R2CGGTTS Documentation

Version 2.4.3

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I. Getting Started

1. Introduction

R2CGGTTS version 2.4.3 is a MICROSOFT WINDOWS software used to automate the conversion of RINEX daily data files in CGGTTS format files.

This program is designed in FORTRAN and VISUAL BASIC 6 language.

FORTRAN source code: It is the conversion code in itself.
It is written and updated by PASCALE DEFRAIGNE, Observatoire Royal de Belgique (ORB).
File used for R2CGGTTS version 2.4.3 is "RINEX_CGGTTS.f.V43".
This code generates the CGGTTS files in a MULTI-CHANNEL approach from RINEX files at a sampling rate of 30 seconds using broadcast orbits and P3 code.

VISUAL BASIC 6 source code:
It is the MICROSOFT WINDOWS environment to permit of a useful graphical user interface and an automatic run of the FORTRAN program (which is compiled with LAHEY/FUJITSU FORTRAN 95).

2. Operating System configuration

This software is written under MICROSOFT WINDOWS XP system.

Warning:

R2CGGTTS does not work under MICROSOFT WINDOWS NT4.

R2CGGTTS uses different settings of operating system as reference that must be configure properly:

Computer time:

You must set the computer time to UTC (within a few minutes).
Moreover, verify the computer date is correct.

Windows Regional Options:

Time format: "HH:mm:ss"
Short Date format: "dd/MM/yyyy"
Number decimal symbol: "." (point)

3. Installation

This version of R2CGGTTS can be installed without uninstall older version.

Get from our FTP server the files: "setup.exe", "setup.lst", and "r2cggtts.2.4.3.cab".

You can install the software on any computer that has access to the RINEX files either on a local drive or on a network drive.

Please see description of differents steps of installation in Annex I.

II. Program usage

A new shortcut will be created in your WINDOWS "Program menu". You can start the program either through it or by double clicking on the "r2cggtts.2.4.3.exe" file in path "C:\Program Files\r2cggtts 2.4.3\".
To exit the program, click on "Exit" menu of the program.

1. Parameter menu

All requested information in this menu are compulsory and must be filled before using other menu (restriction: no blank in field). To do so click in the field you want update, a new window will appear with a short explanation of what should be in the field. Please see an example of updated field in Annex II.

Summary of "CGGTTS header info" field:

Field name	**Description**	**Example**
REV DATE	date of the latest update of any of the header info parameters	"2002-05-28"
RCVR	receiver maker, type, serial number and other information relevant	"ASHTECH Z12T LP02944"
CH	receiver number of GPS channel	"12 (GPS)"
LAB	identify the laboratory name	"ORB"
X	enter X coordinate of the antenna phase centre in meters	"4203640.1300"
Y	enter Y coordinate of the antenna phase centre in meters	"162934.3540"
Z	enter Z coordinate of the antenna phase centre in meters	"4778196.4030"
FRAME	enter the frame in which the coordinates are expressed	"ITRF97"
COMMENTS	enter any particular comments about the set up	"no comments"
INT DLY (GPS P1)	enter the system (receiver + antenna) P1 internal delay, (X_R+X_S) in ns	"301.3"
INT DLY (GPS P2)	enter the system (receiver + antenna) P2 internal delay, (X_R+X_S) in ns	"313.7"
CAB DLY	enter the antenna cable delay, (X_C) in ns	"128.33"
REF DLY	enter the delay to Receiver reference, (X_P+X_O) in ns	"34.8"
REF	identify the laboratory reference	"UTC(ORB)"

Please see Annex V, "standard hardware setup", for more delay explanations.

