

AUTOMATIC AND ACCURATE ADJUSTMENT DEVICE, METHOD AND SYSTEM FOR PREFABRICATED BEAM BODY FORMWORK

Field of the Invention

The present invention relates to the technical field of adjustment of the beam body formwork of the bridge, in particular to an automatic and accurate adjustment device, a method and a system for a prefabricated beam body formwork.

Background of the Invention

Prefabricated beam body construction is widely used in high-speed railways, highways and municipal bridges, and with the promotion and development of prefabricated bridges, the proportion of prefabricated beam bodies is increasing. In order to improve the construction efficiency and quality of the prefabricated beam body, a large number of prefabricated beam body formworks adopt hydraulic formworks. With the requirement of accelerating the intelligent and automated construction market, the manually controlled hydraulic formwork has gradually developed into the hydraulic formwork with an automatic hydraulic control system.

During the use of the prefabricated beam body hydraulic formwork, the hydraulic formwork needs to be measured and precisely adjusted to meet the dimensional accuracy requirements of the prefabricated beam body. At present, the hydraulic formwork with automatic hydraulic control system adopts the displacement reading of the hydraulic jack arranged at the lower part of the outer side of the formwork to indirectly measure the offset value of the formwork (usually measure the offset value of several points on the top opening of the formwork), namely relying on the displacement sensor of the hydraulic jack to indirectly measure the offset value of the hydraulic formwork, which has a large measurement error. In addition, after the prefabricated beam body hydraulic formwork is used for many times, the hydraulic formwork will be randomly deformed, resulting in a larger measurement error. The offset (deviation) value of the hydraulic formwork indirectly measured by the sensor is difficult to meet the requirements of precise adjustment of the prefabricated beam body hydraulic formwork due to the large error. Therefore, it is usually necessary to rely on manual measurement to measure again to meet the requirements of the precision adjustment, and the adjustment efficiency of the formwork is very low.

Summary of the Invention

In view of the defects existing in the prior art, the purpose of the present invention is to provide an automatic and accurate adjustment device, a method and a system for a prefabricated

beam body formwork, so as to solve the problem that the measurement error of the deviation value of the prefabricated beam body formwork in the prior art is too large to meet the requirements of precision adjustment of the formwork; or the problem that the adjustment efficiency of the formwork is very low because it is necessary to be measured again manually to meet the requirements of the precision adjustment.

In order to achieve the above purpose, the technical solution adopted by the present invention is: an automatic and accurate adjustment device for a prefabricated beam body formwork, with a geometric center of a bottom surface of the prefabricated beam body formwork as an origin O, a length direction of the prefabricated beam body formwork as an X-axis, a width direction of the prefabricated beam body formwork as a Y-axis, and a height direction of the prefabricated beam body formwork as a Z-axis, establishing a three-dimensional rectangular coordinate system, comprising:

- a calibration assembly, which comprises a plurality of calibration units, the plurality of the calibration units are arranged at a symmetrical interval along the X-axis on a plurality of inspection sections on an outer mold side of the prefabricated beam body formwork, and each of the calibration units is provided with a calibration point;

- an adjustment assembly, which comprises a plurality of adjustment units in one-to-one correspondence with the calibration units, and each of the adjustment units is fixedly connected with the outer mold of the prefabricated beam body formwork;

- a measurement assembly, which is configured to measure and obtain actual three-dimensional coordinates of each of the calibration points; and

- a calculation control assembly, which is configured to calculate differences between the actual three-dimensional coordinates of each of the calibration points and preset theoretical three-dimensional coordinates thereof, and automatically control the adjustment assembly to adjust the actual three-dimensional coordinates of the corresponding calibration point when the differences exceed a preset range, such that the differences corresponding to each of the calibration points fall within the preset range.

On the basis of the above technical solution, each of the adjustment units comprises:

- a first jack, which is arranged under the outer mold side of the prefabricated beam body formwork, and a piston end of the first jack is provided with a first telescopic rod;

- a second jack, which is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the second jack is provided with a second telescopic rod;

- a third jack, which is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the third jack is provided with a third telescopic rod; and

a receiving piece, which is respectively connected with the first telescopic rod, the second telescopic rod and the third telescopic rod, and the receiving piece is fixed with the outer mold of the prefabricated beam body formwork.

On the basis of the above technical solution, the adjustment assembly further comprises a hydraulic power unit, which is configured to receive an instruction from a control center to drive the pistons of the first jack, the second jack and the third jack to telescopically move, so as to adjust the actual three-dimensional coordinates of the calibration points.

On the basis of the above technical solution, each of the calibration units comprises a calibration prism, and a center of the calibration prism is the calibration point.

On the basis of the above technical solution, the measurement assembly comprises a station pier, the station pier is provided with an automatic measuring total station and a station point, and the automatic measuring total station is configured to measure a distance, a horizontal angle and a vertical angle between the station point and any one of the calibration points.

