



Gmax Race Probability Data Feed Specification

Will Bradley

31st January 2019

- The Gmax Race system tracks race horses during real-time. Its minimal infrastructure makes it easy and economical to use, and allows the system to be shared between racecourses where travel times permit.
- The data can be used to estimate the probability of each horse winning the race live whilst the race is running, based on a combination of the live data and historical performance. This data has applications in commentary and presentation of racing and for use by players or operators of in-race gambling markets.
- This document describes the protocol for a 'Probability' feed, which provides the estimated probability of results whilst the race is running. The version described here provides the probability of each horse to win, other result types such as Place, AvB, Trifectas, etc. are under development.
- Other data feeds of tracking data are also available. The system is under active development. Feedback on possible future improvements is welcome.

- The Gmax Race system provides the following information for each tracked horse

Description	Name	Type	Example	Notes
Message Type	K	Number	6	To aid identification of messages from this feed
Timestamp	T	String	2015-06-10T19:41:27.0Z	UTC time in ISO 8601 format
Horse/Race ID	I	String	2720150610204002	Identifier specifying racecourse, date, race start time and horse number
Probability of winning	PW	Number	0.0495	The estimated probability that the horse in question will win

- Each position update for each horse is formatted as a ECMA-404 JSON object, e.g.:

```
{"K":6,"T":"2015-06-10T19:41:27.0Z","I":"2720150610204002","PW":0.0495}
```

- An update for each horse will be output once per second where available during the race.
- Gmax server(s) will send this stream of data using UDP to a static IP address/port to be provided to Gmax in advance by the end user. The end user must open and listen to this port to receive the data.

- Format
 - JSON has been selected due to its very wide usage, simplicity and efficiency. It is ideal for live data.
 - UDP is a standard protocol applicable for real-time data due to its simplicity and low latency. However, note that UDP provides for no guarantee of packet delivery, packet order, and duplicate packets may be generated by the network. Applications consuming this feed should be tolerant to such errors.
- Accuracy and Latency
 - The timestamp is synchronised to UTC time, with an estimated accuracy of ± 0.01 s. The timestamp reflects the epoch of the data upon which the contents of the packet are derived (as opposed to the time at which the packet is generated).
 - Updates will be provided at fixed 1 second intervals in the feed. Latency may vary depending on conditions, but can be estimated by the client by comparison of the current time with the timestamp of each packet.
- Horse/Race identifier
 - This allows unique identification of the race, composed as follows:
[2-digit racecourse ID][scheduled start: YYYYMMddHHmm][Horse number]
 - The racecourse ID follows the convention used by Weatherbys for the UK. Contact us for a list of available racecourses/IDs
- Win Probability
 - Probability values range from 0.0000 (no chance) to 1.0000 (certainty).
- Sample data
 - Sample data from some previously recorded races is available, please enquire for more details
 - Upon request, pre-recorded data can also be streamed live to your server for test purposes

- Every effort will be made to maintain the feed as reliably as possible. However, we advise end users to consider the following failure modes, some of which may be beyond Gmax's control

Failure Mode	Likely Effect on data feed
Network errors between base station (racecourse) and client	There may be gaps in the data feed, packets may be duplicated or arrive in the wrong order
System wide failure – for example, due to failure on the tracking base station, operator not able to attend race etc.	Data feed may be interrupted/unavailable
Error affecting availability of data for one or more horses. E.g. tracker damage, miss-assignment	Data may appear but be invalid. Validity of data may be possible to establish with reference to other data (e.g. other Gmax data feeds, TV broadcast, 3 rd party gambling exchange prices etc.)

- Subscribers to this feed will be kept informed of updates, and as far as possible this will be introduced by extending the data feed described herein to ensure backward compatibility. End users should design their applications to be tolerant to additional JSON messages/objects appearing in the data in future.
- Consultation is currently underway on improvements to the horse/racecourse identifier to provide better support for operations globally. This will result in an increased size of racecourse identifier, and possibly the splitting of the current identifier into separate parameters.

Other complementary feeds are also available, including:

- Live 'Progress' data feed, which summarises the progress of the race as a whole including live sectional times of the leading horse, running order of the horses and list of valid runners. Provided as a live low-latency data feed.
- Live Tracking data feed, providing the co-ordinates, speed, and estimated distance remaining for each tracked horse in the race.
- By prior arrangement only: a test data feed streaming replays of pre-recorded examples of one or more of the above data feeds, intended for use in final testing by client applications.
- Historical 'Points': a data feed similar to the data in the live tracking feed but provided from archived races, available from an http request.
- Post-race sectional time data feed, summarising the performance of each horse by section (e.g. at furlong intervals), available from an http request.
- Racecourse 'Routes': downloadable files containing a description of the official running line at racecourses, derived from on-site surveys.
- Please let us know your requirements and we can recommend the most suitable data for your needs.

The background of the image is a hazy, golden-hour scene of a horse race track. In the foreground, several riders on horses are silhouetted against the bright, hazy sky. They appear to be in motion, possibly during a race or a training session. The track is dark and dusty, with a large cloud of dust or mist rising from the horses' hooves. In the background, a large crowd of spectators is visible, also silhouetted against the bright sky. Several tall, thin poles with rectangular signs are visible on both sides of the track. The overall atmosphere is one of a busy, active horse racing event.

Gmax

Gmax Technology Ltd., Church Road, Toft, Cambridge, UK
Phone: +44 1223 264428 Email: info@gmaxequine.com