Summary of “Rinex Info” field:

Field name	**Description**	**Example**
Observation File Name	enter the 4 characters IGS station code	“BIPC” (i.e. file is BIPC1680.05O)
Observation File Directory	enter the Rinex Observation data complete path name by clicking on “Browse” button	“d:\data\bipmc”
YYDOY subdirectory structure	select it if Rinex Observation data files are inside a YYDOY subdirectory structure where YY is two last digit of the year and DOY is day of year	-
Navigation File Name	enter the 4 characters IGS station code	“BRDC” (i.e. file is BRDC1680.05N)
Navigation File Directory	enter the Rinex Navigation data complete path name by clicking on “Browse” button	“d:\data\brdc”
YYDOY subdirectory structure	select it if Rinex Navigation data files are inside a YYDOY subdirectory structure where YY is two last digit of the year and DOY is day of year	-

Summary of “Other Info” field:

Field name	**Description**	**Example**
Laboratory Code	enter the 2 characters laboratory code (to get from the BIPM)	“BP”
Receiver Code	enter the 2 characters receiver code (your choice but must start with a number)	“01” or “0_” or “4D”
GPS time – UTC	enter the current value of [GPS time - UTC] in seconds	“15”
C1-P1 biases	select it if Rinex Observation data files are without P1 code. enter the complete path name, by clicking on “Browse” button, of the file “biasC1P1.dat”	- d:\

“Parameter” menu: (“Open” / “Save As”)

You can then either save your parameters as default or save them in a specific file.

You can retrieve a saved configuration file using the menu:
“Parameter” -> “Open” -> “File”
You can retrieve default configuration file using the menu:
“Parameter” -> “Open” -> “Default”

You can save configuration in a specific file using the menu:
“Parameter” -> “Save As” -> “File”
You can save configuration as default (launch by default at start up) using the menu:
“Parameter” -> “Save As” -> “Default”

NB: Informations from “Automatic Conversion” menu (ie FTP information or time of daily process, see below) are also saved with “Parameter” informations.

2. Conversion menu

2.1 Automatic menu

"Automatic Process" frame: (see Annex III)

Once the parameters are updated and saved, you can start the daily routine.
Program builds daily CGGTTS format files.

At the date J, it will process data from the date J-2 (files for J-1 are necessary).
The automation program runs the conversion code once a day at a configurable time (computer time).
Please make sure the RINEX files are available to the software at that time.

Press the "Run" button to launch "Automatic Process".
Press the "Stop" button to stop "Automatic Process".

At the end of the daily process, the status will be updated with the name of the latest CGGTTS processed file.

Summary of "Automatic Process" field:

Field name	**Description**	**Example**
CGGTTS output File Directory	enter the CGGTTS data storage complete path name by clicking on "Browse" button	"c:\data1"
Run once a day at … UTC	enter time which you want to run conversion, the first field is for hour, and the second field is for minute	"02:05" or "23:45"

"Automatic Data Transfer to FTP server" frame:

It can automatically transfer the CGGTTS files to a FTP server after the daily automatic process.

To activate the automatic FTP transfer, choose "Enable", before press the "Run" button.
To deactivate the automatic FTP transfer, choose "Disable", before press the "Run" button.

In program path "C:\Program Files\r2cggtts 2.4.3\" you will also find a log file for the latest FTP transfer.
(file name: "ftpXXYY.log" where XX is laboratory code and YY is receiver code).

Summary of "Automatic Data Transfer to FTP server" field:

Field name	**Description**	**Example**
Server	enter the IP or URL address of FTP server	62.161.69.131 (i.e. BIPM FTP server)
User Name	enter the login of FTP server	"labotai" (i.e. BIPM FTP server)
Password	enter the password of FTP server	"*******" (a)
Remote Path	enter the complete path where data will be transfer in FTP server, if not put "/"	"/" or "/data" (b)

If you want transfer CGGTTS file to BIPM FTP server with this program, please:
(a) contact BIPM to get password.
(b) put in "Remote Path" field: "/data/XXXX/links" where XXXX is the acronym of your laboratory given by BIPM.

2.2 Specific menu

Once the parameters are updated and saved, you can process any old batch of data. (see Annex IV)

Update field of output File Directory by clicking on “Browse” button.
Update field of first day of year (“first DOY” field) and the corresponding year (“year” field).
Update field of last day of year (“last DOY” field) and the corresponding year (“year” field).

