

One_Sgp4

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Chapter 1

Namespace Index

1.1 Namespace List

Here is a list of all documented namespaces with brief descriptions:

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Chapter 2

Hierarchical Index

2.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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| One_Sgp4.Coordinate | 10 |
| One_Sgp4.DeepSpaceObjects | 12 |
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Chapter 3

Class Index

3.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

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| InView Class definition | 9 |
| One_Sgp4.Coordinate | |
| GeoCoordinate class | 10 |
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Chapter 4

Namespace Documentation

4.1 Package One_Sgp4

Classes

- class [calculateContacts](#)
InView Class definition.
- class [Coordinate](#)
GeoCoordinate class.
- class [DeepSpaceObjects](#)
- class [Enum](#)
- class [EpochTime](#)
- class [NearEarthObjects](#)
- class [ParserTLE](#)
- class [Point3d](#)
- class [Sgp4](#)
- class [Sgp4Data](#)
- class [Sgp4Rec](#)
- class [Tle](#)
- class [WebTleLoader](#)
- class [WGS_72](#)
- class [WGS_84](#)

Chapter 5

Class Documentation

5.1 One_Sgp4.calculateContacts Class Reference

InView Class definition.

Public Member Functions

- [calculateContacts](#) ()
Ground constructor.

Static Public Member Functions

- static bool [calcContactWindows](#) ([Coordinate](#) coordinate, double minElevation, [EpochTime](#) time, [Sgp4Data](#) satPosData)
Calculate ContactWindows for satellite and groundstations.
- static [Point3d](#) [calcSphericalCoordinate](#) ([Coordinate](#) coordinate, [EpochTime](#) time, [Sgp4Data](#) satPosData)
Calculate Range, Azimuth and elevation for satellite.

Public Attributes

- const double [pi](#) = Math.PI
double constant Pi
- const double [twoPi](#) = [pi](#) * 2.0
double constant two Pi
- const double [toDegrees](#) = 180.0 / [pi](#)
double constant conversion to degree
- const double [toRadians](#) = [pi](#) / 180.0
double constant conversion to radians

5.1.1 Detailed Description

InView Class definition.

This class calculates the contact windows and/or the Spherical Coordinates for each satellite to every groundstation. For this the position vector of the satellite and the coordinates of the groundstation need to be available. From the starting time of the orbit calculation the azimuth, elevation and range to the ground station are calculated and if the satellite is in view a new ContactWindow will be created.

5.1.2 Constructor & Destructor Documentation

5.1.2.1 One_Sgp4.calculateContacts.calculateContacts () [inline]

Ground constructor.

Empty constructor

5.1.3 Member Function Documentation

5.1.3.1 static bool One_Sgp4.calculateContacts.calcContactWindows (**Coordinate** *coordinate*, double *minElevation*, **EpochTime** *time*, **Sgp4Data** *satPosData*) [inline],[static]

Calculate ContactWindows for satellite and groundstations.

Parameters

| | |
|------------------------------|--|
| <i>Station</i> | to calculate if satellite is in View |
| <i>TimeDate</i> | start time |
| <i>List<Sgp4↔Data></i> | satellite position vector |
| <i>string</i> | name of the satellite |
| <i>double</i> | tick in witch time is increased by each step |

Returns

true if object is visible at given time and current location

5.1.3.2 static Point3d One_Sgp4.calculateContacts.calcSphericalCoordinate (**Coordinate** *coordinate*, **EpochTime** *time*, **Sgp4Data** *satPosData*) [inline],[static]

Calculate Range, Azimuth and elevation for satellite.

Parameters

| | |
|------------------------------|--|
| <i>Station</i> | to calculate if satellite is in View |
| <i>TimeDate</i> | start time |
| <i>List<Sgp4↔Data></i> | satellite position vector |
| <i>string</i> | name of the satellite |
| <i>double</i> | tick in witch time is increased by each step |

Returns

[Point3d](#) containing range, azimuth, elevation

The documentation for this class was generated from the following file:

- One_Sgp4/ContactWindow.cs

5.2 One_Sgp4.Coordinate Class Reference

GeoCoordinate class.

Public Member Functions

- [Coordinate](#) (double _latetude, double _longitude, double _height=0.0)
GeoCoordinate constructor.
- string [toString](#) ()
Returns the GeoCoordinates as a string.
- double [getLatetude](#) ()
Returns the Latetude.
- double [getLongitude](#) ()
Returns the Longitude.
- double [getHeight](#) ()
Returns the height.
- [Point3d toECI](#) (double siderealTime)
Convert to ECI.

Public Attributes

- const double [pi](#) = Math.PI
double constant Pi
- const double [twoPi](#) = [pi](#) * 2.0
double constant two Pi
- const double [toDegrees](#) = 180.0 / [pi](#)
double constant conversion to degree
- const double [toRadians](#) = [pi](#) / 180.0
double constant conversion to radians

5.2.1 Detailed Description

GeoCoordinate class.

