GKA_Version40_100114_en.txt 14.01.2010
gka interface description

File Name
=========

;gka files are saved daily. From the beginning of the data recording a file for every day is expected.
;File gaps are not accepted and force the permanent network adjustment of the monitoring mode to stop.
;the file name of a gka-file is build as follows:
;yymmdd.gka   with yy = 2-digit year
;   mm = 2-digit month
;   dd = 2-digit day

;optional:
;yymmdd_TSn.gka with n = consecutive numbering, starting with 1; n could be any number, but a hard
;   coded limit of n = 5 is defined, which has to be encreased if necessary.

;Example:
;100114_TS1.gka

==
Classical GOCA GPS-Datasets (Standard from Version 1.0 to Version 3.4; optional from Version 4.0)
==

#GOKA00, Ref, X, Y, Z, hRef

; Ref   = Name of the reference station (maximum 12-digit string)
; X   = Cartesian geocentric ITRF-coordinates X [m] after the last initialisation
; Y   = Cartesian geocentric ITRF-coordinates Y [m] after the last initialisation
; Z   = Cartesian geocentric ITRF-coordinates Z [m] after the last initialisation
; hRef = Antenna height of reference

;Example:
#GOKA00,RefA,3853366.1405,999414.7537,4966806.5926,0.000000

#GOKA01, t, IRef, IRov, X_t, Y_t, Z_t, ISat, RDOP, Iobs, sl, sh, s0, s, q_xx, q_xy, q_xz, q_yy, q_yz,
q_zz, Ifix, Mode

; t   = GPS-seconds of observation time point (seconds of the week fromsunday 00:00)
; IRef = 12-digit name of the reference station
; IRov = 12-digit name of the rover station
; X_t   = Cartesian geocentric ITRF-coordinates X [m] at time t
; Y_t   = Cartesian geocentric ITRF-coordinates Y [m] at time t
; Z_t   = Cartesian geocentric ITRF-coordinates Z [m] at time t
; ISat = number of used satellites during observation
; RPDOP = RDOP-value of the observation (relative PDOP)
; Iobs = number of observations used for this solution
; sl   = receiver estimated plane accuracy [m]
; sh   = receiver estimated height accuracy [m]
; s0   = Sigma a priori   [-]
; s   = Sigma a posteriori   [-]
; c_xx = cofactor c_xx*1000
; c_xy = cofactor c_xy*1000
; c_xz = cofactor c_xz*1000
; c_yy = cofactor c_yy*1000
; c_yz = cofactor c_yz*1000
; c_zz = cofactor c_zz*1000
; Fix   = 'I'= fixed,   'F'= float
; Mode = 'S'=static, 'K'=kinematic

;Example:
#GOKA01,459280,RefA,MP1,3853541.7370,999323.5003,4966621.0865,8,0.12,657,0.001,0.003,0.02777,0.02804,
0.001396,0.000031,0.003124,0.000318,0.000386,0.009511,I,S

