

# **Links Point GPS Toolkit for the .NET Framework**

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# Links Point GPS Toolkit for the .NET Framework

## 1 LinksPoint

This is namespace LinksPoint.

### Namespaces

Namespace	Description
GPS ( <a href="#">see page 1</a> )	Namespace for the Links Point GPS Toolkit

## 1.1 LinksPoint.GPS

Namespace for the Links Point GPS Toolkit

### Classes

Class	Description
GPSLib ( <a href="#">see page 1</a> )	GPS Toolkit Class

### 1.1.1 GPSLib

#### Class Hierarchy

GPSLib

```
public class GPSLib;
```

#### File






GPS.cs ([see page 13](#))













#### Description

GPS Toolkit Class




#### Members

#### Properties

Property	Description
 Altitude ( <a href="#">see page 2</a> )	Returns the current height above mean GEOID referenced to the WGS84 ellipsoid. Read only
 AutoDetectEnabled ( <a href="#">see page 2</a> )	Returns/Sets the auto detect mode for configuring communications settings. Read/write
 BaudRate ( <a href="#">see page 3</a> )	Returns/Sets the baud rate for the connected device Read/write
 Enable ( <a href="#">see page 3</a> )	Enables or disables the communication to the GPS
 FixType ( <a href="#">see page 3</a> )	Returns the current GPS fix type Read only

 HDOP ( <a href="#">see page 3</a> )	Returns the current Horizontal Dilution of Precision Read only
 Latitude ( <a href="#">see page 3</a> )	Returns the current Latitude Read only
 Longitude ( <a href="#">see page 3</a> )	Returns the current Longitude Read only
 Port ( <a href="#">see page 4</a> )	Gets or sets the current communications port Read/write
 PositionFormat ( <a href="#">see page 4</a> )	Data format for Latitude ( <a href="#">see page 3</a> ) and Longitude ( <a href="#">see page 3</a> ) Read/write
 Protocol ( <a href="#">see page 4</a> )	Returns/Sets the communications protocol for the GPS Read/write
 Quality ( <a href="#">see page 4</a> )	Gets the current GPS fix quality Read only
 Receiver ( <a href="#">see page 4</a> )	Returns/Sets the GPS receiver type Read/write
 SatellitesUsed ( <a href="#">see page 4</a> )	Returns the number of satellites used in the fix solution Read only
 SatellitesVisible ( <a href="#">see page 4</a> )	Returns the number of satellites visible in the sky Read only
 Speed ( <a href="#">see page 5</a> )	Returns the current Speed Read only
 TrueCourse ( <a href="#">see page 5</a> )	Returns the True Course over Ground in degrees Read only
 UTCTime ( <a href="#">see page 5</a> )	Gets the current GPS UTC time Read only
 UTMEasting ( <a href="#">see page 5</a> )	Returns the UTM Easting in meters referenced to the current UTM zone Read only
 UTMNorthing ( <a href="#">see page 5</a> )	Returns the UTM Northing in meters referenced to the current UTM zone Read only
 UTMZone ( <a href="#">see page 5</a> )	Returns the current UTM zone number Read only

## Methods

Method	Description
 GPSTLib ( <a href="#">see page 5</a> )	Constructor
 InitializeReceiver ( <a href="#">see page 6</a> )	Initialized a GPS receiver with a Cold Start, Hot Start, Warm Start or Factory Reset
 SatelliteDetail ( <a href="#">see page 6</a> )	Returns details about a specific satellite channel.

## Legend

	Property
	Method

### 1.1.1.1 GPSTLib.Altitude

Returns the current height above mean GEOID referenced to the WGS84 ellipsoid.

Read only

```
public double Altitude;
```

### 1.1.1.2 GPSTLib.AutoDetectEnabled

Returns/Sets the auto detect mode for configuring communications settings.