This class defines the GeoCoordinates of Latetude, Longitude, hight and the conversions to Earth Centerd Inertial.

5.2.2 Constructor & Destructor Documentation

5.2.2.1 One_Sgp4.Coordinate.Coordinate (double _latetude, double _longitude, double _height = 0.0) [inline]

GeoCoordinate constructor.

Parameters

| | |
|---------------|-------------------|
| <i>double</i> | latetude |
| <i>double</i> | longitude |
| <i>double</i> | hight default 0.0 |

5.2.3 Member Function Documentation

5.2.3.1 double One_Sgp4.Coordinate.getHeight () [inline]

Returns the height.

Returns

double height

5.2.3.2 `double One_Sgp4.Coordinate.getLatetude () [inline]`

Returns the Latetude.

Returns

double Latetude

5.2.3.3 `double One_Sgp4.Coordinate.getLongitude () [inline]`

Returns the Longitude.

Returns

double longitude

5.2.3.4 `Point3d One_Sgp4.Coordinate.toECI (double siderealTime) [inline]`

Convert to ECI.

Parameters

| | |
|---------------|-------------|
| <i>double</i> | SidrealTime |
|---------------|-------------|

Returns

point3D ECI-Position vector of the [Coordinate](#)

5.2.3.5 `string One_Sgp4.Coordinate.toString () [inline]`

Returns the GeoCoordinates as a string.

Returns

string GeoCoordinate

The documentation for this class was generated from the following file:

- One_Sgp4/Coordinate.cs

5.3 One_Sgp4.DeepSpaceObjects Class Reference

Public Attributes

- int **dso_irez**
- double **dso_d2201**
- double **dso_d2211**
- double **dso_d3210**
- double **dso_d3222**
- double **dso_d4410**
- double **dso_d4422**
- double **dso_d5220**
- double **dso_d5232**

- double **dso_d5421**
- double **dso_d5433**
- double **dso_dedt**
- double **dso_del1**
- double **dso_del2**
- double **dso_del3**
- double **dso_didt**
- double **dso_dmdt**
- double **dso_dnodt**
- double **dso_domdt**
- double **dso_e3**
- double **dso_ee2**
- double **dso_peo**
- double **dso_pgho**
- double **dso_pho**
- double **dso_pinco**
- double **dso_plo**
- double **dso_se2**
- double **dso_se3**
- double **dso_sgh2**
- double **dso_sgh3**
- double **dso_sgh4**
- double **dso_sh2**
- double **dso_sh3**
- double **dso_si2**
- double **dso_si3**
- double **dso_sl2**
- double **dso_sl3**
- double **dso_sl4**
- double **dso_gsto**
- double **dso_xfact**
- double **dso_xgh2**
- double **dso_xgh3**
- double **dso_xgh4**
- double **dso_xh2**
- double **dso_xh3**
- double **dso_xi2**
- double **dso_xi3**
- double **dso_xl2**
- double **dso_xl3**
- double **dso_xl4**
- double **dso_xlamo**
- double **dso_zmol**
- double **dso_zmos**
- double **dso_atime**
- double **dso_xli**
- double **dso_xni**

The documentation for this class was generated from the following file:

- One_Sgp4/DeepSpaceObjects.cs

5.4 One_Sgp4.Enum Class Reference

Public Types

- enum [satClass](#) { [satClass.UNCLASSIFIED](#) = 0, [satClass.CLASSIFIED](#) = 1, [satClass.SECRET](#) = 2 }
Enum Satellite class.

5.4.1 Member Enumeration Documentation

5.4.1.1 enum One_Sgp4.Enum.satClass

[Enum](#) Satellite class.

This class defines the classification of the Satellites as defined in TLE dokumentation

Enumerator

UNCLASSIFIED int 0 unclassified satellite
CLASSIFIED int 1 classified satellite
SECRET int 2 secret satellite

The documentation for this class was generated from the following file:

- One_Sgp4/Enum.cs

5.5 One_Sgp4.EpochTime Class Reference

Public Member Functions

- [EpochTime](#) (int h, int m, double s, int yyyy, int mm, int dd)
EpochTime constructor.
- [EpochTime](#) (DateTime _dateTime)
EpochTime constructor.
- [EpochTime](#) ([EpochTime](#) _EpochTime)
EpochTime constructor.
- [EpochTime](#) (int epochYear, double EpochDay)
EpochTime constructor.
- double [getLocalSiderealTime](#) (double longitude=0.0)
returns the local Sidreal Time at a given Longitude
- double [getDayOfYear](#) ()
returns the Day of the Year and time as fraction of a day
- override string [ToString](#) ()
returns the current time as readable string
- void [addTick](#) (double tick)
adds an tick in seconds on current time
- int [getHour](#) ()
returns the hour of this object
- int [getMin](#) ()
returns the minute of this object
- double [getSec](#) ()
returns the second of this object
- int [getYear](#) ()

- returns the year of this object*
- int [getMonth](#) ()
returns the month of this object
- int [getDay](#) ()
returns the Day of this object
- double [getEpoch](#) ()
returns the epoch of this object
- DateTime [toDateTime](#) ()
convert to DateTime
- double [toJulianDate](#) ()
Returns the Date and Time in JulianDate.

