other character. This allows you to copy-paste them from other programs or to enter them as direct input via HamNoSys keyboard layouts.

[1] https://github.com/DGS-Korpus/HamNoSys4TeX
[2] TeX package *hamnosys* (latest version): https://doi.org/10.25592/uhhfdm.9643
[3] HamNoSys software package (latest version): https://doi.org/10.25592/uhhfdm.9724
[4] https://www.sign-lang.uni-hamburg.de/hamnosys/input/
[5] https://www.sign-lang.uni-hamburg.de/ilex/
[6] https://www.latex-project.org/lppl.txt

HamNoSys is displayed via a special font. You therefore need to either actively switch between regular fonts and the HamNoSys font (Section 2.1) or activate the package option *autofont* (Section 2.2).

2.1 Activating the HamNoSys font

To explicitly tell LaTeX that content should be displayed using the HamNoSys font, you can use the command `\texthamnosys{}` or the switch command `\hamnosysfont`. These behave like e. g. the italics commands `\textit{}` and `\itshape` do, respectively.

```
You can use \texthamnosys{⟨hamnosys⟩} to sign Hamburg.
```

or

```
You can use {\hamnosysfont ⟨hamnosys⟩} to sign Hamburg}.
```

Output: You can use ⟨hamnosys⟩ to sign Hamburg.

Warning: The HamNoSys font knows *only* HamNoSys symbols, but no other characters. Therefore you have to be careful to switch back to the regular font after using it. The easiest way to do so is to always put HamNoSys symbols inside the `\texthamnosys{}` command. If you use `\hamnosysfont`, it is best to limit its scope by using curly braces (see above). The following example shows display issues that follow from not limiting the scope of the font:

```
You can use \hamnosysfont ⟨hamnosys⟩ to sign Hamburg.
```

Output: You can use ⟨hamnosys⟩ ■■ ■■■■ ■■■■■■■.

2.2 The package option *autofont*

An alternative to explicitly activating the HamNoSys font is the optional package parameter *autofont*, which activates automatic switching between regular and HamNoSys fonts. This makes the use of `\hamnosysfont` and `\texthamnosys{}` unnecessary in many cases. *autofont* is available in XeLaTeX, but not in LuaLaTeX.

An important limitation is that *autofont* only recognises those characters as HamNoSys symbols that are not also used in regular texts. It works for almost all HamNoSys symbols, except for those listed in Section 5.11, which will be displayed using the regular document font unless you have activated the HamNoSys font explicitly. The following example shows such a case. Note that the curly braces and the vertical bar are displayed thinner in the regular font than in the HamNoSys font:

```
...
\usepackage[autofont]{hamnosys}
\begin{document}

Compare the braces and bar in
\{⟨hamnosys⟩\}
with those in
\texthamnosys{\{⟨hamnosys⟩\}}.

\end{document}
```

Output: Compare the braces and bar in {  |  } with those in **{****|****}**.

The technical reason for this behaviour is that *autofont* takes advantage of the fact that almost all characters of the HamNoSys font are located in *Private Use Area* of Unicode. This is a group of characters that the Unicode Consortium intentionally provides no meanings for, reserving them instead for use by special use cases that are not covered by Unicode, such as HamNoSys. *autofont* uses the XeLaTeX package *ucharclasses* to define commands that automatically switch fonts for all characters in the *Private Use Area*. However, there is a small number of characters relevant to HamNoSys that are located in the regular areas of Unicode, e. g. the question mark and curly braces. As these lie outside of the *Private Use Area autofont* cannot detect that they are supposed to be part of HamNoSys.

Another limitation is that *autofont* will always format all characters in the *Private Use Area* with the HamNoSys font. In the special case where you are using yet another font that also makes use of the *Private Use Area* this could lead to conflicts. In such cases you should not use *autofont* and instead change fonts explicitly or use one of the other methods.

