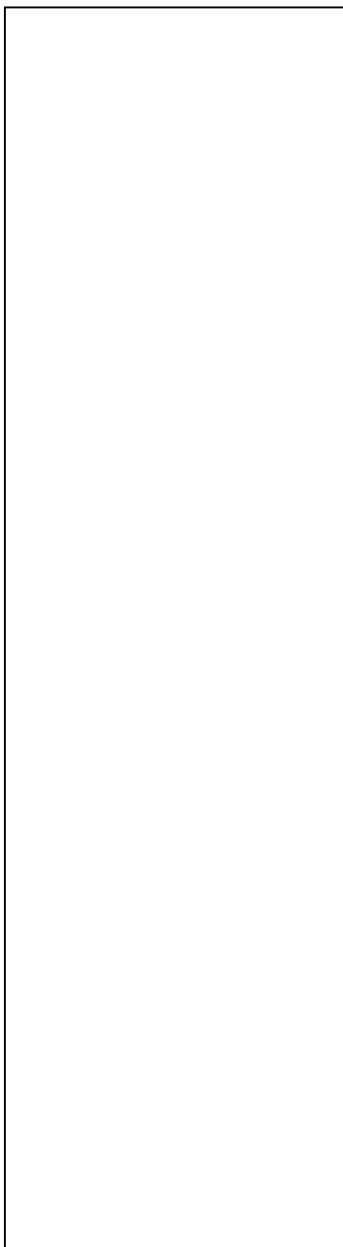


User's Guide KALMAN

Appendices

Additional information about the Kalman system



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Maintenance : see www.helpdeskwater.nl/waqua
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APPENDIX A REFERENCES

- A.W.Heemink `Storm surge prediction using kalman filtering', PhD-thesis,
University of Twente, 1986.
- Icim Rijswijk `User's Guide WAQUA', version number 4.04, 2 September 1993.
- Icim Rijswijk `Local data structure Waqua-in-Simona', Simona report number
92-09.

APPENDIX B COMPREHENSIONS

Characteristic	The name of a data array or compound array in SIMONA.
Compound array	An array with references to other data or compound arrays in SIMONA.
DIRectory SYStem	A software library with routines built upon SIMONA to ease the access to the LDS/SDS.
DONAR	The database system which will be the standard at RIKZ in future.
IBUFFR	The SIMONA buffer for the storage of SIMONA data in memory.
KALMAN	Program to compute the time invariant Kalman filter.
OBS2SDS	Program to append observed data to a WAQUA SDS file.
LDS	Local Data Structure of SIMONA.
LGRID	A pointer table referring to the computational grid points.
NEWOBS	Program to create an observed data file in a format valid for WAQAD from an OBSFIL input file.
OBSFIL	A WAQUA post-processing program.
RSDS	Interactive or batch program to read the data stored in an SDS file based on DIRSYS names.
SDS file	Simona Data Storage file.
SDS Documentation File	An input file describing the LDS stored in an SDS file, read by DIRSYS.
SIMONA	Dutch acronym for " <u>S</u> imulatie <u>M</u> odellen voor de <u>N</u> atte Waterstaat" (Simulation models for RWS).
WAQPRE	WAQUA's pre-processor.
WAQPRO	WAQUA's processor.
WAQUA	The complete package of pre-processor, processor and post-processors to simulate WAter QUAlity models and analyse the results.