Public Attributes

- const double [toRadians](#) = Math.PI / 180.0
double constant conversion to radians

5.5.1 Constructor & Destructor Documentation

5.5.1.1 One_Sgp4.EpochTime.EpochTime (int *h*, int *m*, double *s*, int *yyyy*, int *mm*, int *dd*) [inline]

[EpochTime](#) constructor.

Parameters

| | |
|---------------|--|
| <i>int</i> | hour |
| <i>int</i> | minutes |
| <i>double</i> | seconds |
| <i>int</i> | Year |
| <i>int</i> | Month |
| <i>int</i> | Day Constructs EpochTime with current Time in UTC and Date |

5.5.1.2 One_Sgp4.EpochTime.EpochTime (DateTime *dateTime*) [inline]

[EpochTime](#) constructor.

Parameters

| | |
|-----------------|--|
| <i>DateTime</i> | Constructs EpochTime from DateTime object local time |
|-----------------|--|

5.5.1.3 One_Sgp4.EpochTime.EpochTime (EpochTime *EpochTime*) [inline]

[EpochTime](#) constructor.

Parameters

| | |
|------------------|--|
| <i>EpochTime</i> | Constructs EpochTime from EpochTime Object |
|------------------|--|

5.5.1.4 One_Sgp4.EpochTime.EpochTime (int *epochYear*, double *EpochDay*) [inline]

[EpochTime](#) constructor.

Parameters

| | |
|---------------|--|
| <i>int</i> | epoch year |
| <i>double</i> | epoch day Constructs EpochTime from epoch year and day |

5.5.2 Member Function Documentation

5.5.2.1 void One_Sgp4.EpochTime.addTick (double *tick*) [inline]

adds an tick in seconds on current time

Parameters

| | |
|---------------|--|
| <i>double</i> | tick with each tick the time is increased until 365 days (366 days if current year is a leap year) then the epoch will be set to 0.0 and the year is counted up. |
|---------------|--|

5.5.2.2 int One_Sgp4.EpochTime.getDay () [inline]

returns the Day of this object

Returns

int day

5.5.2.3 double One_Sgp4.EpochTime.getDayOfYear () [inline]

returns the Day of the Year and time as fraction of a day

Returns

double DayOfYear

5.5.2.4 double One_Sgp4.EpochTime.getEpoch () [inline]

returns the epoch of this object

Returns

double epoch

5.5.2.5 int One_Sgp4.EpochTime.getHour () [inline]

returns the hour of this object

Returns

int Hour

5.5.2.6 double One_Sgp4.EpochTime.getLocalSiderealTime (double *longitude* = 0.0) [inline]

returns the local Sidreal Time at a given Longitude

Returns

double local Sidreal Time

5.5.2.7 int One_Sgp4.EpochTime.getMin () [inline]

returns the minute of this object

Returns

int minute

5.5.2.8 int One_Sgp4.EpochTime.getMonth () [inline]

returns the month of this object

Returns

int month

5.5.2.9 double One_Sgp4.EpochTime.getSec () [inline]

returns the second of this object

Returns

double seconds

5.5.2.10 int One_Sgp4.EpochTime.getYear () [inline]

returns the year of this object

Returns

int year

5.5.2.11 DateTime One_Sgp4.EpochTime.toDateTime () [inline]

convert to DateTime

Returns

DateTime time

5.5.2.12 double One_Sgp4.EpochTime.toJulianDate () [inline]

Returns the Date and Time in JulianDate.

Returns

double JulianDate

5.5.2.13 `override string One_Sgp4.EpochTime.ToString () [inline]`

returns the current time as readable string

Returns

string Time HH:MM:SS.ss

The documentation for this class was generated from the following file:

- One_Sgp4/EpochTime.cs

5.6 One_Sgp4.NearEarthObjects Class Reference

Public Attributes

- int **neo_isimp**
- int **neo_method**
- double **neo_aycof**
- double **neo_con41**
- double **neo_cc1**
- double **neo_cc4**
- double **neo_cc5**
- double **neo_d2**
- double **neo_d3**
- double **neo_d4**
- double **neo_delmo**
- double **neo_eta**
- double **neo_argpdot**
- double **neo_omgcof**
- double **neo_sinmao**
- double **neo_t**
- double **neo_t2cof**
- double **neo_t3cof**
- double **neo_t4cof**
- double **neo_t5cof**
- double **neo_x1mth2**
- double **neo_x7thm1**
- double **neo_mdot**
- double **neo_omegadot**
- double **neo_xlcof**
- double **neo_xmcof**
- double **neo_omegacf**

The documentation for this class was generated from the following file:

- One_Sgp4/NearEarthObjects.cs

5.7 One_Sgp4.ParserTLE Class Reference

Public Member Functions

- [ParserTLE \(\)](#)
ParseTle class.