#GOKA02, IRov, X, Y, Z, hrov
; IRov = Name of rover (maximum 12-digit string)
; X   = Cartesian geocentric ITRF-coordinates X [m] after the last initialisation
; Y   = Cartesian geocentric ITRF-coordinates Y [m] after the last initialisation
; Z   = Cartesian geocentric ITRF-coordinates Z [m] after the last initialisation
; hrov = Antenna height of rover

```
;Example:
#GOKA02,MP1,3853541.7282,999323.4974,4966621.0625,0.000000


================================================================================================
New GOCA Datasets (Standard from Version 4.0)
================================================================================================

File Characteristics
==============

;A daily file starts with the string "Version", followed by a 2-digit number representing the
;gka file version.

;The end of observations in a file is represented by the string "Ende" or "End".

;A comment starts with ';' end ends with a line end.

;Blank lines are accepted.

;The several gka block types end with "ENDnn" where nn = block type id.

;The GPS day start with 0 = sunday, 1= monday , ... , 6 = saturday.

;The GPS seconds start daily with 0.00.

;It is possible to omit optional paramaters instead of using "dummy"-values.

;Currently excenter values can be read but not proccessed.



GKA-Block Types
==============


================================================================
#GOCA10 ; approximation cootrdinates for the GOCA network adjustment
Pktnr,GPS_ww, GPS_d, GPS_ss, Itype, X, Y, Z, B0, L0, h0
#END10
================================================================

; Pktnr  = Point name (maximum 12-digit string)
; GPS_ww = GPS-week
; GPS_d  = GPS-weekday
; GPS_ss = GPS-seconds
; Itype  = 1 for cartesian geocentric ITRF-coordinates
;        = 2 for geographic ITRF-coordinates
;        = 3 for topocentric cartesian system
;        = 4 for UTM in the ITRF-frame based on WGS84-ellipsoid
;        = 5 for GK based on Bessel-ellipsoid
;        = 6 for Mercator based on WGS84-ellipsoid
; X      = Cartesian geocentric ITRF-coordinates X [m] for Itype = 1
;        = Geographic eastern [Altgrad decimal,WGS84-ellipsoid] for Itype =2
;        = v in topocentric system for Itype = 3
;        = E_UTM (Eastern) for UTM for Itype = 4
;        = E_GK (Eastern) for GK for Itype = 5
;        = E_Merc (Eastern) for Mercator for Itype = 6
; Y      = Cartesian geocentric ITRF-coordinates Y [m] for IType = 1
;        = Geographic northern [Altgrad decimal,WGS84-ellipsoid] for Itype = 2
;        = u in topocentric system for Itype = 3
;        = N_UTM (Northern) for UTM for Itype = 4
;        = N_GK (Northern) for GK for Itype = 5
;        = N_Merc (Northern) for Mercator for Itype = 6
; Z      = Cartesian geocentric ITRF-coordinates Z [m] for Itype = 1
;        = Ellipsoid height h  [WGS84-ellipsoid]
;        = w in topocentric system for Itype = 3
;        = Geoid height H for UTM for Itype = 4
;        = Geoid height H for GK for Itype = 5
;        = Geoid height H for Mercator for Itype = 6
; B0     = Geographic eastern [Altgrad Dezimal,WGS84-ellipsoid], only with topocentrics system
; L0     = Geographic northern [Altgrad Dezimal,WGS84-ellipsoid], only with topocentrics system
; h0     = Ellipsoid height [m], only with topocentrics system
```

```
; #END10 = End of GKA-Block Type 10

;Example:
#GOKA10
001, 1458,4,86130.5,1,3853541.7370,999323.5003,4966621.0865
002, 1458,4,86130.5,1,3853366.1405,999414.7537,4966806.5926
#END10


================================================================
#GOKA11 ; LPS-Totalstation data
; Totalstation information
P_tach, Descr, orient, nsatzr, nsatzz, h_tach, I_extach, EX_tach, EY_tach,
EZ_tach
; Target observation
P_targ, Descr, GPS_ww, GPS_d, GPS_ss, nSatz, npos, s, ss, h_s, r, sr, z, sz, h_z, sadd, refr, bre,
I_extar, EX_s, EY_s, EZ_s, EX_r, EY_r, EZ_r, EX_z, EY_z,
EZ_z
; following observations
#END11
================================================================

; P_tach    = Point name of total station (maximum 12-digit String)
; Descr     = Description (maximum 12-digit string)
; orient    = 0 keep Orientation unknown
;           = 1 estimate new orientation unkown
; nsatzr    = Number of direction and distance data sets to average
;           = 0/1 no set proccessing
;           = 2 always 2 data sets will be averaged previous network adjustment
;           = 3 always 3 data sets will be averaged previous network adjustment
;           = ...
; nsatzz    = Number of zenith angle sets to average;
;           = 0/1 no set proccessing
;           = 2 always 2 data sets will be averaged previous network adjustment
;           = 3 always 3 data sets will be averaged previous network adjustment
;           = ...
; h_tach    = Instrument height
;
;
