

Technical specifications of COMET Cloud service

1. Service specification

COMET Cloud is a collecting system designed for storage, visualisation and alerting of the values measured by devices manufactured by company COMET SYSTEM, s.r.o., ID No 60776846, with registered office at Bezručova 2901, 756 61 Rožnov pod Radhoštěm (further referred to as “the Operator”). Within the technology options, the COMET Cloud is designed to be available 24 hours a day and 365 days a year. However, as with any other complex system, it is impossible to guarantee availability 100 % of the time. This document shall define the technical specifications and the anticipated availability of the COMET Cloud service.

2. Outage of the service

The outage of the service occurs when the service is completely unavailable or when the performance criteria for the respective service are not met.

The outage of the service does not occur when the maintenance or updates are carried out during the planned maintenance windows.

Also, the outage of the service does not occur when the unavailability of the system is caused by force majeure (e.g. natural disasters, wars, terrorist attacks, governmental decisions, cybernetic attacks) or by failure due to unavailability of net infrastructure not directly administered by the Operator.

3. Service availability

COMET Cloud provides the basic services for data collection, presentation of values via the web interface, sending messages when the alarm limits are exceeded and other additional services. The availability of individual services is quantified by the percentage of available time for a specified period. The availability is quantified for a normal - so-called intended use¹³.

3.1 Data Collection

The reliability of data transfer from the individual devices to COMET Cloud depends on the technology used for the transfer. The transfer chain may contain several subsequent parts. The overall availability is made by the product of the individual parts of the transfer chain. The reliability of the chain parts that are outside of the Operator’s direct control cannot be quantified. Therefore, for these parts, availability is not defined.

IoT Sensor (Sigfox) sensors

Part of the transfer chain	Estimated availability
Radio transfer	n/a ¹⁾
Data reception in COMET Cloud	98.50% ²⁾

IoT Sensor (LoRa) sensors

Part of the transfer chain	Estimated availability
Radio transfer	n/a ¹⁾
Data reception in COMET Cloud	99.60% ²⁾

WiFi sensors

Part of the transfer chain	Estimated availability
WiFi transfer	n/a ³⁾
ISP connectivity	n/a ⁴⁾
Data reception in COMET Cloud	99% ⁵⁾

Web Sensor (t-line, p-line, h-line)

Part of the transfer chain	Estimated availability
LAN connection	n/a ⁶⁾
ISP connectivity	n/a ⁴⁾
Data reception in COMET Cloud	99% ⁵⁾

IoT wireless datalogger with GSM modem and IoT SIM

Part of the transfer chain	Estimated availability
Radio transfer via GSM network	n/a ⁷⁾
Data reception in COMET Cloud	98.75% ⁸⁾

3.2 Web presentation

Web interface for COMET Cloud is designed for presentation of measured values, remote sensors' setting and setting of the COMET Cloud itself. The estimated availability of the COMET Cloud web interface is 99% ⁹⁾. The outage of service does not occur when the website shows a slower response in peak times.

3.3 Alerting and other services

Service	Estimated availability
Alarms evaluation	99.50% ¹⁰⁾
E-mails delivery	n/a ¹¹⁾
Generating the automatic reports	99% ¹²⁾

Notes

1) For data transfer from the device to the base station, the radio transfer in a non-licence zone of 868 MHz is used. The transfer quality depends on the local installation conditions and the current meteorological situation. Due to these reasons, the quality of the radio transfer cannot be quantified. It is recommended to install the device in a place with sufficient Sigfox (LoRa) network coverage and follow the recommendations of the user's manual.

2) The reliability of message delivery from the sensor to COMET Cloud with sufficient Sigfox network coverage is 98.50%. Some messages transferred from the Sigfox network might be delayed. The

probability of message delivery within one minute after its sending from the device is defined as 97.75%.

3) The signal quality with connection to a 2.4Ghz WiFi network depends on the local conditions of sensor installation and network infrastructure at the end user. Due to these reasons, the availability of a WiFi signal cannot be quantified. WiFi sensors have integrated memory, which is used when the COMET Cloud connection is unavailable. This memory may be used to span the short outage of a WiFi network or ISP connection without losing the measured data.

4) The availability of the internet connection at the sensor installation place is not defined.

5) The maximum outage of reception of the messages from the sector has been calculated as 21.8 hours per calendar quarter.

6) Depends on the local network infrastructure of the place where the sensor is installed, which is why this parameter cannot be quantified by the operator of COMET Cloud. The Web Sensors do not have integrated memory for values that haven't been sent to COMET Cloud. When the LAN or ISP connection is lost, the values sent to COMET Cloud are lost.

7) The availability of GSM signal and flawless operation of the GSM network is not quantified by the operator of COMET Cloud service. The devices have integrated memory that may be used to span the short outage of the GSM network.

8) The maximum calculated outage of data reception from the datalogger is 27.3 hours per calendar quarter.

9) The maximum calculated period of outage of the web interface is 21.8 hours per calendar quarter.

10) The availability of the service for alarm processing in the core of the COMET Cloud if the measured values via data collection are available.

11) The delivery of e-mails to the recipient's inbox cannot be quantified due to the possibility of rejection of the message by the recipient's server (e.g. message tagged as spam).

12) The availability of the service for generating automated reports is set to 99%. The outage of the service does not occur when the report is generated within 48 hours.

13) The availability is not quantified for other than intended use. This means that for example, the access to the web presentation is intended to be used by real persons, not by automated systems, robots, etc.