If you want all output data in one file, please select “All output data in 1 file”.

Press the “Run” button to launch “Specific Process”.

Annex I

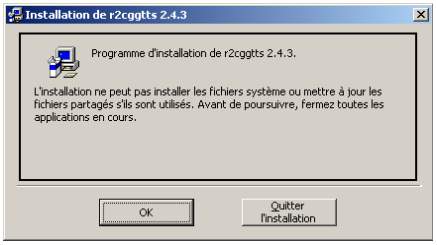
Installation steps

Unfortunately setup installation is in French but it is a standard MICROSOFT WINDOWS setup.

Run “setup.exe”:

- Step 1:

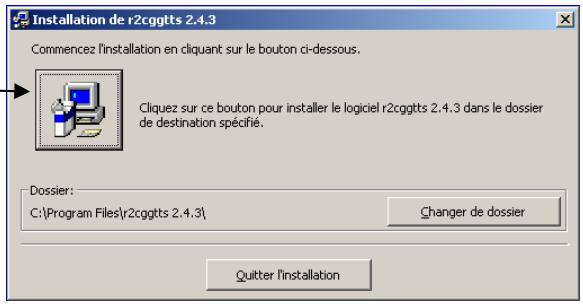
  click on “OK”.



- Step 2:

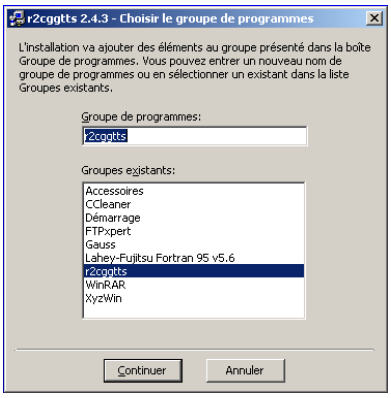
  click here :

Warning,
Do not change default path,
“**C:\Program Files\r2cggtts 2.4.3**”.



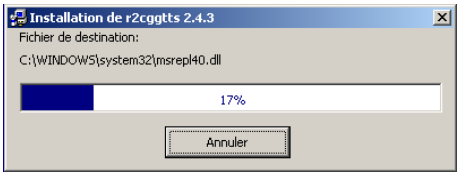
- Step 3:

  click on “continuer”.



- Step 4:

  Wait...

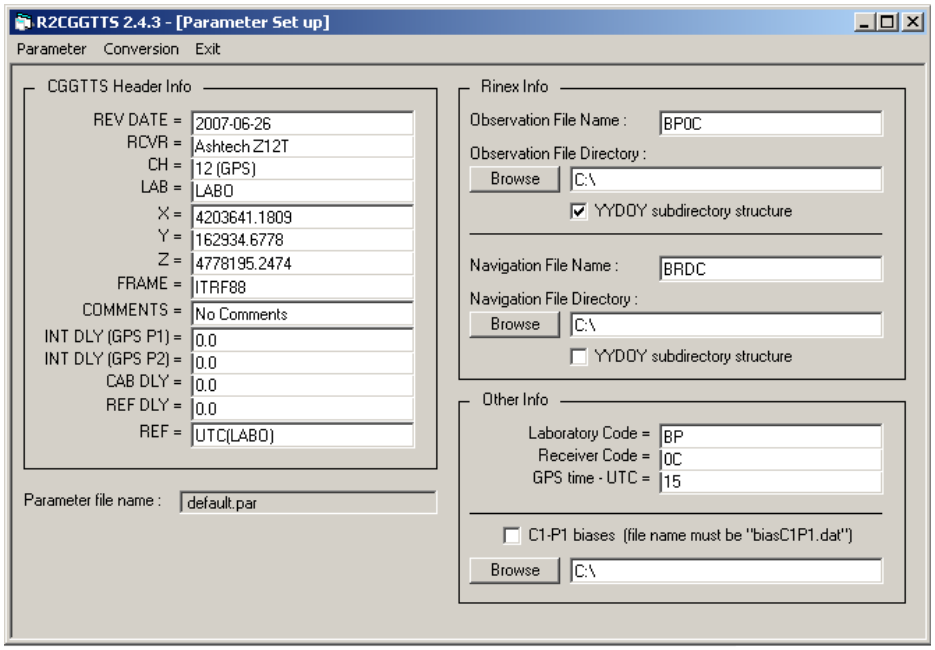


- Step 5:

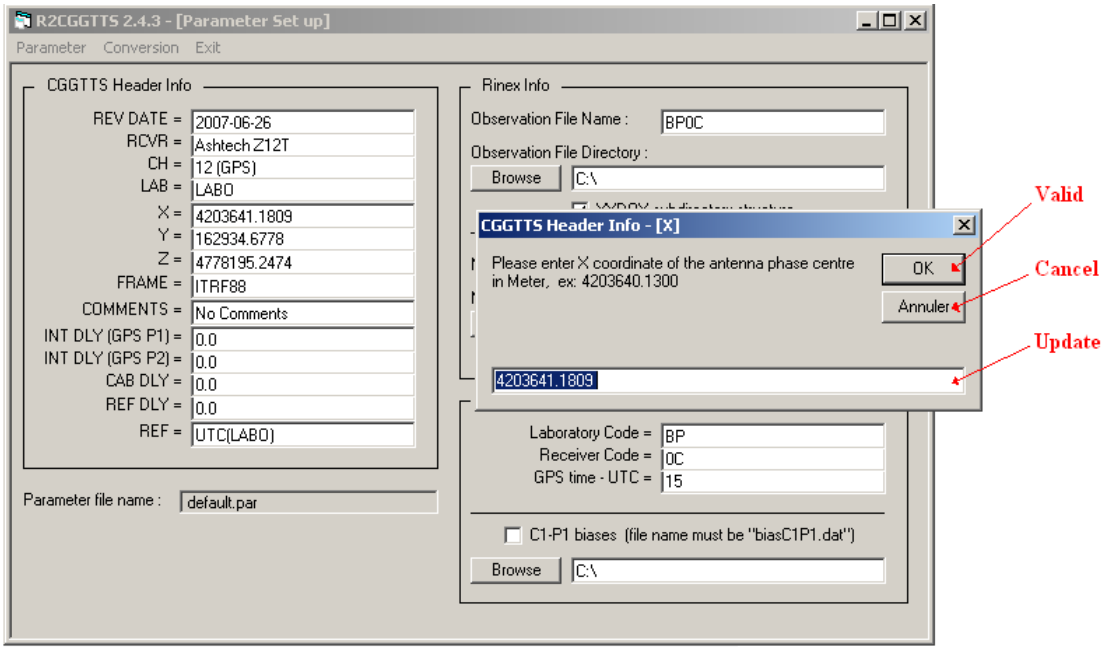
  click on “OK”, it is finish.