---- Optional Parameters ------------------------------------------------------------------
---- The following excenter data is only saved if existing, otherwise keep fields empty ---------
; I_extach  =  1 for geocentric cartesian coordinates
;           =  2 for geographic ITRF-coordinates
;           =  3 for topocentric cartesians system
; EX_tach   = X Cartesian geocentric ITRF-coordinates X [m] for I_extach = 1
;           = B geographic eastern [Altgrad decimal,WGS84-ellipsoid] for I_extach = 2
;           = u for I_extach = 3
; EY_tach   = Cartesian geocentric ITRF-coordinates Y [m] for I_extach = 1
;           = Geographic northern [Altgrad decimal,WGS84-ellipsoid] for I_extach =2
;           = v for I_extach = 3
; EZ_tach   = Cartesian geocentric ITRF-coordinates Z [m] for I_extach = 1
;           = Ellipsoid height h  [WGS84-ellipsoid] for I_extach =2
;           = w for I_extach = 3

; P_targ    = Point name of target (maximum 12-digit string)
; Descr     = Description (maximum 12-digit string)
; GPS_ww    = GPS-week of observation time point
; GPS_d     = GPS-weekday
; GPS_ss    = GPS-seconds
; n_Satz    = Set number, starting with 1, incremented with 1 for each new set
; npos      = 0 direction / zenith angle already corrected from instrument errors
;           = 1 "Face 1" (if Face 1 then Face 2 is exptected)
;           = 2 "Face 2"

; s         = Direct distance [m]
; ss        = Standard deviation of the distance observation [m]
; h_s       = Reflector height for distance observation [m]

; r         = Direction[gon]
; sr        = Standard deviation of the direction observation [gon]

; z         = Zenith angle [gon]
; sz        = Standard deviation of the zenith angle [gon]
; h_z       = Reflector height for zenith angle observation [gon]
```

```
;
- Optional Parameters ------------------------------------------------------------------------
- This data (Add.constant;Refraction;Excenter) is only saved if existing, otherwise keep fields empty -

; sadd      = Prism constant
; refr      = Refraction coefficient k for zenith angle and direct distance
; bre       = refraction n in ppm
;
; I_extar   =  1 for geocentric cartesian coordinates
;           =  2 for geographic ITRF-coordinates
;           =  3 for topocentric cartesian system
; EX_tar    = X Cartesian geocentric ITRF-coordinates X [m] for I_extach = 1
;           = B geographic eastern [Altgrad Dezimal,WGS84-ellipsoid] for I_extach = 2
;           = u for I_extach = 3
; EY_tar    = Cartesian geocentric ITRF-coordinates Y [m] for I_extach = 1
;           = Geographic northern [Altgrad Dezimal,WGS84-ellipsoid] for I_extach =2
;           = v for I_extach = 3
; EZ_tar    = Cartesian geocentric ITRF-coordinates Z [m] for I_extach = 1
;           = ellipsoid height h  [WGS84-ellipsoid] for I_extach =2
;           = w for I_extach = 3

; #END11    = End of GKA-Block Type 11

;Example:
#GOKA11
S1,11012,0,2,2,0.0000,1,0.0000,0.0000,0.0000
1,Prism 1,1458,4,35151.0,1,1,2.5092,0.0002,0.0000,17.370400,0.00090,63.167900,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
2,Prism 2,1458,4,35158.0,1,1,2.3496,0.0001,0.0000,370.637700,0.00090,71.602800,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
1,Prism 1,1458,4,35178.6,1,2,2.5098,0.0001,0.0000,217.417300,0.00090,336.797800,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
2,Prism 2,1458,4,35185.7,1,2,2.3483,0.0002,0.0000,170.658400,0.00090,328.387100,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
1,Prism 1,1458,4,35206.3,2,1,2.5108,0.0002,0.0000,17.379900,0.00090,63.167900,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
2,Prism 2,1458,4,35213.4,2,1,2.3484,0.0001,0.0000,370.635500,0.00090,71.604500,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
1,Prism 1,1458,4,35234.2,2,2,2.5102,0.0001,0.0000,217.423000,0.00090,336.798200,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
2,Prism 2,1458,4,35241.3,2,2,2.3489,0.0003,0.0000,170.659100,0.00090,328.388100,0.00090,0.0000,0.0000,
0.13,0.0,1,0.0000,0.0000,0.0000
#END11
;As nsatzr = 2 and nsatzz = 2 both data sets will be averaged to one data set before the network
;adjustment.


================================================================
#GOKA12; LPS-Height differences (level, barometric level,...)
P1, P2, Descr, GPS_ww, GPS_d, GPS_ss, DH, sDH, H_ExP1, H_ExP2
#End12
================================================================

; P1        = Point name of station point (maximumj 12-digit string)
; P2        = Point name of target point (maximum 12-digit String)
; Descr     = Description
; GPS_ww    = GPS-week of observation time point
; GPS_d     = GPS-weekday
; GPS_ss    = GPS-seconds
; DH        = Height difference [m]
; sDH       = Standard deviation of the height difference observation [m]

---- Optional Parameters ------------------------------------------------------------------------
