RTCM 3.x Message Types

Supported RTCM 3.x Message Types

The following RTCM 3.x message types are supported by RTCMR_IN, if not noted otherwise.

RTCM Version 3.0

GPS RTK Observations

Type	Content
1001	GPS L1 observations
1002	GPS L1 observations, extended information [1])
1003	GPS L1+L2 observations
1004	GPS L1+L2 observations, extended information [1])

[1]) Extended information contains Signal-to-Noise (CNO) and full milliseconds for code observations.

Stationary Antenna Reference Point

Type	Content
1005	ARP station coordinates, ECEF XYZ
1006	ARP station coordinates, ECEF XYZ and extended information [2])

[2]) Extended information contains the antenna height.

Antenna Description

Type	Content
1007	antenna type
1008	antenna type, extended information [3])

[3]) Extended information contains the antenna serial number.

See also message type 1033, which contains in addition to the antenna data from 1008 a receiver descriptor.

GLONASS Observations

Type	Content
1009	GLONASS L1 observations
1010	GLONASS L1 observations, extended information [4])
1011	GLONASS L1+L2 observations
1012	GLONASS L1+L2 observations, extended information [4])

[4]) Extended information contains Signal-to-Noise (CNO) and full milliseconds for code observations.

System Parameters

Type	Content
1013	system parameters, list of transmitted message types and update rates

RTCM Version 3.1

RTCM 3.1 has been confirmed by RTCM in 2006. It introduced 5 new message types for network operation, 2 new message types for GPS and GLONASS ephemeris data, and 1 new message type for arbitrary text messages,

Network Message

The types 1014 through 1018 are supposed for Network Messages according to the so called “Master Auxiliary Concept” (MAC). The following message types are defined:

Type	Content
1014	Network Auxiliary Station Data coordinate difference between one Aux station and the master station
1015	GPS Ionospheric Correction Differences for all satellites between one Aux station and the master station
1016	GPS Geometric Correction Differences for all satellites between one Aux station and the master station
1017	GPS Combined Geometric and Ionospheric Correction Differences for all satellites between one Aux station and the master station (same content as both types 1015 and 1016 together, but less size)

Type	Content
1018	RESERVED for Alternative Ionospheric Correction Difference Message Message type 1018 is not yet defined.

Per Aux station at least one message type 1014 and one message type 1017 are required. (Instead of one 1017 one 1015 and one 1016 can be used, but without gain in information, however with up to 20% higher data size.)

GNSMART supports the messages types 1014 trough 1017 since April 2007

Ephemeris Data

Type	Content
1019	GPS Ephemeris
1020	GLONASS Ephemeris

GNSMART supports the messages types 1019 and 1020 since 2005-12-19

UTF8 Text Message

For arbitrary text messags in UTF-8 format (multibyte characters, an extended ASCII format) a special message is expected.

Type	Content
1029	Text in UTF8 format (max. 127 multibyte characters and max. 255 bytes)

GNSMART supports the messages types 1029 since 2007-04-10

RTCM 3.1 Addendum 1

The Addendum 1 to RTCM 3.1 has been confirmed by RTCM at May 21th, 2007. It introduces 8 new message types for transformation parameters.

Transformation Message

The types 1021 through 1028 are supposed for Transformation Messages with transformation parameters for datum transformation and projections. The following message types are expected:

Type	Content

Type	Content
1021	Helmert / Abridged Molodenski Transformation
1022	Molodenski-Badekas Transformation
1023	Transformation Residual Message, ellipsoidal grid representation
1024	Transformation Residual Message, plane grid representation
1025	Projection types except LCC2SP, OM
1026	Projection type Lambert Conic Conformal (LCC2SP)
1027	Projection type Oblique Mercator (OM)
1028	RESERVED for Global to Plate Fixed Transformation (Message type 1028 is not yet defined.)

Further information about RTCM coordinate transformations can be found at "*OGP Surveying and Positioning Guidance Note Number 7, part 2 – Coordinate Conversions and Transformations includinf Formulas*" and EPSG database Version 6.11_2 at http://www.eps.org/ or at the European Coordinate Reference System (CRS) website at http://www.crs.bkg.bund.de/.

GNSMART supports the message types 1021 though 1028 not yet.

RTCM 3.1 Addendum 2

The Addendum 2 to RTCM 3.1 has been be confirmed by RTCM at August 31th, 2007. It introduces 4 new message types for use in network operation.

Network Residuals Messages

The types 1030 and 1031 are supposed for additional informationen in networked reference station operation (MAC or FKP or VRS). The following message types are expected:

Type	Content
1030	GPS Network Residuals
1031	GLONASS Network Residuals

GNSMART supports the messages types 1030 and 1031 since May 2007.

ARP Message for VRS

The type 1032 is supposed for additional informationen in virtual reference station operation (VRS). The following message type is expected:

Type	Content
1032	ARP station coordinates, ECEF XYZ of real reference station

GNSMART supports the messages types 1032 experimentally since March 2007

Receiver and Antenna Descriptor

The type 1033 is supposed to contain in addition to the antenna data from 1008 some receiver information. The following message type is expected:

Type	Content
1033	Receiver and Antenna Descriptor

The message type 1033 can be sent instead of 1007 or 1008

GNSMART supports the messages types 1033 experimentally since May 2007

RTCM 3.1 Further Addendums

Further message types proposed for the next future are FKP for GPS and GLONASS, and MAC for GLONASS.

Network FKP Messages

The (preliminary) types 1034 and 1035 are supposed for FKP network parameters and will probably be confirmed by RTCM in 2007 or 2008. The following message types are expected:

Type	Content
1034	GPS FKP
1035	GLONASS FKP

GNSMART supports the messages types 1034 and 1035 experimentally since March 2007

Proprietary Messages

The RTCM 3.x message types 4001 through 4095 are reserved for proprietary use. Each manufacturer may be assigned by RTCM one message type. For **Geo++** proprietary messages (also refered as **RTCM3++**) the message type **4090** is reserved.

Type	Content
4088	IfEN proprietary message (http://www.ifen.com)
4089	Septentrio proprietary message (http://www.septentrio.com)
4090	Geo++ proprietary message (http://www.geopp.de)
4091	Topcon Positioning Systems proprietary message (http://www.topconpositioning.com)
4092	Leica Geosystems proprietary message (http://www.leica-geosystems.com)
4093	NovAtel Inc. proprietary message (http://www.novatel.ca)
4094	Trimble Navigation Ltd. proprietary message (http://www.trimble.com)
4095	Magellan Navigation Inc. proprietary message (http://www.magellangps.com)

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