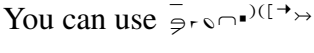
2.3 HamNoSys in the source document

If you would like to also correctly display HamNoSys symbols in your TeX source code (instead of as many identical rectangles) you need to make sure that the font *HamNoSysUnicode* is installed in your operating system (see Section 1.2). Should it not be possible to install fonts (e. g. in an online editor) or the editor you use still does not display the symbols, it might be preferable to use symbol commands or names instead (see Sections 3 and 4). It should be noted, however, that it does not matter for the final PDF output file whether the source code was readable in the editor. As long as the font was correctly activated (see Section 2.1) all symbols should be displayed, even if they looked like identical rectangles in the input.

3 HamNoSys using symbol commands

The *hamnosys* package defines individual commands for each HamNoSys symbol. This is an alternative ASCII-compatible input method for HamNoSys. A list of all symbol commands can be found in Section 5.

```
You can use \hamceeall\hamthumbopenmod\hamfingerstraightmod\hamextfingerul
\hampalmdl\hamforehead\hamlrat\hamclose\hamparbegin\hammover\hamreplace
\hampinchall\hamfingerstraightmod\hamparend{} to sign Hamburg.
```

Output: You can use  to sign Hamburg.

As is usual for LaTeX you should make sure to close commands with `{}` where necessary to prevent the accidental consumption of the following character.

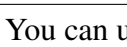
The names of the commands match the official names of the HamNoSys symbols as they are defined in the *HamNoSysUnicode* font. An exception are symbols whose names contain digits (see Sections 5.1 and 5.10). As digits are not allowed to be part of LaTeX commands, they are written out as English words instead. For example, the symbol has the name *hamfinger2* and the command `\hamfingertwo`.

An advantage of symbol commands is that they are always displayed in the correct font. Explicitly switching fonts with the help of `\hamnosysfont` or `\texthamnosys{}` is not required.

4 HamNoSys using symbol names

The command \hamnosys{} allows you to input HamNoSys as a comma-separated sequence of symbol names. The symbol names can be taken from the lists in Section 5 or copied from the web input palette (see Section 1.2).

```
You can use \hamnosys{hamceeall,hamthumbopenmod,hamfingerstraightmod,
   hamextfingerul,hampalmdl,hamforehead,hamlrat,hamclose,hamparbegin,hammover,
   hamreplace,hampinchall,hamfingerstraightmod,hamparend} to sign Hamburg.
```

Output: You can use  to sign Hamburg.

Unlike the symbol commands of Section 3), symbol names in \hamnosys{} may contain digits. In fact, both the name version with digits and the one with written out number words are accepted.

```
\hamnosys{hamfinger2}
```

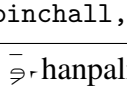
or

```
\hamnosys{hamfingertwo}
```

Output:

Symbol names must be separated by commas. Whitespaces are allowed after the comma, but not required. If a sequence contains an unknown term you will receive a compiler warning and the unknown term will be output as regular text. Unknown terms may be caused by typos, terms that are not part of the HamNoSys symbol name vocabulary, errors in comma separation or that a whitespace was entered **before** a comma. In the following example the symbol *hampalmdl* was accidentally spelled *hanpalmdl*:

```
\hamnosys{hamceeall,hamthumbopenmod,hamfingerstraightmod,hamextfingerul,
   hanpalmdl,hamforehead,hamlrat,hamclose,hamparbegin,hammover,hamreplace,
   hampinchall,hamfingerstraightmod,hamparend}
```

Output: 

5 List of HamNoSys symbols

The following tables provide an overview of all HamNoSys symbols. For each symbol they provide its name, which command produces it, the symbol itself, and the hexadecimal value that is used to represent it in Unicode. Modifiers are symbols that function as diacritics, combining with the preceding character.

