

Goal-line technology (GLT) specifications

Preamble

The Fédération Internationale de Football Association (FIFA) is the world governing body for the sport of association football, which it promotes on a worldwide basis through its development programmes as well as by organising, supervising and promoting international association football competitions.

The International Football Association Board ("IFAB") is made up of representatives of the following four football associations, England's Football Association (The FA), the Scottish Football Association (SFA), the Football Association of Wales (FAW) and Northern Ireland's Irish Football Association (IFA), as well as FIFA.

The IFAB is currently considering the introduction of goal-line technology ("GLT") into the sport of association football for the purpose of verifying whether a goal has been scored or not to support the referee's decision. For this purpose, the IFAB has appointed FIFA to evaluate the current technology status, whereby an independent testing institute will test the accuracy and fitness of the technology providers' GLT. The final results of this evaluation will be presented to the IFAB at a special meeting in July 2012, under consideration of the following timeline:

- (i) Technology providers' expression of interest to participate in the tests
(3 May – 3 June 2011)
- (ii) Technology providers' confirmation of participation by means of signing a registration form
(6 June – 7 July 2011)
- (iii) Testing phase 1 *(September – December 2011)*
- (iv) Testing phase 2 *(March – June 2012)*

This document details some of the requirements and technology specifications that must be fulfilled by the technology provider.

The GLT test will be conducted in a football stadium, selected and organised by the respective technology providers, upon consultation with and the consent of FIFA.

FIFA will decide at its sole discretion about whether to admit a technology provider to the test procedure. Admission will, among other aspects, require the written execution of a registration form by the technology provider and FIFA. This document does not grant any rights to a technology provider. It remains subject to changes or amendments by FIFA.

1. Principles

The IFAB has laid down a set of four basic requirements that a GLT system has to fulfil:

- (i) The GLT technology applies solely to the goal line and only to determine whether a goal has been scored or not;
- (ii) The GLT system must be accurate;
- (iii) The indication of whether a goal has been scored must be immediate and automatically confirmed within one second;
- (iv) The indication of whether a goal has been scored will only be communicated to the match officials (via the referee's watch, by vibration and visual signal).

2. Requirements

- The GLT system must work automatically and independently for the entire duration of the tests, without any interference by the technology provider.
- The GLT must be able to be used without any problems on both natural grass and football turf.
- The system must work in lighting conditions of at least 800 lux.
- Balls
 - FIFA will provide the balls (adidas Jabulani) for the tests.
 - The technology provider is allowed to conduct the tests with its own balls. A minimum of five balls, in colours for normal and inclement weather, must be sent to the independent test institute two months before the test date. The balls must be
 - either “FIFA approved,” or
 - approved by the independent test institute.
- Referee’s watch
 - Optical display and vibration of a goal for at least ten seconds and for a maximum of 20 seconds must be communicated to the referee’s watch within 1s
 - Battery life: more than 4h
 - At least six watches must be available (for referee and assistant referees)

3. Pass/fail criteria (to proceed to testing phase 2)

- Goal indication to the referee’s watch must be automatically displayed within 1s, by vibration and a visual signal;
- Range: full coverage of pitch (and technical area surrounding the pitch)
- 100% of free shots on goal (or “no goal” for near misses or shots into side-netting) must be correctly recognised (point 4b);
- Sled test: 90% of all goal situations must be displayed correctly within a tolerance of -3/+3cm of the goal line (point 4c);
- Shots against impact wall: 90% of all goal situations must be displayed correctly within a tolerance of -3/+5cm of the goal line (point 4d);

Based on the results from the criteria specified above, the IFAB (together with the test institute) will decide whether or not a technology provider qualifies for testing phase 2. The technology provider must waive all rights in relation to such decision, in particular the right to initiate legal proceedings against FIFA or the test institute and/or to receive test results or further information.