The purpose of the present invention is to provide a method for adjusting the automatic and accurate adjustment device for the prefabricated beam body formwork, comprising the following steps:

arranging the plurality of calibration units of the calibration assembly at a symmetrical interval along the X-axis direction on the plurality of inspection sections on the outer mold of the prefabricated beam body formwork, and providing a calibration point on each of the calibration units;

fixedly connecting the plurality of adjustment units of the adjustment assembly with the outer mold of the prefabricated beam body formwork, with the adjustment units in one-to-one correspondence with the calibration units;

adopting the measuring device to automatically measure and obtain actual three-dimensional coordinates of all of the calibration points; and

calculating differences between the actual three-dimensional coordinates of each of the calibration points and preset theoretical three-dimensional coordinates thereof by the calculation control assembly, and automatically controlling the adjustment assembly to adjust the actual three-dimensional coordinates of the corresponding calibration point when the differences exceed a preset range, such that the differences corresponding to each of the calibration points fall within the preset range.

On the basis of the above technical solution, the method further comprises the following steps:

arranging a first jack of each of the adjustment units under the outer mold of the prefabricated beam body formwork, and providing a piston end of the first jack with a first telescopic rod;

arranging a second jack of each of the adjustment units under the outer mold of the prefabricated beam body formwork, and providing the piston end of the second jack with a second telescopic rod;

arranging a third jack of each of the adjustment units under the outer mold of the prefabricated beam body formwork, and providing the piston end of the third jack with a third telescopic rod; and

respectively connecting two ends of a receiving piece of each of the adjustment units with the first telescopic rod, the second telescopic rod and the third telescopic rod, and fixing the receiving piece with the outer mold of the prefabricated beam body formwork.

On the basis of the above technical solution, the method further comprises the following step: a hydraulic power unit of the adjustment assembly receives an instruction from a control center to drive the pistons of the first jack, the second jack and/or the third jack to telescopically move, so as to adjust the actual three-dimensional coordinates of the calibration points.

On the basis of the above technical solution, each of the calibration units is provided with a calibration prism, and a center of the calibration prism is taken as the calibration point; and

the measurement assembly is provided with a station pier, the station pier is provided with an automatic measuring total station and a station point, and the automatic measuring total station is adopted to measure a distance, a horizontal angle and a vertical angle between the station point and any one of the calibration points.

The purpose of the present invention is to provide an automatic and accurate adjustment system for a prefabricated beam body formwork, comprising at least two automatic and accurate adjustment devices for the prefabricated beam body formwork, wherein the adjustment system further comprises:

a control management device, which is configured to preset theoretical three-dimensional coordinates of a calibration point of each of the adjustment devices and send the theoretical three-dimensional coordinates to the corresponding calculation control assembly;

a data management device, which is configured to collect and store measurement data and calculation data of each of the adjustment devices; and

a video monitoring device, which comprises a plurality of video monitoring assemblies in one-to-one correspondence with each of the adjustment devices, each of the video monitoring assemblies comprises a camera and a display, and the camera is configured to obtain a real-time image of the corresponding adjustment device and display the real-time image through the corresponding display.

Compared with the prior art, the present invention has the following advantages:

The present invention provides an automatic and accurate adjustment device, a method and a system for a prefabricated beam body formwork, the calibration points are integrated with the prefabricated beam body formwork, and the adjustment units are automatically controlled according to the deviation value of each of the calibration points, so that the differences between the actual coordinates corresponding to each of the calibration points and the preset theoretical three-dimensional coordinates thereof are within a preset range, and the offset of the prefabricated beam body formwork is accurately adjusted. The present invention directly measures and accurately adjusts the prefabricated beam body formwork through the calibration points, which not only overcomes the problem of large error caused by the indirect measurement in the prior art, but also overcomes the disadvantage of relying on manual measurement to accurately adjust the formwork again, which has the characteristics of intelligent and automatic measurement and greatly improves the construction efficiency.

Brief Description of the Drawings

Fig. 1 is a three-dimensional coordinate diagram established with a prefabricated beam body formwork in the embodiment of the present invention;

Fig. 2 is a schematic diagram of an automatic and accurate adjustment device for a prefabricated beam body formwork in the embodiment of the present invention;

Fig. 3 is a layout diagram of an automatic and accurate adjustment device for a prefabricated beam body formwork in the embodiment of the present invention;

Fig. 4 is a schematic diagram of an automatic and accurate adjustment system for a prefabricated beam body formwork in the embodiment of the present invention.

Detailed Description of the Embodiments

The present invention will be further described below in detail with reference to the drawings in combination with the embodiments.

As shown in Fig. 1, on the one hand, the embodiment of the present invention provides an automatic and accurate adjustment device for a prefabricated beam body formwork, with a geometric center of a bottom surface of the prefabricated beam body formwork as an origin O, a length direction of the prefabricated beam body formwork as a X-axis, a width direction of the prefabricated beam body formwork as a Y-axis, and a height direction of the prefabricated beam body formwork as a Z-axis, a three-dimensional rectangular coordinate system is established. The device comprises a calibration assembly, an adjustment assembly, a measurement assembly and a calculation control assembly.