5.1 Handshapes

Name	Command	Symbol	Hex
hamfist	\hamfist		E000
hamflathand	\hamflathand		E001
hamfinger2	\hamfingertwo		E002
hamfinger23	\hamfingertwothree		E003
hamfinger23spread	\hamfingertwothreespread		E004
hamfinger2345	\hamfingertwothreefourfive		E005
hampinch12	\hampinchonetwo		E006
hampinchall	\hampinchall		E007
hampinch12open	\hampinchonetwoopen		E008
hamcee12	\hamceeonetwo		E009
hamceeall	\hamceeall		E00A
hamceeopen	\hamceeopen		E00B

5.2 Handshape modifiers

Name	Command	Symbol	Hex
hamthumboutmod	\hamthumboutmod		E00C
hamthumbacrossmod	\hamthumbacrossmod		E00D
hamthumbopenmod	\hamthumbopenmod		E00E
hamfingerstraightmod	\hamfingerstraightmod		E010
hamfingerbendmod	\hamfingerbendmod		E011
hamfingerhookmod	\hamfingerhookmod		E012
hamdoublebent	\hamdoublebent		E013
hamdoublehooked	\hamdoublehooked		E014

5.3 Extended finger directions

Name	Command	Symbol	Hex
hamextfingeru	\hamextfingeru		E020
hamextfingerur	\hamextfingerur		E021
hamextfingerr	\hamextfingerr		E022

Name	Command	Symbol	Hex
hamextfingerdr	\hamextfingerdr		E023
hamextfingerd	\hamextfingerd		E024
hamextfingerdl	\hamextfingerdl		E025
hamextfingerl	\hamextfingerl		E026
hamextfingerul	\hamextfingerul		E027
hamextfingerol	\hamextfingerol		E028
hamextfingero	\hamextfingero		E029
hamextfingeror	\hamextfingeror		E02A
hamextfingeril	\hamextfingeril		E02B
hamextfingeri	\hamextfingeri		E02C
hamextfingerir	\hamextfingerir		E02D
hamextfingerui	\hamextfingerui		E02E
hamextfingerdi	\hamextfingerdi		E02F
hamextfingerdo	\hamextfingerdo		E030
hamextfingeruo	\hamextfingeruo		E031

5.4 Palm orientation

Name	Command	Symbol	Hex
hampalmu	\hampalmu		E038
hampalmur	\hampalmur		E039
hampalmr	\hampalmr		E03A
hampalmdr	\hampalmdr		E03B
hampalmd	\hampalmd		E03C
hampalmdl	\hampalmdl		E03D
hampalml	\hampalml		E03E
hampalmul	\hampalmul		E03F

5.5 Location

Name	Command	Symbol	Hex
hamhead	\hamhead		E040
hamheadtop	\hamheadtop		E041
hamforehead	\hamforehead		E042
hameyebrows	\hameyebrows		E043
hameyes	\hameyes		E044
hamnose	\hamnose		E045
hamnostrils	\hamnostrils		E046
hamear	\hamear		E047
hamearlobe	\hamearlobe		E048
hamcheek	\hamcheek		E049

Name	Command	Symbol	Hex
hamlips	\hamlips		E04A
hamtongue	\hamtongue		E04B
hamteeth	\hamteeth		E04C
hamchin	\hamchin		E04D
hamunderchin	\hamunderchin		E04E
hamneck	\hamneck		E04F
hamshouldertop	\hamshouldertop		E050
hamshoulders	\hamshoulders		E051
hamchest	\hamchest		E052
hamstomach	\hamstomach		E053
hambelowstomach	\hambelowstomach		E054
hamneutralspace	\hamneutralspace	∅	E05F
hamupperarm	\hamupperarm		E060
hamelbow	\hamelbow		E061
hamelbowinside	\hamelbowinside		E062
hamlowerarm	\hamlowerarm		E063
hamwristback	\hamwristback		E064
hamwristpulse	\hamwristpulse		E065
hamthumbball	\hamthumbball		E066
hampalm	\hampalm		E067
hamhandback	\hamhandback		E068
hamthumbside	\hamthumbside		E069
hampinkyside	\hampinkyside		E06A
hamthumb	\hamthumb		E070
hamindexfinger	\hamindexfinger		E071
hammiddlefinger	\hammiddlefinger		E072
hamringfinger	\hamringfinger		E073
hampinky	\hampinky		E074
hamfingertip	\hamfingertip		E075
hamfingernail	\hamfingernail		E076
hamfingerpad	\hamfingerpad		E077
hamfingermidjoint	\hamfingermidjoint		E078
hamfingerbase	\hamfingerbase		E079
hamfingerside	\hamfingerside		E07A