Read/write

```
public bool AutoDetectEnabled;
```

### 1.1.1.3 GPSTLib.BaudRate

Returns/Sets the baud rate for the connected device

Read/write

```
public int BaudRate;
```

### 1.1.1.4 GPSTLib.Enable

Enables or disables the communication to the GPS

```
public bool Enable;
```

### 1.1.1.5 GPSTLib.FixType

Returns the current GPS fix type

Read only

```
public GPSFIXTYPE FixType;
```

### 1.1.1.6 GPSTLib.HDOP

Returns the current Horizontal Dilution of Precision

Read only

```
public double HDOP;
```

### 1.1.1.7 GPSTLib.Latitude

Returns the current Latitude

Read only

```
public string Latitude;
```

#### Remarks

The value returned is a string formatted according to the PositionFormat (☞ see page 4) setting

#### See Also

PositionFormat (☞ see page 4)

### 1.1.1.8 GPSTLib.Longitude

Returns the current Longitude

Read only

```
public string Longitude;
```

#### Remarks

The value returned is a string formatted according to the PositionFormat (☞ see page 4) setting

#### See Also

PositionFormat (☞ see page 4)

---

### 1.1.1.9 GPSTLib.Port

Gets or sets the current communications port

Read/write

```
public string Port;
```

#### Remarks

The format of the string is "COMn:" where n is the port number.

### 1.1.1.10 GPSTLib.PositionFormat

Data format for Latitude (☞ see page 3) and Longitude (☞ see page 3)

Read/write

```
public GPSTPOSFORMAT PositionFormat;
```

### 1.1.1.11 GPSTLib.Protocol

Returns/Sets the communications protocol for the GPS

Read/write

```
public GPSTPROTOCOL Protocol;
```

### 1.1.1.12 GPSTLib.Quality

Gets the current GPS fix quality

Read only

```
public GPSTQUALITY Quality;
```

### 1.1.1.13 GPSTLib.Receiver

Returns/Sets the GPS receiver type

Read/write

```
public GPSTRECEIVER Receiver;
```

### 1.1.1.14 GPSTLib.SatellitesUsed

Returns the number of satellites used in the fix solution

Read only

```
public short SatellitesUsed;
```

### 1.1.1.15 GPSTLib.SatellitesVisible

Returns the number of satellites visible in the sky

Read only

```
public short SatellitesVisible;
```

### 1.1.1.16 GPSTLib.Speed

Returns the current Speed

Read only

```
public double Speed;
```

### 1.1.1.17 GPSTLib.TrueCourse

Returns the True Course over Ground in degrees

Read only

```
public double TrueCourse;
```

### 1.1.1.18 GPSTLib.UTCTime

Gets the current GPS UTC time

Read only

```
public string UTCTime;
```

### 1.1.1.19 GPSTLib.UTMEasting

Returns the UTM Easting in meters referenced to the current UTM zone

Read only

```
public int UTMEasting;
```

### 1.1.1.20 GPSTLib.UTMNorthing

Returns the UTM Northing in meters referenced to the current UTM zone

Read only

```
public int UTMNorthing;
```

### 1.1.1.21 GPSTLib.UTMZone

Returns the current UTM zone number

Read only

```
public short UTMZone;
```

### 1.1.1.22 GPSTLib.GPSTLib

```
public GPSTLib();
```

#### Description

Constructor

### 1.1.1.23 GPSTLib.InitializeReceiver

Initialized a GPS receiver with a Cold Start, Hot Start, Warm Start or Factory Reset

```
public GPSError InitializeReceiver(GPSINITMODE gimMode);
```

### 1.1.1.24 GPSTLib.SatelliteDetail

Returns details about a specific satellite channel.

```
public GPSError SatelliteDetail(ushort usChannel, out GPSSATELLITE gsSatellite);
```

## 1.1.2 Types

Enumerations and structures used in the GPS Toolkit

### Enumerations

Enumeration	Description
GPSRECEIVER (see page 6)	Gps receiver types
GPSQUALITY (see page 7)	GPS quality types
GPSPROTOCOL (see page 9)	Receiver protocol types
GPSPOSFORMAT (see page 9)	Format for latitude and longitude values
GPSINITMODE (see page 10)	Receiver initialization types
GPSFIXTYPE (see page 10)	GPS fix types
GPSError (see page 11)	GPS Toolkit error codes
GPSBOOL (see page 12)	Boolean type
GPSEENABLE (see page 12)	Type indicating whether or not the GPS toolkit is enabled
GPSFORMAT (see page 12)	Read/write

### Structs

Struct	Description
GPSSATELLITE (see page 7)	Class representing a single satellite