APPENDIX C EXAMPLES

C.1 Control input file (with wind noise and boundary condition parameters)

```

General
  COMPUtation_time = 1440.
  BOTtom_friction  = 0.0024
#
WATERlevel_stations
  S: (NAME = ' WICK'           , STANdard_dev=0.05)
  S: (NAME = ' NORTH SHIELDS' , STANdard_dev=0.05)
  S: (NAME = ' LOWESTOFT'     , STANdard_dev=0.05)
  S: (NAME = ' SHEERNESS'    , STANdard_dev=0.05)
  S: (NAME = ' DOVER'        , STANdard_dev=0.05)
  S: (NAME = ' NEWHAVEN'     , STANdard_dev=0.05)
  S: (NAME = ' VLISSINGEN'   , STANdard_dev=0.05)
  S: (NAME = ' HOEKVANHOLLAND' , STANdard_dev=0.05)
  S: (NAME = ' DEN HELDER'   , STANdard_dev=0.05)
  S: (NAME = ' IJMUIDEN'     , STANdard_dev=0.05)
#
WIND_noise
  STATistics
    STANdard_dev = 0.003
    TIME_correlation = 0.9
  GRID
    M_Increment =41 , M_Start =1
    N_Increment =44 , N_Start =1
#
BOUNDaries
  STATistics
    STANdard_dev = 0.03
    TIME_correlation = 0.95
  LINE_sections
    S: SECTion =( 1, 4)
    S: SECTion =( 5,10)
    S: SECTion =(11,18)
    S: SECTion =(19,23)
#

```

C.2 Observed data file

This is an example of an observed data file

```
ENDTXT
NUMVAL, 4
FORMAT, (4(F7.2))
NUMPT, 4
    37, 64, 0.2
    44, 43, 0.2
    56, 28, 0.18
    52, 22, 0.21
TIME, 4320.
    .15 -1.06  .45 -1.59
TIME, 4330.
    .21 -1.15  .49 -1.42
TIME, 999999.
```

APPENDIX D SDS DOCUMENTATION FILE

```

#
# -----
# WAQUA problem field FLOW
# -----
#
1  'MESH'      LOAD
#
2  'IDIMEN'      length=1, type='int'
      'ndim'      'mmax'      'nmax'      'mnmax'      'mnmaxk'      'nenclo'
      'ldam'      'nocols'      'noroco'      'norows'      'nslu'      'nsluv'
      'nslv'      'nto'      'iadlnd'      'kurflg'      'nrrou'      'kmax'
      'kmaxs'
#
2  'CONMSH'      length=1, type='real'
      'al'      'dy'      'dksi'      'anglat'      'rlambd'      'fi'
      'grdang'      'dlambd'      'dfi'      'rearth'
#
      length=3, type='int'
      length='*/mesh/idimen/nenclo'
2  'IENCLO'
#
2  'IOPEN'      length='/mesh/idimen/nto', type='int'
      'kb1m'      'kb1n'      'kb2m'      'kb2n'
#
2  'BARPOS'      length='/mesh/idimen/nsluv', type='int'
      'mbar'      'nbar'      'ibuv'
#
2  'IROGEO'      length=3      length='*/mesh/idimen/norows'
      'irows'      type='int'
      'icols'      length=3      length='*/mesh/idimen/nocols'
#
      length='/mesh/idimen/nmax'
      length='*/mesh/idimen/mmax'
      type='int'
2  'LGRID'
#
2  'IDAM'      length='/mesh/idimen/ldam', type='int'
      'mdam'      'ndam'
#
      length='/mesh/idimen/mnmaxk', type='real'
2  'H'
#
2  'IVARWP'      length=1, type='int'
      'ipm'      'jpm'      'mpf'      'npf'      'iwm'      'jwm'
      'mwf'      'nwf'
#
2  'CURVIL'      length='/mesh/idimen/mnmaxk', type='real'
      'guu'      'gvv'      'xdep'      'ydep'      'xzeta'      'yzeta'
#
2  'NAMMSH'      length='/mesh/idimen/nsluv', type='char*80'
      'nambar'
      'namt1'      length='/mesh/idimen/nto'
      'namt2'
#
2  'WEIPOS'      length='/mesh/idimen/nrou', type='int'
      'mwei'      'nwei'      'iweiu'      'iweiv'
#
      length='/mesh/idimen/kmaxs', type='real'