5.6 Location modifiers

Name	Command	Symbol	Hex
hamlrbeside	\hamlrbeside	▫	E058
hamlrat	\hamlrat	▪	E059
hamcoreftag	\hamcoreftag	□	E05A
hamcorefref	\hamcorefref	○	E05B

5.7 Movement

Name	Command	Symbol	Hex
hammoveu	\hammoveu		E080
hammoveur	\hammoveur		E081
hammover	\hammover		E082
hammovedr	\hammovedr		E083
hammoved	\hammoved		E084
hammovedl	\hammovedl		E085
hammovel	\hammovel		E086
hammoveul	\hammoveul		E087
hammoveol	\hammoveol		E088
hammoveo	\hammoveo		E089
hammoveor	\hammoveor		E08A
hammoveil	\hammoveil		E08B
hammovei	\hammovei		E08C
hammoveir	\hammoveir		E08D
hammoveui	\hammoveui		E08E
hammovedi	\hammovedi		E08F
hammovedo	\hammovedo		E090
hammoveuo	\hammoveuo		E091
hamcircleo	\hamcircleo		E092
hamcirclei	\hamcirclei		E093
hamcircled	\hamcircled		E094
hamcircleu	\hamcircleu		E095
hamcirclel	\hamcirclel		E096
hamcircler	\hamcircler		E097
hamcircleul	\hamcircleul		E098
hamcircledr	\hamcircledr		E099
hamcircleur	\hamcircleur		E09A
hamcircledl	\hamcircledl		E09B
hamcircleol	\hamcircleol		E09C
hamcircleir	\hamcircleir		E09D
hamcircleor	\hamcircleor		E09E
hamcircleil	\hamcircleil		E09F
hamcircleui	\hamcircleui		E0A0
hamcircledo	\hamcircledo		E0A1
hamcircleuo	\hamcircleuo		E0A2
hamcircledi	\hamcircledi		E0A3
hamfingerplay	\hamfingerplay		E0A4
hamnodding	\hamnodding		E0A5
hamswinging	\hamswinging		E0A6
hamtwisting	\hamtwisting		E0A7
hamstircw	\hamstircw		E0A8
hamstirccw	\hamstirccw		E0A9
hamreplace	\hamreplace		E0AA

Name	Command	Symbol	Hex
hamnomotion	\hamnomotion		E0AF
hamclocku	\hamclocku		E0B0
hamclockul	\hamclockul		E0B1
hamclockl	\hamclockl		E0B2
hamclockdl	\hamclockdl		E0B3
hamclockd	\hamclockd		E0B4
hamclockdr	\hamclockdr		E0B5
hamclockr	\hamclockr		E0B6
hamclockur	\hamclockur		E0B7
hamclockfull	\hamclockfull		E0B8
hamarcl	\hamarcl		E0B9
hamarcu	\hamarcu		E0BA
hamarcr	\hamarcr		E0BB
hamarcd	\hamarcd		E0BC
hamwavy	\hamwavy		E0BD
hamzigzag	\hamzigzag		E0BE
hamellipseh	\hamellipseh		E0C0
hamellipseur	\hamellipseur		E0C1
hamellipsev	\hamellipsev		E0C2
hamellipseul	\hamellipseul		E0C3
hamincreasing	\hamincreasing		E0C4
hamdecreasing	\hamdecreasing		E0C5
hamfast	\hamfast		E0C8
hamslow	\hamslow		E0C9
hamtense	\hamtense		E0CA
hamrest	\hamrest		E0CB
hamhalt	\hamhalt		E0CC
hamclose	\hamclose		E0D0
hamtouch	\hamtouch		E0D1
haminterlock	\haminterlock		E0D2
hamcross	\hamcross		E0D3
hamarmextended	\hamarmextended		E0D4
hambehind	\hambehind		E0D5
hambrushing	\hambrushing		E0D6

5.8 Movement modifiers

Name	Command	Symbol	Hex
hamsmallmod	\hamsmallmod	◦	E0C6
hamlargemod	\hamlargemod	•	E0C7