### 1.1.2.1 LinksPoint.GPS.GPSRECEIVER

```
public enum GPSRECEIVER {
    public GPSRECEIVER_SIRF = 0,
    public GPSRECEIVER_ROCKWELL,
    public GPSRECEIVER_GARMIN,
    public GPSRECEIVER_MAGELLAN,
    public GPSRECEIVER_JRC,
    public GPSRECEIVER_NAVICOM,
    public GPSRECEIVER_SONY,
    public GPSRECEIVER_EMTAC,
    public GPSRECEIVER_TRINE,
    public GPSRECEIVER_UNKNOWN
}
```

### File

GPS.cs (see page 13)

### Members

Members	Description
public GPSRECEIVER_SIRF = 0	SiRF receiver
public GPSRECEIVER_ROCKWELL	Rockwell receiver
public GPSRECEIVER_GARMIN	Garmin receiver

public GPSRECEIVER_MAGELLAN	Magellan receiver
public GPSRECEIVER_JRC	Japan Radion Corporation receiver
public GPSRECEIVER_NAVICOM	Navicom receiver
public GPSRECEIVER_SONY	Sony receiver
public GPSRECEIVER_EMETAC	Emtac receiver
public GPSRECEIVER_TRINE	Trine receiver
public GPSRECEIVER_UNKNOWN	Unknown receiver

**Description**

Gps receiver types

**1.1.2.2 LinksPoint.GPS.GPSQUALITY**

```
public enum GPSQUALITY {
    public GPSQUALITY_INVALID = 0,
    public GPSQUALITY_UNCORRECTED,
    public GPSQUALITY_CORRECTED,
    public GPSQUALITY_PPS,
    public GPSQUALITY_INT_RTK,
    public GPSQUALITY_FLOAT_RTK,
    public GPSQUALITY_ESTIMATED,
    public GPSQUALITY_MANUAL_INPUT,
    public GPSQUALITY_SIMULATOR,
    public GPSQUALITY_STALE,
    public GPSQUALITY_AUTONOMOUS,
    public GPSQUALITY_DIFFERENTIAL,
    public GPSQUALITY_VALID
}
```

**File**

GPS.cs (see page 13)

**Members**

Members	Description
public GPSQUALITY_INVALID = 0	Invalid fix
public GPSQUALITY_UNCORRECTED	Uncorrected fix
public GPSQUALITY_CORRECTED	Corrected fix
public GPSQUALITY_PPS	Precise Position Service fix
public GPSQUALITY_INT_RTK	Integer Real Time Kinematic fix
public GPSQUALITY_FLOAT_RTK	Floating point Real Time Kinematic fix
public GPSQUALITY_ESTIMATED	Estimated fix
public GPSQUALITY_MANUAL_INPUT	Manually input fix
public GPSQUALITY_SIMULATOR	Simulated fix
public GPSQUALITY_STALE	Stale fix
public GPSQUALITY_AUTONOMOUS	Receiver operating in autonomous mode
public GPSQUALITY_DIFFERENTIAL	Differentially corrected fix
public GPSQUALITY_VALID	Valid fix

**Description**

GPS quality types

**1.1.2.3 GPSSATELLITE****Class Hierarchy**

GPSSATELLITE

```
public struct GPSSATELLITE {
}
```

**File**

GPS.cs (🔗 see page 13)

**Description**

Class representing a single satellite

**Members****Methods**

Method	Description
🔗 Azimuth (🔗 see page 8)	Returns the value of the satellite azimuth in radians
🔗 Elevation (🔗 see page 8)	Returns the value of the satellite elevation in radians
🔗 EphemerisAvailable (🔗 see page 8)	Returns TRUE if the ephemeris information for this satellite has been collected by the receiver
🔗 ID (🔗 see page 8)	Returns the SVID (Space Vehicle ID) of the satellite
🔗 SNR (🔗 see page 8)	Returns the Signal To Noise Ratio of the satellite
🔗 Used (🔗 see page 9)	Returns TRUE if this satellite has been used in the navigation solution
🔗 Valid (🔗 see page 9)	Returns TRUE if the information for this Satellite is valid
🔗 Visible (🔗 see page 9)	Returns TRUE if this satellite is visible in the hemisphere