Static Public Member Functions

- static [Tle](#) [parseTle](#) (string tleLine1, string tleLine2, string tleName=null)
Reads TwoLineElement data and converts it to [Tle](#).
- static List< [Tle](#) > [ParseFile](#) (string filename)
Parse TLE Data from File.
- static bool [isValid](#) (string line1)
Validate TLE Data against checksum.

5.7.1 Constructor & Destructor Documentation

5.7.1.1 One_Sgp4.ParserTLE.ParserTLE () [inline]

ParseTle class.

This class handles the reading and converting of TLE information either reading each single element from a string or by giving it a txt file. TleParser constructor.

5.7.2 Member Function Documentation

5.7.2.1 static bool One_Sgp4.ParserTLE.isValid (string line1) [inline], [static]

Validate TLE Data against checksum.

string [Tle](#) line

Returns

bool true if tle line matches up to checksum The sum of all numbers with minus seen as 1 and 0 for characters and whitespaces mod 10 must match up with the checksum

5.7.2.2 static List<Tle> One_Sgp4.ParserTLE.ParseFile (string filename) [inline], [static]

Parse TLE Data from File.

string filepath

Returns

list<Tle> Two Line Element Data list

5.7.2.3 static Tle One_Sgp4.ParserTLE.parseTle (string tleLine1, string tleLine2, string tleName = null) [inline], [static]

Reads TwoLineElement data and converts it to [Tle](#).

Parameters

| | |
|---------------|--|
| <i>string</i> | Line 1 |
| <i>string</i> | Line 2 |
| <i>string</i> | Name = null if name = null then International Designator is taken as name Example NOAA 14 1 23455U 94089A 15094.47912277 .00000079 00000-0 64323-4 0 9995 2 23455 98.7542 177.4401 0008423 292.6752 195.2467 14.14031457 45115 |

Returns

[Tle](#) tle-Class

The documentation for this class was generated from the following file:

- [One_Sgp4/ParserTLE.cs](#)

5.8 One_Sgp4.Point3d Class Reference

Public Attributes

- double [x](#)
Point3D class.

5.8.1 Member Data Documentation

5.8.1.1 double One_Sgp4.Point3d.x

Point3D class.

This class defines a 3-Dimensional point with double< x,y,z >

The documentation for this class was generated from the following file:

- [One_Sgp4/Point3d.cs](#)

5.9 One_Sgp4.Sgp4 Class Reference

Public Types

- enum [satClass](#) { [satClass.UNCLASSIFIED](#) = 0, [satClass.CLASSIFIED](#) = 1, [satClass.SECRET](#) = 2 }

Public Member Functions

- [Sgp4](#) ([Tle](#) data, int wgsConstant)
SGP4 constructor.
- void **setStart** ([EpochTime](#) starttime, [EpochTime](#) stoptime, double tick)
- void **starThread** ()
- void [clear](#) ()
clear all Data.
- void [runSgp4Cal](#) ([EpochTime](#) starttime, [EpochTime](#) stoptime, double step)
Run the sgp4 calculations.
- void **runSgp4Cal** (int startY, double starD, int stopY, double stopD, double step)
- void **sgp4Init** (int satn, int year, double epoch)
- void **initPropagator** (int satn, double ecco, double epoch, double inclo)
- double **gstime** (double jdut1)
- List< [Sgp4Data](#) > **getResults** ()
- void **setGrav** (int select)

Public Attributes

- const double [toRadians](#) = Math.PI / 180.0
double constant conversion to radians

Events

- EventHandler **ThreadDone**

5.9.1 Member Enumeration Documentation

5.9.1.1 enum One_Sgp4.Sgp4.satClass

Enumerator

UNCLASSIFIED int 0 unclassified satellite

CLASSIFIED int 1 classified satellite

SECRET int 2 secret satellite

5.9.2 Constructor & Destructor Documentation

5.9.2.1 One_Sgp4.Sgp4.Sgp4 (Tle data, int wgsConstant) [inline]

SGP4 constructor.

Parameters

| | |
|------------|--|
| <i>t/e</i> | Two Line Elements |
| <i>int</i> | GravConst 0 = WGS72, 1 = WGS82 initializes the Orbit-Calculation model |

5.9.3 Member Function Documentation

5.9.3.1 void One_Sgp4.Sgp4.clear () [inline]

clear all Data.

clears all calculated and stored data

5.9.3.2 void One_Sgp4.Sgp4.runSgp4Cal (EpochTime starttime, EpochTime stoptime, double step) [inline]

Run the sgp4 calculations.