---- The following excenter data is only saved if existing, otherwise keep fields empty ---------
; h_ExP1    =  Height excenter of P1 [m]
; h_ExP2    =  Height excenter of P2 [m]

; #END12    =  End of GKA-Block Type 12

;Example:
#GOKA12
001, 445, Nivel, 1458, 5, 36000, 146.201, 0.001
002, 001, Nivel, 1458, 5, 36000,   0.000, 0.001
#END12
```

```
================================================================
#GOKA13; GPS-Session (including uncorrelated Baseline)
BASE, Descr, X_BASE, Y_BASE, Z_BASE, h_BASE, N_Rover, N_Sess_Type, I_EX_BASE, EX_BASE, EY_BASE,
EZ_BASE
; N_Rover rows
ROV, Descr, GPS_ww, GPS_d, GPS_ss, X_ROV, Y_ROV, Z_ROV, h_ROV, I_Status, I_Stat_Type, Stat_String,
I_ex_ROV, EX_ROV, EY_ROV, EZ_ROV
; 1 row
Sigma,QXX_MAT_VALUES
#END13
================================================================

; BASE       =  Point name of the GPS reference station
; Descr      =  Description
; X_BASE     =  ITRF-based geocentric cartesian X-coordinate [m]
; Y_BASE     =  ITRF-based geocentric cartesian Y-coordinate [m]
; Z_BASE     =  ITRF-based geocentric cartesian Z-coordinate [m]
; h_BASE     =  Antenna height of the base receiver
; N_Rover    =  Number of following GPS rover observations
; N_Sess_Type=  0 uncorrelated Baselines
;            =  1 fully correlated session
;
---- Optional Parameters ------------------------------------------------------------------------
---- The following excenter data is only saved if existing, otherwise keep fields empty ---------
; I_EX_BASE =  1 Excenter in cartesian geocentric ITRF-coordinates
;           =  2 Excenter in geographic ITRF-coordinates
;           =  3 Excenter in topocentric cartesian coordinates (u,v,w)
; EX_BASE   =  Excenter value 1 (X or B or u)
; EY_BASE   =  Excenter value 2 (Y or L or v)
; EZ_BASE   =  Excenter value 3 (Z or h or w)


; Single rover observation rows
; ROV        =  Point name of the GPS rover station
; Descr      =  Description
; GPS_ww     =  GPS-week of observation time point
; GPS_d      =  GPS-weekday
; GPS_ss     =  GPS-seconds
; X_ROV      =  ITRF-based geocentric cartesian X-coordinate [m]
; Y_ROV      =  ITRF-based geocentric cartesian Y-coordinate [m]
; Z_ROV      =  ITRF-based geocentric cartesian Z-coordinate [m]
; h_ROV      =  Antenna height of the rover receiver
; I_Status   =  No further proccessing information
;            =  N Number of data fields in the status string
; I_Stat_Type=  0 for I_Status = 0
;            =  1 for Trimble_RTK-information
;            =  2 for Leica_RTK-information
;            =  3 for Topcon_RTK-information
;            =  4 .... a.s.o.
; Stat_String=  Status_String with n data fields
;!!!Currently no status string is fully defined. Therefore I_Status and I_Status_Type only accept 0!!!
;
---- Optional Parameters ------------------------------------------------------------------------
---- The following excenter data is only saved if existing, otherwise keep fields empty ---------
; I_EX_ROV =  1 Excenter in cartesian geocentric ITRF-coordinates
;          =  2 Excenter in geographic ITRF-coordinates
;          =  3 Excenter in topocentric cartesian coordinates (u,v,w)
; EX_ROV   =  Excenter value 1 (X or B or u)
; EY_ROV   =  Excenter value 2 (Y or L or v)
; EZ_ROV   =  Excenter value 3 (Z or h or w)

; Variance factor and cofactor matrix
; Sigma      = Variance factor for the following cofactor matrix. The QXX_MAT-values represent the
; upper triangular matrix of the cofactor matrix.
; QXX_MAT    = 6 * N_ROV                      Qxx-Matrix-values for NSESS_TYP = 0
;            = 4.5*N_ROV*N_ROV + 1.5* N_ROV)   Qxx-Matrix-values for NSESS_TYP = 1
; The Covariance matrix Cxx = Sigma*Sigma*QXX_MAT
; Example for a single Baseline:
; Sigma = 0.0001 QXX = 0.0004  0.0002 0.0002
;                      0.0002  0.0004 0.0002
;                                       0.0002  0.0002 0.0004
; gka-string = 0.0001,0.0004,0.0002,0.0002,0.0004,0.0002,0.0004
```

; #END13   = End of GKA-Block Type 13

;Example:
;uncorrelated:
#GOKA13
3,,4143081.8910,622255.2536,4793380.1306,0.0000,2,0
1,,1490,2,35225.0000,4143312.9266,621911.6614,4793281.6465,0.0000,0,0
2,,1490,2,35225.0000,4143382.1840,621956.2613,4793220.9335,0.0000,0,0
0.001000,0.166611,0.022515,0.083306,0.058539,0.027018,0.195881,0.141091,0.013024,0.102020,0.039071,
0.026048,0.191015
#END13

;fully correlated:
#GOKA13
3,,4143081.8910,622255.2536,4793380.1306,0.0000,2,0
1,,1490,2,35225.0000,4143312.9266,621911.6614,4793281.6465,0.0000,0,0
2,,1490,2,35225.0000,4143382.1840,621956.2613,4793220.9335,0.0000,0,0
0.001000,0.126619,0.032101,0.087385,0.041018,0.007133,0.180121,0.210750,0.027096,0.177632,0.060214,
0.054193,0.340211,0.094044,0.030228,0.068854,0.048701,0.016794,0.196485,0.099853,0.030837,0.098384
#END13

GKA_Version40_100114_en.txt ends here