**Legend**

🔗	Method
---	--------

**1.1.2.3.1 GPSSATELLITE.Azimuth**

```
public double Azimuth();
```

**Description**

Returns the value of the satellite azimuth in radians

**1.1.2.3.2 GPSSATELLITE.Elevation**

```
public double Elevation();
```

**Description**

Returns the value of the satellite elevation in radians

**1.1.2.3.3 GPSSATELLITE.EphemerisAvailable**

```
public bool EphemerisAvailable();
```

**Description**

Returns TRUE if the ephemeris information for this satellite has been collected by the receiver

**1.1.2.3.4 GPSSATELLITE.ID**

```
public short ID();
```

**Description**

Returns the SVID (Space Vehicle ID) of the satellite

**1.1.2.3.5 GPSSATELLITE.SNR**

```
public short SNR();
```

**Description**

Returns the Signal To Noise Ratio of the satellite

### 1.1.2.3.6 GPSSATELLITE.Used

```
public bool Used();
```

#### Description

Returns TRUE if this satellite has been used in the navigation solution

### 1.1.2.3.7 GPSSATELLITE.Valid

```
public bool Valid();
```

#### Description

Returns TRUE if the information for this Satellite is valid

### 1.1.2.3.8 GPSSATELLITE.Visible

```
public bool Visible();
```

#### Description

Returns TRUE if this satellite is visible in the hemisphere

## 1.1.2.4 LinksPoint.GPS.GPSPROTOCOL

```
public enum GPSPROTOCOL {
    public GPSPROTOCOL_NMEA = 0,
    public GPSPROTOCOL_ROCKWELL,
    public GPSPROTOCOL_SIRF,
    public GPSPROTOCOL_JRC,
    public GPSPROTOCOL_NAVICOM,
    public GPSPROTOCOL_SONY,
    public GPSPROTOCOL_GARMIN,
    public GPSPROTOCOL_UNKNOWN
}
```

#### File

GPS.cs (see page 13)

#### Members

Members	Description
public GPSPROTOCOL_NMEA = 0	National Marine Electorinics Association protocol
public GPSPROTOCOL_ROCKWELL	Rockwell protocol
public GPSPROTOCOL_SIRF	SiRF Technologies protocol
public GPSPROTOCOL_JRC	Japan Radio Corporation protocol
public GPSPROTOCOL_NAVICOM	Navicom protocol
public GPSPROTOCOL_SONY	Sony protocol
public GPSPROTOCOL_GARMIN	Garmin protocol
public GPSPROTOCOL_UNKNOWN	Unknown protocol

#### Description

Receiver protocol types

## 1.1.2.5 LinksPoint.GPS.GPSPOSFORMAT

Format for latitude and longitude values

```
public enum GPSPOSFORMAT {
    public GPSPOSFORMAT_DEGREES = 0,
```

```

    public GPSPOSFORMAT_DM,
    public GPSPOSFORMAT_DMS
}

```

**File**

GPS.cs (see page 13)

**Members**

Members	Description
public GPSPOSFORMAT_DEGREES = 0	Decimal degrees
public GPSPOSFORMAT_DM	Degrees, decimal minutes
public GPSPOSFORMAT_DMS	Degrees, minutes, decimal seconds

**Remarks****GPSPOSFORMAT\_DEGREES**

{+, -}ddd.dddddd

- Latitude values are negative for south and positive for north. Example: 41.107050
- Longitude values are negative for west and positive for east. Example: -73.409050

**GPSFORMAT\_DM**

ddd° mm.mm'{N, S, E, W}

- Latitude values are appended with 'N' for north or 'S' for south. Example: 41°6.423'N
- Longitude values are appended with 'E' for east or 'W' for west. Example: 73°24.543'W

**GPSFORMAT\_DMS**

ddd°mm'ss.s"{N, S, E, W}

- Latitude values are appended with 'N' for north or 'S' for south. Example: 41°6'25.4"N
- Longitude values are appended with 'E' for east or 'W' for west. Example: 73°24'32.5"W

## 1.1.2.6 LinksPoint.GPS.GPSINITMODE

```

public enum GPSINITMODE {
    public GPSINIT_HOT_START = 0,
    public GPSINIT_WARM_START = 2,
    public GPSINIT_COLD_START,
    public GPSINIT_FACTORY_START
}

```

**File**

GPS.cs (see page 13)