```

```

2   'HLAY'
#
      length='/mesh/idimen/kmaxs', type='real'
2   'INDLAY'
#
#
#
1   'SOLUTION_DRYWET' length='/mesh/idimen/mnmaxk', type='int'
      'khu'           'khv'
#
#
#
1   'COEFF_GENERAL'
#
2   'ICGENA'          length=1, type='int'
      'notgwn'        'isvwp'          'icdflg'         'iwlopf'         'ikalmn'
#
2   'RCGENB'          length=1, type='real'
      'ag'             'dair'           'dwat'           'wconv'          'wstr'           'wscdv1'
      'wscdv2'         'cdv1'           'cdv2'
#
2   'WIND'            length=1, type='real'
      'pwindi'         'pwinai'
      'timdis'         length='/coeff_general/icgena/notgwn'
      'pwind'          'pwinda'
#
2   'IREFSW'          length=1, type='char*80'
      'wpsds'          'wpnexp'
#
      length='/mesh/idimen/mnmaxk', type='real'
      length='*/mesh/idimen/kmax'
2   'DIFCO'
#
2   'IREFKM'          length=1, type='char*80'
      'kalsds'         'kalexp'
#
#
1   'PROBLEM_FLOW'    LOAD
#
#
1   'CONTROL_FLOW'
#
2   'ICONTA'          length=1, type='int'
      'nopow'          'nsrc'           'ntof'           'ntot'           'kc'             'nowl'
      'nocur'          'ntra'           'ntrav'          'notbar'         'nottid'         'notdis'
#
2   'ICONTB'          length=1, type='int'
      'idryfl'         'iter1'          'iter2'          "                 "                 'ldengr'
      "                 length=18
      'nprc'           length=1
      "                 "               'nprsep'         'nprvcu'         'nprvcv'         'nprvcw'
      "                 'nprvml'        'nprvmu'         'nprvmv'         'roumet'         "
      "                 "               "                 "                 'iturf!'         'irwall'
      'logbou'        'Irich'
#
2   'RCONTA'          length=1, type='real'
      'dtmin'          "                 'tstart'         'tstop'          "                 'eps'
      "                 'ticval'         "                 "                 'var'            "
      "                 "                 "                 "                 "                 "
      "                 "                 "                 "                 'tlfsmo'         "
      "                 "                 "                 "                 "                 "
      'salw'           "                 "                 'rhom'           'alph0'          'tempw'
      'thetac'        'rfelag'         'rfelng'         'hkrdum'         "                 'vico'

```

```

#           "           "           'defviv'   'z0'           'teta'           'cmukl'
#
# 2  'RCONTB'           length=42, type='real'
#     'tprint'
#           'tfhisp'           length=1
#           'tthisp'           'tlhisp'           'tfstap'           'tistap'           'tlstap'
#           "           length=52
#           'tfint'           length=1
#           'tthist'           'tiint'           'tlint'           'tfmapf'           'timapf'           'tmapf'
#           'tthist'           'tthist'           'tlhist'           'tfrst'           'tirst'           'tirst'
#
#
#
# 1  'PROBLEM_FLOW'
#
# 2  'IROBOU'           length=2, type='int'
#           'irowb'           length='*/mesh/idimen/norows'
#           'icolb'           length=2
#           'icolb'           length='*/mesh/idimen/nocols'
#
# 2  'IDISCH'           length='/control_flow/icona/nsrc', type='int'
#           'mdis'           'ndis'           'kdis'
#
# 2  'NAMPRB'           type='char*80'
#           'itdate'           length=1
#           'namdis'           length='/control_flow/icona/nsrc'
#
#
#
# 1  'CHECKPOINTS_FLOW'
#
# 2  'IWLPT'           type='int'
#           'mwl'           length='/control_flow/icona/nowl'
#           'mwl'           'nwl'
#
# 2  'ICURPT'           type='int'
#           'mc'           length='/control_flow/icona/nocur'
#           'mc'           'nc'
#
# 2  'ICROSV'           type='int'
#           'mit'           length='/control_flow/icona/ntra'
#           'mit'           'nit1'           'nit2'
#
# 2  'ICROSV'           type='int'
#           'nit'           length='/control_flow/icona/ntrav'
#           'nit'           'mit1'           'mit2'
#
# 2  'NAMCHK'           type='char*80'
#           'namwl'           length='/control_flow/icona/nowl'
#           'namwl'           length='/control_flow/icona/nocur'
#           'namc'           length='/control_flow/icona/ntra'
#           'namtra'           length='/control_flow/icona/ntrav'
#           'namtrv'
#
#
#
# 1  'DISPLAYS'