4. General test information (testing phase 1)

- The tests will be conducted behind closed doors. Only members of the IFAB, FIFA and the technology provider (list of names to be provided beforehand) will be allowed to be present at the tests.
- There will be a standard procedure for the tests conducted by the independent test institute.
- There will be a test in daylight and a test at night (→ under floodlights). The night test will be shorter in terms of scope and duration. Both tests will be conducted on the same day.
- During the tests, the technology providers must remain in the area defined by the test institute before the tests. During the tests, the technology providers may only ask the independent test institute questions through the FIFA representative.

- Any additional tests that may be necessary (decision to be taken by test institute and FIFA) shall be conducted immediately after the official tests.
- During the tests, the technology provider will be responsible for security and insurance in the stadium.
- Communication with the media will be conducted only in consultation with and with the approval of FIFA.
- Costs
 - to be covered by technology provider
 - USD 20,000 registration fee (100% refund by FIFA if technology provider proceeds to testing phase 2; to be decided by FIFA at its sole discretion)
 - All stadium-related fees (incl. for example, rental, security, insurance)
 - All other individual costs related to the test procedures, other than those covered by FIFA
 - covered by FIFA
 - Independent test institute (incl. transportation, accommodation, etc.)
 - Stadium rental fee (excluding any other fees in relation to the test procedures such as costs for security, insurance etc.) up to a maximum of USD 20,000, only if the technology provider proceeds to testing phase 2

4a) Test procedure

- A ball shooting machine will be placed at least 6m from the goal line.
- The tests will be conducted in daylight and under floodlights.
- The tests will be conducted in 45-60 minute sessions without a break.
- The tests will be conducted on the agreed date, regardless of the prevailing weather conditions.
- The goal shall be of the same dimensions as a standard football goal (7.32m x 2.44m) and be equipped with a net of a depth of at least 1.5m (on the ground).
- The area behind and next to the goal shall be kept clear for at least 2m.
- The technology provider shall provide the following:
 - electricity power points (CEE plug; 16A, 400V)
 - shelter/tent
 - tables/chairs
- The test institute experts must have access to the GLT system (and all related components) at all times.
- During the tests, no manual calibrations or adjustments that would delay the tests may be made to the GLT system (unless they run automatically in the background).
- FIFA and the test institute are free to amend or modify the test requirements.

4b) Free shots on goal

- 100% of the shots in and around the goal must be displayed correctly (including side-netting).
- The system must only indicate a goal if the whole of the ball has crossed the goal line between the posts and under the crossbar. No object or person crossing the goal line may activate the GLT system to indicate a goal.

4c) Sled test

- Determination of quasi-static accuracy
- Ball speed of at least 1cm/s
- Ball possibly rotating

4d) Shots against impact wall

- Determination of dynamic accuracy
- Size and shape of impact wall to be similar to that of a goalkeeper (size: 190cm).
- Sight hidden by dummy players (size: 185cm)

5. Provisional information for testing phase 2

These tests will be conducted in 2012 (March to June 2012). The second testing phase will comprise more statistics (increased number of shots, speeds and elevations), as well as more simulated game and environmental simulations (e.g. second ball outside the line, people moving and standing close to the posts, etc.). Finally, assuming a GLT is able to detect the scoring of a goal reliably under testing phase 2 conditions, the overall system reliability for real-life conditions must be assessed as well. This should include (non-exhaustive list):

- software reliability
- transmission signal quality
- energy source (battery life time etc.)
- performance under changing ambient conditions (rain, sun, wind, fog, etc.)
- proof of shock resistance
- immunity to external distortions (electronic interference, electro-magnetic radiation, mechanical stress, etc.)
- tests on various types of pitches (green, mud, artificial turf) and in stadiums
- tests with human players
- different lighting conditions as per the FIFA requirements for the 2014 FIFA World Cup Brazil™

The results of the test procedures are only intended to be used by FIFA for a technical presentation to IFAB at its special meeting in July 2012, but shall not be decisive for a decision to be taken by IFAB (at its sole discretion). The participation in these test procedures, including the passing of the testing phase 2, does not give any technology provider a right to be appointed service provider, licensee or other contractual partner of FIFA or IFAB.