**Members**

Members	Description
public GPSINIT_HOT_START = 0	Restarts the receiver without clearing any position or time information
public GPSINIT_WARM_START = 2	Clears position and time information and restarts the receiver
public GPSINIT_COLD_START	Clears all position time and ephemeris information and restarts the receiver
public GPSINIT_FACTORY_START	Clears all position, time, ephemeris and configuration information and restarts the receiver

**Description**

Receiver initialization types

## 1.1.2.7 LinksPoint.GPS.GPSFIXTYPE

```

public enum GPSFIXTYPE {

```

```

public GPSFIX_UNAVAILABLE,
public GPSFIX_1_SATELLITE_SOLUTION,
public GPSFIX_2_SATELLITE_SOLUTION,
public GPSFIX_3_SATELLITE_SOLUTION,
public GPSFIX_3_PLUS_SATELLITE_SOLUTION,
public GPSFIX_2D,
public GPSFIX_3D,
public GPSFIX_DEAD_RECKONING
}

```

**File**

GPS.cs (see page 13)

**Members**

Members	Description
public GPSFIX_UNAVAILABLE	GPS fix invalid
public GPSFIX_1_SATELLITE_SOLUTION	One satellite estimated solution
public GPSFIX_2_SATELLITE_SOLUTION	Two satellite estimated solution
public GPSFIX_3_SATELLITE_SOLUTION	Three satellite Kalman Filter solution
public GPSFIX_3_PLUS_SATELLITE_SOLUTION	Greater than three satellite Kalman Filter solution
public GPSFIX_2D	Two dimensional least squared solution
public GPSFIX_3D	Three dimensional least squared solution
public GPSFIX_DEAD_RECKONING	Estimated solution from dead reckoning inputs

**Description**

GPS fix types

## 1.1.2.8 LinksPoint.GPS.GPSError

GPS Toolkit error codes

```

public enum GPSError {
public GPSError_NONE = 0,
public GPSError_MATHLIB = -1,
public GPSError_ALREADY_INITIALIZED = -2,
public GPSError_INVALID_PROTOCOL = -3,
public GPSError_NO_DATA = -4,
public GPSError_INVALID_PARAMETER = -5,
public GPSError_BUFFER_TOO_SMALL = -6,
public GPSError_CONFIG = -7,
public GPSError_POLL = -8,
public GPSError_MEMORY = -9
}

```

**File**

GPS.cs (see page 13)

**Members**

Members	Description
public GPSError_NONE = 0	No error
public GPSError_MATHLIB = -1	A math library error occurred
public GPSError_ALREADY_INITIALIZED = -2	The toolkit has already been initialized
public GPSError_INVALID_PROTOCOL = -3	An invalid protocol was specified
public GPSError_NO_DATA = -4	No data
public GPSError_INVALID_PARAMETER = -5	An invalid parameter was passed
public GPSError_BUFFER_TOO_SMALL = -6	A buffer was too small
public GPSError_CONFIG = -7	Configuration error
public GPSError_POLL = -8	Poll
public GPSError_MEMORY = -9	Not enough memory to complete the operation

### 1.1.2.9 LinksPoint.GPS.GPSLib.GPSBOOL

```
private enum GPSBOOL {  
    public GPSBOOL_FALSE = 0,  
    public GPSBOOL_TRUE  
}
```

**File****Description**

Boolean type

### 1.1.2.10 LinksPoint.GPS.GPSLib.GPSENABLE

```
private enum GPSENABLE {  
    public GPSENABLE_FALSE = 0,  
    public GPSENABLE_TRUE  
}
```

**File****Description**

Type indicating whether or not the GPS toolkit is enabled

### 1.1.2.11 LinksPoint.GPS.GPSLib.GPSFORMAT

Read/write

```
private enum GPSFORMAT : int {  
    public GPSFORMAT_DEGREES = 0,  
    public GPSFORMAT_RADIANS  
}
```

**File****See Also**

Latitude (↗ see page 3), Longitude (↗ see page 3), GPSPPOSFORMAT (↗ see page 9)

# 2 Files

---

## 2.1 GPS.cs

Namespaces and class definitions for the Links Point GPS Toolkit .NET

### Namespaces

Namespace	Description
LinksPoint ( <a href="#">↗</a> see page 1)	This is namespace LinksPoint.

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