Annex II

Parameter set up menu

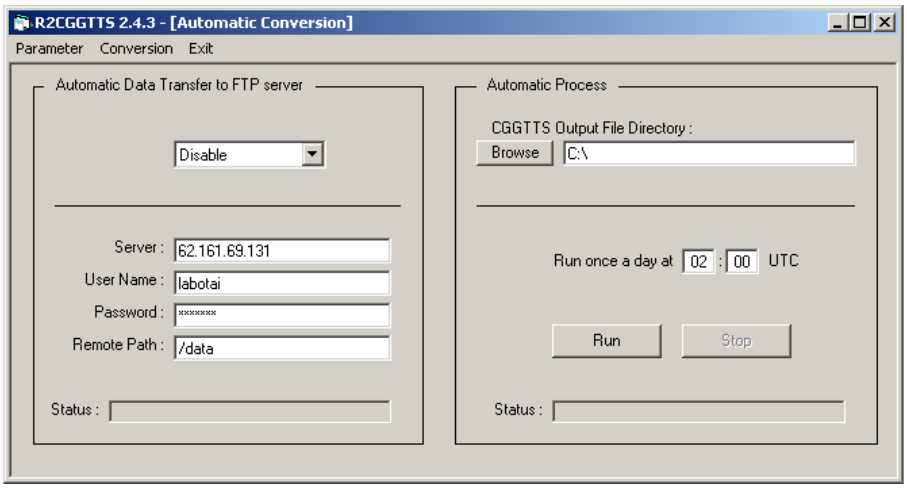


Example of updated field



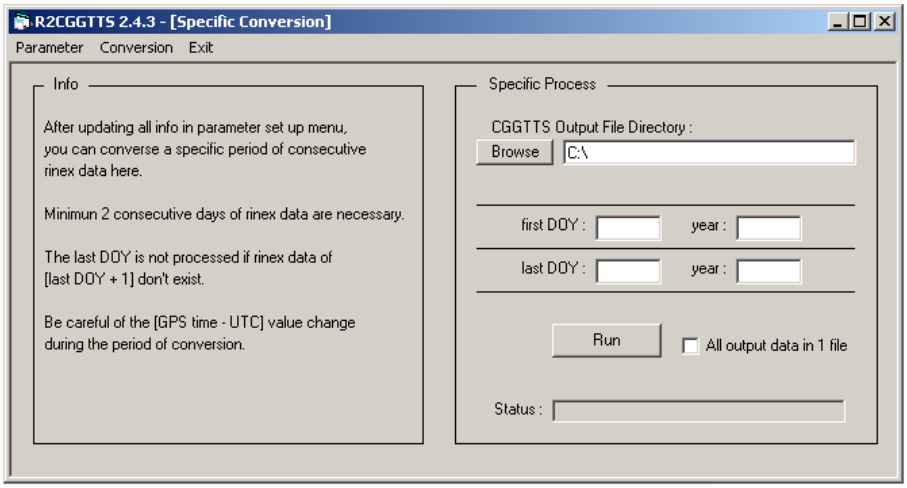
Annex III

Automatic conversion menu



Annex IV

Specific conversion menu



Annex V

Standard hardware set up

Delays Definitions:

X_P = Delay of the 1PPS-in to the laboratory reference
X_O = Delay of the "internal reference" to the 1PPS-in
X_R = receiver internal delay, measured from the "internal reference"
X_C = antenna cable delay
X_S = antenna delay

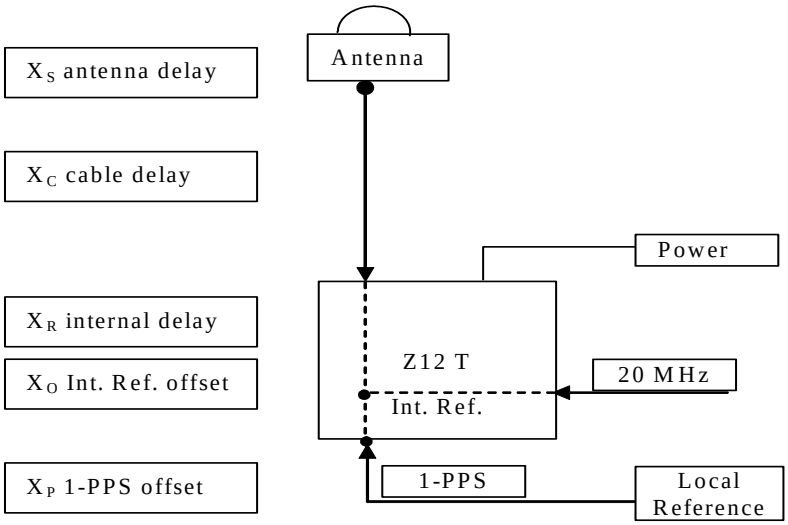


Figure: Definition of the different delays used in a typical set up.

The precise definition the "internal reference", to which the GPS measurements are referred, is given in (Petit et al., Progresses in the calibration of geodetic like GPS receivers for accurate time comparisons, *Proc. 15th EFTF*, 2001, 164-166.).
The values of X_P, X_O, X_C are to be measured at each new set up. The values of X_R and X_S are the calibration results.