Parameters

| | |
|---------------------------|---|
| EpochTime | starttime |
| EpochTime | stoptime |
| <i>double</i> | step in minutes calculates the orbit of the satellite starting from start to stoptime |

The documentation for this class was generated from the following file:

- One_Sgp4/Sgp4.cs

5.10 One_Sgp4.Sgp4Data Class Reference

Public Member Functions

- [Sgp4Data](#) (int satNr=-1)
SGP4-Data constructor.
- void [setSatNumber](#) (int Nr)
set the Satellite Number.
- void [setX](#) (double x)
set the X-Coordinate for Position.
- void [setY](#) (double y)
set the Y-Coordinate for Position.
- void [setZ](#) (double z)
set the Z-Coordinate for Position.
- void [setXDot](#) (double xdot)
set the x-Velocity.
- void [setYDot](#) (double ydot)
set the y-Velocity.
- void [setZDot](#) (double zdot)
set the z-Velocity.
- int [getSatNumber](#) ()
Returns the Satellite Number.
- [Point3d](#) [getPositionData](#) ()
Returns the Position Data as a 3d-Point.
- [Point3d](#) [getVelocityData](#) ()
Returns the velocity Data as a 3d-Point.
- double [getX](#) ()
Returns the X Position.
- double [getY](#) ()
Returns the Y Position.
- double [getZ](#) ()
Returns the Z Position.
- double [getXDot](#) ()
Returns the X Velocity.
- double [getYDot](#) ()
Returns the Y Velocity.
- double [getZDot](#) ()
Returns the Z Velocity.
- string [getPosDataString](#) ()
Returns position as String.
- string [getVelDataString](#) ()
Returns velocity as String.
- void [clear](#) ()
Clears all Data.

5.10.1 Constructor & Destructor Documentation

5.10.1.1 One_Sgp4.Sgp4Data.Sgp4Data (int satNr = -1) [inline]

SGP4-Data constructor.

Parameters

| | |
|----------------|-----------------|
| <i>integer</i> | SateliteNumber. |
|----------------|-----------------|

5.10.2 Member Function Documentation

5.10.2.1 string One_Sgp4.Sgp4Data.getPosDataString () [inline]

Returns position as String.

double X Y Z

5.10.2.2 Point3d One_Sgp4.Sgp4Data.getPositionData () [inline]

Returns the Position Data as a 3d-Point.

Returns

double x, y, z;

5.10.2.3 int One_Sgp4.Sgp4Data.getSatNumber () [inline]

Returns the Satellite Number.

Returns

double SateliteNr

5.10.2.4 string One_Sgp4.Sgp4Data.getVelDataString () [inline]

Returns velocity as String.

double XDot YDot ZDot

5.10.2.5 Point3d One_Sgp4.Sgp4Data.getVelocityData () [inline]

Returns the velocity Data as a 3d-Point.

Returns

double x, y, z;

5.10.2.6 double One_Sgp4.Sgp4Data.getX () [inline]

Returns the X Position.

Returns

double x

5.10.2.7 `double One_Sgp4.Sgp4Data.getXDot () [inline]`

Returns the X Velocity.

Returns

double xDot

5.10.2.8 `double One_Sgp4.Sgp4Data.getY () [inline]`

Returns the Y Position.

Returns

double y

5.10.2.9 `double One_Sgp4.Sgp4Data.getYDot () [inline]`

Returns the Y Velocity.

Returns

double yDot

5.10.2.10 `double One_Sgp4.Sgp4Data.getZ () [inline]`

Returns the Z Position.

Returns

double z

5.10.2.11 `double One_Sgp4.Sgp4Data.getZDot () [inline]`

Returns the Z Velocity.

Returns

double zDot

5.10.2.12 `void One_Sgp4.Sgp4Data.setSatNumber (int Nr) [inline]`

set the Satellite Number.

Parameters

| | |
|------------|-----|
| <i>int</i> | Nr. |
|------------|-----|

5.10.2.13 `void One_Sgp4.Sgp4Data.setX (double x) [inline]`

set the X-Coordinate for Position.

Parameters

| | |
|---------------|---|
| <i>double</i> | X |
|---------------|---|

5.10.2.14 void One_Sgp4.Sgp4Data.setXDot (double *xdot*) [inline]

set the x-Velocity.

Parameters

| | |
|---------------|-------------|
| <i>double</i> | <i>xdot</i> |
|---------------|-------------|

5.10.2.15 void One_Sgp4.Sgp4Data.setY (double *y*) [inline]

set the Y-Coordinate for Position.

Parameters

| | |
|---------------|----------|
| <i>double</i> | <i>Y</i> |
|---------------|----------|

5.10.2.16 void One_Sgp4.Sgp4Data.setYDot (double *ydot*) [inline]

set the y-Velocity.

