



Recommendation ITU-R SM.2080-0
(08/2015)

**Precision of time information in output data
of monitoring receivers**

SM Series
Spectrum management



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Foreword

The role of the Radiocommunication Sector is to ensure the rational, equitable, efficient and economical use of the radio-frequency spectrum by all radiocommunication services, including satellite services, and carry out studies without limit of frequency range on the basis of which Recommendations are adopted.

The regulatory and policy functions of the Radiocommunication Sector are performed by World and Regional Radiocommunication Conferences and Radiocommunication Assemblies supported by Study Groups.

Policy on Intellectual Property Right (IPR)

ITU-R policy on IPR is described in the Common Patent Policy for ITU-T/ITU-R/ISO/IEC referenced in Annex 1 of Resolution ITU-R 1. Forms to be used for the submission of patent statements and licensing declarations by patent holders are available from <http://www.itu.int/ITU-R/go/patents/en> where the Guidelines for Implementation of the Common Patent Policy for ITU-T/ITU-R/ISO/IEC and the ITU-R patent information database can also be found.

Series of ITU-R Recommendations

(Also available online at <http://www.itu.int/publ/R-REC/en>)

Series	Title
BO	Satellite delivery
BR	Recording for production, archival and play-out; film for television
BS	Broadcasting service (sound)
BT	Broadcasting service (television)
F	Fixed service
M	Mobile, radiodetermination, amateur and related satellite services
P	Radiowave propagation
RA	Radio astronomy
RS	Remote sensing systems
S	Fixed-satellite service
SA	Space applications and meteorology
SF	Frequency sharing and coordination between fixed-satellite and fixed service systems
SM	Spectrum management
SNG	Satellite news gathering
TF	Time signals and frequency standards emissions
V	Vocabulary and related subjects

Note: This ITU-R Recommendation was approved in English under the procedure detailed in Resolution ITU-R 1.

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Precision of time information in output data of monitoring receivers

(2015)

Scope

This Recommendation provides examples of possible measurement methods for the accuracy of the time information in I/Q data of a monitoring receiver.

Keywords

I/Q data, time stamp accuracy

The ITU Radiocommunication Assembly,

considering

- a) that precise time information in I/Q data is of great relevance in the field of radio monitoring;
- b) that ambiguities of the time stamp specification between users and different manufacturers may lead to misunderstanding of time information in the I/Q data;
- c) that the internal clock of a monitoring receiver will drift if no measures are taken to maintain timing accuracy;
- d) that, depending on the settings of a monitoring receiver, there are different time delays between the arrival of the signal at the RF input connector and the moment of the insertion of the precise time information in the I/Q data;
- e) that a well-defined specification for precise time information in I/Q data, if adopted by manufacturers of radio monitoring receivers, will benefit users by providing an easier and more objective comparison of similar products from different manufacturers,

recommends

- 1 that the accuracy of the time information in the I/Q data stream is constant for every sample pair (I/Q) in order to be able to mark even short-duration, intermittent or pulsed signals with the same accuracy;
- 2 that the precise time information in the I/Q-data is referenced to the RF input connector of the monitoring receiver to prevent the signal propagation delay in the receiver from influencing the time stamp;
- 3 that the internal clock of a monitoring receiver is synchronized with a high precision clock;
- 4 that the accuracy of the time information in I/Q data of a monitoring receiver is defined by the deviation between the reference time and the time stamp provided by the receiver, expressed by mean value and standard deviation;
- 5 that the accuracy of the time information in I/Q data of a monitoring receiver and the measurement method is specified by the manufacturer in their datasheet. Examples of possible methods are shown in the annexes.