5.9 Other symbols

Name	Command	Symbol	Hex
hamrepeatfromstart	\hamrepeatfromstart		E0D8
hamrepeatfromstartseveral	\hamrepeatfromstartseveral		E0D9
hamrepeatcontinue	\hamrepeatcontinue		E0DA
hamrepeatcontinueseveral	\hamrepeatcontinueseveral		E0DB
hamrepeatreverse	\hamrepeatreverse		E0DC
hamalternatingmotion	\hamalternatingmotion		E0DD
hamseqbegin	\hamseqbegin		E0E0
hamseqend	\hamseqend		E0E1
hamparbegin	\hamparbegin		E0E2
hamparend	\hamparend		E0E3
hamfusionbegin	\hamfusionbegin		E0E4
hamfusionend	\hamfusionend		E0E5
hambetween	\hambetween		E0E6
hamplus	\hamplus		E0E7
hamsymmpar	\hamsymmpar		E0E8
hamsymmlr	\hamsymmlr		E0E9
hamnondominant	\hamnondominant		E0EA
hamnonipsi	\hamnonipsi		E0EB
hametc	\hametc		E0EC
hamorirelative	\hamorirelative		E0ED
hammime	\hammime		E0F0

5.10 Version symbol

Name	Command	Symbol	Hex
hamversion40	\hamversionfourzero		E0F1

5.11 Regular Unicode characters

The following characters are not correctly recognised as HamNoSys symbols by *autofont* (see Section 2.2). If the HamNoSys font is not explicitly activated, these characters will instead be displayed using the regular document font. To compare these two possible output forms, they are contrasted in the columns *Symbol* (HamNoSys) and *Unicode* (normal).

Name	Command	Symbol	Unicode	Hex
hamspace	\hamspace			20
hamexclaim	\hamexclaim	!	!	21
hamcomma	\hamcomma	,	,	002C
hamfullstop	\hamfullstop	.	.	002E
hamquery	\hamquery	?	?	003F

Name	Command	Symbol	Unicode	Hex
hamaltbegin	\hamaltbegin	{	{	007B
hammetaalt	\hammetaalt	|	|	007C
hamaltend	\hamaltend	}	}	007D

5.12 Obsolete spacing symbols

The following symbols are marked as obsolete, but can still be found in the HamNoSys font.

Name	Command	Symbol	Hex
hamwristtopulse	\hamwristtopulse		E07C
hamwristtoback	\hamwristtoback		E07D
hamwristtothumb	\hamwristtothumb		E07E
hamwristtopinky	\hamwristtopinky		E07F
hammovecross	\hammovecross		E0AD
hammoveX	\hammoveX		E0AE

References

Hanke, Thomas (2004). 'HamNoSys – Representing Sign Language Data in Language Resources and Language Processing Contexts'. In: *4th International Conference on Language Resources and Evaluation (LREC 2004). Proceedings of the LREC2004 Workshop on the Representation and Processing of Sign Languages: From SignWriting to Image Processing. Information techniques and their implications for teaching, documentation and communication* (Lisbon, Portugal). Ed. by Oliver Streiter and Chiara Vettori. Paris, France: European Language Resources Association (ELRA), pp. 1–6. URL: https://www.sign-lang.uni-hamburg.de/lrec/pub/04001.pdf.

Prillwitz, Siegmund, Regina Leven, Heiko Zienert, Thomas Hanke, Jan Henning et al. (1987). *HamNoSys. Hamburg Notation System for Sign Language. An Introduction*. Hamburg, Germany: Zentrum für deutsche Gebärdensprache.

— (1989). *HamNoSys. Version 2.0. Hamburg Notation System for Sign Languages. An Introductory Guide*. Hamburg, Germany: Signum. 46 pp. ISBN: 978-3-927731-01-1.

Schmaling, Constanze and Thomas Hanke (2001). 'Encoding manual aspects of sign language: HamNoSys 4.0'. In: *ViSiCAST Deliverable D5-1: Interface Definitions*. Ed. by Thomas Hanke, pp. 26–41. URL: https://vhg.cmp.uea.ac.uk/tech/hamnosys/ViSiCASTD5-1.pdf.