Parameters

| | |
|---------------|-------------|
| <i>double</i> | <i>ydot</i> |
|---------------|-------------|

5.10.2.17 void One_Sgp4.Sgp4Data.setZ (double *z*) [inline]

set the Z-Coordinate for Position.

Parameters

| | |
|---------------|----------|
| <i>double</i> | <i>Z</i> |
|---------------|----------|

5.10.2.18 void One_Sgp4.Sgp4Data.setZDot (double *zdot*) [inline]

set the z-Velocity.

Parameters

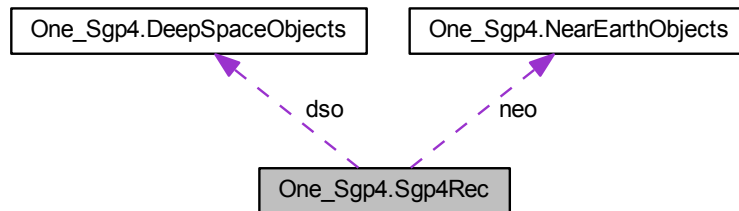
| | |
|---------------|-------------|
| <i>double</i> | <i>zdot</i> |
|---------------|-------------|

The documentation for this class was generated from the following file:

- One_Sgp4/Sgp4Data.cs

5.11 One_Sgp4.Sgp4Rec Class Reference

Collaboration diagram for One_Sgp4.Sgp4Rec:



Public Attributes

- int **rec_satnum**
- int **rec_epochyr**
- int **rec_init**
- int **rec_epochtynumrev**
- int **rec_error**
- double **rec_a**
- double **rec_altp**
- double **rec_alta**
- double **rec_epochdays**
- double **rec_mjdsatepoch**
- double **rec_nddot**
- double **rec_ndot**
- double **rec_bstar**
- double **rec_rcse**
- double **rec_inclo**
- double **rec_omegao**
- double **rec_ecco**
- double **rec_argpo**
- double **rec_mo**
- double **rec_no**
- double **rec_eptime**
- double **rec_srtime**
- double **rec_sptime**
- double **rec_deltamin**
- double **rec_ep**
- double **rec_xincp**
- double **rec_omegap**
- double **rec_argpp**
- double **rec_mp**
- double[] **rec_r**
- double[] **rec_v**
- [NearEarthObjects](#) **neo**
- [DeepSpaceObjects](#) **dso**

The documentation for this class was generated from the following file:

- One_Sgp4/Sgp4Rec.cs

5.12 One_Sgp4.Tle Class Reference

Public Member Functions

- [Tle](#) ()
enum class that represents the satellite classification
- [Tle](#) (string name)
Tle constructor.
- [Tle](#) (string name, string id, [Enum.satClass](#) clas, int startY, int startNr, string piece, int epochY, double epochD, double firstMM, double secondMM, double drag, double ephem, int setNr, int check1, int satNr, double incl, double rightAsc, double ecce, double peri, double meanAn, double meanMo, double relevationNr, int check2)
TLE constructor.
- [Tle](#) (string name, string id, int clas, int startY, int startNr, string piece, int epochY, double epochD, double firstMM, double secondMM, double drag, double ephem, int setNr, int check1, int satNr, double incl, double rightAsc, double ecce, double peri, double meanAn, double meanMo, double relevationNr, int check2)
TLE constructor.
- bool [isValidData](#) ()
Returns true if Data matches Checksum.
- string [getName](#) ()
Returns the Object Name.
- string [getNoradID](#) ()
Returns the NORAD Identification.
- int [getStartYear](#) ()
Returns the start Year of satellite.
- int [getStartNr](#) ()
Returns the start number of satellite.
- string [getPice](#) ()
Returns the Piece designator.
- int [getEpochYear](#) ()
Returns the Year of the Epoch.
- double [getEpochDay](#) ()
Returns the Day of the Epoch.
- double [getFirstMeanMotion](#) ()
Returns the First Mean Motion.
- double [getSecondMeanMotion](#) ()
Returns the Second Mean Motion.
- double [getDrag](#) ()
Returns the Drag value.
- double [getEphemeris](#) ()
Returns the Ephemeris.
- double [getSetNumber](#) ()
Returns the Set Number.
- int [getSatNumber](#) ()
Returns the Satellite Number.
- double [getInclination](#) ()
Returns the Inclination.
- double [getRightAscendingNode](#) ()
Returns the Richt Ascending Node.
- double [getEccentriciy](#) ()
Returns the Eccentricity.
- double [getPerigee](#) ()

- Returns the Perigee.*
- double [getMeanAnomaly](#) ()
Returns the Mean Anomaly.
- double [getMeanMotion](#) ()
Returns the Mean Motion.
- double [getRelevationNumber](#) ()
Returns the number of Relevations.
- int [getClassification](#) ()
Returns Classification.
- int [getFirstChecksum](#) ()
Returns the Checksum for the first TLE line.
- int [getSecChecksum](#) ()
Returns the Checksum for the second TLE line.