```

```

#
# 2  'IDISPL'      type='int'
#                    length=1
#                    'iwldp'  'isocol'  'isonum'  'nctitl'
#
# 2  'RDISPL'      type='real'
#                    length=1
#                    'arrlen'  'clkrad'  'dxdy'    'fmtiso'  'siziso'  'tang'
#                    'vectw'   'xleft'   'xright'  'ybot'    'ytop'    "
#                    "         "         "         'xdelt'   'ydelt'   "
#                    "         "         "
#                    length=4
#                    'hx'     'hy'     'hz'
#
# 2  'CEPLOT'      type='char*80'
#                    length=1
#                    "         "         'pwunit'  "
#
# 2  'ILAND'       type='int'
#                    length=1
#                    'ncnst'  'nsub'    'nolan'   'nolin'   'nopt'    'ista'
#                    'leng'
#                    length='/displays/iland/leng'
#                    'land'
#
# 2  'RLIN'        type='real'
#                    length='/displays/iland/nolin'
#                    'blin'   'bmod'    'bspc'
#
# 2  'CORLAN'      type='real'
#                    length='/displays/iland/nopt'
#                    'xland'  'yland'
#
# 2  'IPERM'       type='int'
#                    length=1
#                    'ncnst'  'nsub'    'notip'   'ista1'   'leng1'   'ista2'
#                    'leng2'
#                    length='/displays/ipermleng1'
#                    'iticv'
#                    length='/displays/ipermleng2'
#                    'itich'
#
# 2  'PERMNT'      type='real'
#                    length='/displays/ipermlnotip'
#                    'titlm'  'titln'   'titlw'   'titor'   'titsz'
#
#                    length='/displays/ipermlnotip'   type='char*80'
# 2  'TTITL'
#
#
#
# 1  'RUNIDENT'    type='char*80'
#                    length=1
#                    'htitl'  'modid'   'runid'   'titl'    "         'verlds'
#                    'verpre' "         "         'datpre'
#
# -----
# Problem field KALMAN
# -----
#
# 1  'KALMAN'
#
# 2  'INT'         type='int'
#                    length=1
#                    'nopnt'  'nowl'    'mbound'  'nwnd'    'nwnd'

```

```

        'ibroco'      length=4   length='*/mesh/idimen/noroco'
        'ilgrwl'      type='int'  length='/kalman/int/nowl'
        'last'        length=1
#
# 2  'REAL'          type='real'
        'cortiw'      length=1
        'cortib'      'cortib'
        'last'        length=1
#
# 2  'GAIN'          type='real'
        'gainsp'      length='*/kalman/int/nowl'
        'gainu'        'gainv'        'gainwu'        'gainwv'
        'gainb'       length='/kalman/int/nowl'
        'last'        length=1
        'gainb0'      length='*/kalman/int/mbound'
        'gainb0'      length='/kalman/int/nowl'
        'last'        length=1
        'gainb0'      length=1
        'gainb0'      length='/mesh/idimen/mnmaxk'

```


APPENDIX E LOG SHEET

Document version	Date	Program Version	Changes with respect to previous version
1.01	15-02-94	1.01	Initial version
1.10	15-09-98	1.01	Adaptations for making pretty HTML pages with W2W
1.11	16-09-'10		Adobs removed