5.12.1 Constructor & Destructor Documentation

5.12.1.1 `One_Sgp4.Tle.Tle () [inline]`

enum class that represents the satellite classification

enum SatClassTle constructor.

empty constructor

5.12.1.2 `One_Sgp4.Tle.Tle (string name) [inline]`

[Tle](#) constructor.

/param string Name of Satellite

5.12.1.3 `One_Sgp4.Tle.Tle (string name, string id, Enum.satClass clas, int startY, int startNr, string piece, int epochY, double epochD, double firstMM, double secondMM, double drag, double ephem, int setNr, int check1, int satNr, double incl, double rightAsc, double ecce, double peri, double meanAn, double meanMo, double relevationNr, int check2) [inline]`

TLE constructor.

Parameters

| | |
|-----------------|------------------------------|
| <i>string</i> | name of Satellite. |
| <i>string</i> | ID of Satellite. |
| <i>satClass</i> | classification of Satellite. |
| <i>int</i> | startYear of Satellite |
| <i>string</i> | PieceName |
| <i>int</i> | EpochYear |
| <i>double</i> | EpochDay |
| <i>double</i> | firstMeanMotion |
| <i>double</i> | secondMeanMotion |
| <i>double</i> | Drag Term |
| <i>double</i> | Ephemeris |

| | |
|---------------|--|
| <i>double</i> | Set number of TLE Data |
| <i>int</i> | Checksum (Modulo 10) |
| <i>int</i> | Satellite number |
| <i>double</i> | Inclination |
| <i>double</i> | right Ascending Node |
| <i>double</i> | Eccentricity |
| <i>double</i> | Perigee |
| <i>double</i> | MeanAnomaly |
| <i>double</i> | MeanMotion |
| <i>double</i> | revelation number |
| <i>int</i> | Checksum (Modulo 10) Each Object of TLE must have a valid Name |

5.12.1.4 `One_Sgp4.Tle.Tle (string name, string id, int clas, int startY, int startNr, string piece, int epochY, double epochD, double firstMM, double secondMM, double drag, double ephem, int setNr, int check1, int satNr, double incl, double rightAsc, double ecce, double peri, double meanAn, double meanMo, double relevalationNr, int check2)`
`[inline]`

TLE constructor.

Parameters

| | |
|-----------------|--|
| <i>string</i> | name of Satellite. |
| <i>string</i> | ID of Satellite. |
| <i>satClass</i> | classification of Satellite. |
| <i>int</i> | startYear of Satellite |
| <i>string</i> | PieceName |
| <i>int</i> | EpochYear |
| <i>double</i> | EpochDay |
| <i>double</i> | firstMeanMotion |
| <i>double</i> | secondMeanMotion |
| <i>double</i> | Drag Term |
| <i>double</i> | Ephemeris |
| <i>double</i> | Set number of TLE Data |
| <i>int</i> | Checksum (Modulo 10) |
| <i>int</i> | Satellite number |
| <i>double</i> | Inclination |
| <i>double</i> | right Ascending Node |
| <i>double</i> | Eccentricity |
| <i>double</i> | Perigee |
| <i>double</i> | MeanAnomaly |
| <i>double</i> | MeanMotion |
| <i>double</i> | revelation number |
| <i>int</i> | Checksum (Modulo 10) Each Object of TLE must have a valid Name |

5.12.2 Member Function Documentation

5.12.2.1 `int One_Sgp4.Tle.getClassification ()` `[inline]`

Returns Classification.

Returns

ing satellite Classifictaion

5.12.2.2 `double One_Sgp4.Tle.getDrag () [inline]`

Returns the Drag value.

Returns

double dragTerm

5.12.2.3 `double One_Sgp4.Tle.getEccentriciy () [inline]`

Returns the Eccentricity.

Returns

double eccentricity

5.12.2.4 `double One_Sgp4.Tle.getEphemeris () [inline]`

Returns the Ephemeris.

Returns

double ephemeris

5.12.2.5 `double One_Sgp4.Tle.getEpochDay () [inline]`

Returns the Day of the Epoch.

Returns

double EpochDay

5.12.2.6 `int One_Sgp4.Tle.getEpochYear () [inline]`

Returns the Year of the Epoch.

Returns

int EpochYear

5.12.2.7 `int One_Sgp4.Tle.getFirstChecksum () [inline]`

Returns the Checksum for the first TLE line.

Returns

int checksum1

5.12.2.8 `double One_Sgp4.Tle.getFirstMeanMotion () [inline]`

Returns the First Mean Motion.

Returns

double meanMotion

5.12.2.9 double One_Sgp4.Tle.getInclination () [inline]

Returns the Inclination.

Returns

double inclination

5.12.2.10 double One_Sgp4.Tle.getMeanAnomaly () [inline]

Returns the Mean Anomaly.

Returns

double meanAnomaly

5.12.2.11 double One_Sgp4.Tle.getMeanMotion () [inline]

Returns the Mean Motion.

Returns

double meanMotion

5.12.2.12 string One_Sgp4.Tle.getName () [inline]

Returns the Object Name.

Returns

string Name

5.12.2.13 string One_Sgp4.Tle.getNoradID () [inline]

Returns the NORAD Identification.

Returns

string NoradID

5.12.2.14 double One_Sgp4.Tle.getPerigee () [inline]

Returns the Perigee.

Returns

double perigee

5.12.2.15 string One_Sgp4.Tle.getPice () [inline]

Returns the Piece designator.

Returns

string Piece

5.12.2.16 `double One_Sgp4.Tle.getRelevationNumber () [inline]`

Returns the number of Relevations.

Returns

double relevationNumber

5.12.2.17 `double One_Sgp4.Tle.getRightAscendingNode () [inline]`

Returns the Richt Ascending Node.

Returns

double right Ascension

5.12.2.18 `int One_Sgp4.Tle.getSatNumber () [inline]`

Returns the Satellite Number.

Returns

int satNumber

5.12.2.19 `int One_Sgp4.Tle.getSecChecksum () [inline]`

Returns the Checksum for the second TLE line.

Returns

int checksum2

5.12.2.20 `double One_Sgp4.Tle.getSecondMeanMotion () [inline]`

Returns the Second Mean Motion.

Returns

double secondMeanMotion

5.12.2.21 `double One_Sgp4.Tle.getSetNumber () [inline]`

Returns the Set Number.

Returns

double setNumber

5.12.2.22 `int One_Sgp4.Tle.getStartNr () [inline]`

Returns the start number of satellite.

Returns

int StartNumber

5.12.2.23 `int One_Sgp4.Tle.getStartYear () [inline]`

Returns the start Year of satellite.

Returns

`int StartYear`

5.12.2.24 `bool One_Sgp4.Tle.isValidData () [inline]`

Returns true if Data matches Checksum.

Returns

`boolean true/false`

The documentation for this class was generated from the following file:

- `One_Sgp4/Tle.cs`

5.13 One_Sgp4.WebTleLoader Class Reference

Classes

- class [WebClientEx](#)

Static Public Member Functions

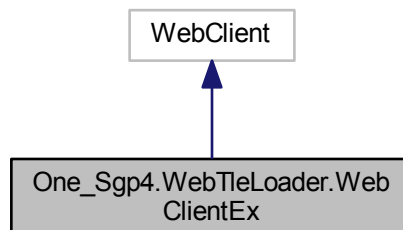
- static string **GetSpaceTrack** (string[] noradId, string username, string password)

The documentation for this class was generated from the following file:

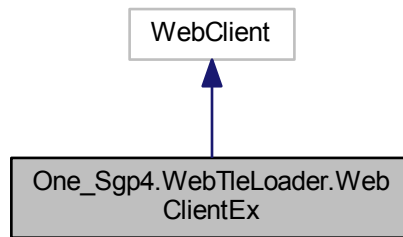
- `One_Sgp4/SpaceTrack.cs`

5.14 One_Sgp4.WebTleLoader.WebClientEx Class Reference

Inheritance diagram for `One_Sgp4.WebTleLoader.WebClientEx`:



Collaboration diagram for One_Sgp4.WebTleLoader.WebClientEx:



Protected Member Functions

- override WebRequest **GetWebRequest** (Uri address)

The documentation for this class was generated from the following file:

- One_Sgp4/SpaceTrack.cs

5.15 One_Sgp4.WGS_72 Class Reference

Public Attributes

- const double [radiusEarthKM](#) = 6378.135
[WGS_72](#) Class definition.
- const double **mu** = 398600.8
- const double **j2** = 0.001082616
- const double **j3** = -0.00000253881
- const double **j4** = -0.00000165597

5.15.1 Member Data Documentation

5.15.1.1 const double One_Sgp4.WGS_72.radiusEarthKM = 6378.135

[WGS_72](#) Class definition.

This class defines the World Geodetic System of 1972 used for the orbit predictions. For Furhter references this is included but for a higher accuracy WGS_82 should be used.double Radius of the Earch in km

The documentation for this class was generated from the following file:

- One_Sgp4/WGS72.cs

5.16 One_Sgp4.WGS_84 Class Reference

Public Attributes

- const double [radiusEarthKM](#) = 6378.137
[WGS_84](#) Class definition.
- const double **mu** = 398600.5
- const double **j2** = 0.00108262998905
- const double **j3** = -0.00000253215306
- const double **j4** = -0.00000161098761

5.16.1 Member Data Documentation

5.16.1.1 const double One_Sgp4.WGS_84.radiusEarthKM = 6378.137

[WGS_84](#) Class definition.

This class defines the World Geodetic System of 1984 used for the orbit predictions.double Radius of the Earch in km

The documentation for this class was generated from the following file:

- One_Sgp4/Wgs84.cs

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