As shown in Fig. 2 and Fig. 3, the calibration assembly comprises a plurality of calibration units, the plurality of the calibration units are arranged at a symmetrical interval along the X-axis on a plurality of inspection sections on an outer mold side of the prefabricated beam body formwork, and each of the calibration units is provided with a calibration point. Specifically, each of the calibration units comprise a calibration prism, and a center of the calibration prism is the calibration point. As shown in Fig. 2, the calibration prism is fixed to the prefabricated beam body formwork (i.e., the top opening of the formwork). When the prefabricated beam body formwork is not precisely positioned, the prefabricated beam body formwork is offset, and the center of the calibration prism will also be offset. In the automatic and accurate adjustment device for the prefabricated beam body formwork of the embodiment of the present invention, there are 5 inspection sections, which are respectively at the two ends, 1/4 length and 1/2 length of the outer mold side of the prefabricated beam body formwork.

The adjustment assembly comprises a plurality of adjustment units in one-to-one correspondence with the calibration units, and each of the adjustment units is fixedly connected with the outer mold of the prefabricated beam body formwork. Specifically, each of the adjustment units comprises: a first jack, a second jack, a third jack and a receiving piece. The first jack is arranged under the outer mold side of the prefabricated beam body formwork, and a piston end of the first jack is provided with a first telescopic rod. The second jack is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the second jack is provided with a second telescopic rod. The third jack is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the third jack is provided with a third telescopic rod. The receiving piece is respectively connected with the first telescopic rod, the second telescopic rod and the third telescopic rod, and the receiving piece is fixed with the outer mold of the prefabricated beam body formwork.

The adjustment assembly further comprises a hydraulic power unit, which is configured to receive an instruction from a control center to drive the pistons of the first jack, the second jack and/or the third jack to telescopically move, so as to adjust the actual three-dimensional coordinates of the calibration points.

As shown in Fig. 2, the first jack is arranged horizontally, and the second jack and the third jack are arranged vertically. When the pistons of the first jack, the second jack and/or the third jack telescopically move, the receiving piece is driven to move, and the receiving piece is fixed with the outer mold of the prefabricated beam body formwork, that is, the offset of the prefabricated beam body formwork (i.e. the top opening of the formwork) can be adjusted.

The measurement assembly is configured to measure and obtain actual three-dimensional

coordinates of each of the calibration points. Specifically, the measurement assembly comprises a station pier, and the station pier is provided with an automatic measuring total station and a station point. The automatic measuring total station is adopted to measure a distance, a horizontal angle and a vertical angle between the station point and any one of the calibration points, and then the three-dimensional coordinates of each of the calibration points are obtained through conversion.

Specifically, the measurement assembly further comprises a target pier, which is provided with a target prism. The centers of the target prism and the station point are coaxial with the X-axis, and the target prism is configured to perform an initial calibration on the automatic measuring total station. For example, if the coordinates of a known station point are supposed to be (x_0, y_0, z_0) , wherein $y_0=0$, the distance measured between the station point and a calibration point is m , the horizontal angle is α and the vertical angle is β , the coordinates of the calibration point can be obtained as (x_1, y_1, z_1) , wherein $x_1=x_0+m*\sin\beta*\cos\alpha$, $y_1=m*\sin\beta*\sin\alpha$, and $z_1=z_0+m*\cos\beta$.

The calculation control assembly calculates differences between the actual three-dimensional coordinates of each of the calibration points and preset theoretical three-dimensional coordinates thereof, and automatically controls the adjustment assembly to adjust the actual three-dimensional coordinates of the corresponding calibration point when the differences exceed a preset range, such that the differences corresponding to each of the calibration points fall within the preset range.

Compared with the prior art, the present invention provides an automatic and accurate adjustment device for a prefabricated beam body formwork. The calibration points are integrated with the prefabricated beam body formwork, and the adjustment units are automatically controlled according to the deviation value of each of the calibration points, so that the differences between the actual coordinates corresponding to each of the calibration points and the preset theoretical three-dimensional coordinates thereof are within a preset range, and the offset of the prefabricated beam body formwork is accurately adjusted. The present invention directly measures and accurately adjusts the prefabricated beam body formwork through the calibration points, which not only overcomes the problem of large error caused by the indirect measurement in the prior art, but also overcomes the disadvantage of relying on manual measurement to accurately adjust the formwork again, which has the characteristics of intelligent and automatic measurement and greatly improves the construction efficiency.

The embodiment of the present invention further provides a method for adjusting the above automatic and accurate adjustment device for the prefabricated beam body formwork, comprising the following steps:

S1: The plurality of calibration units of the calibration assembly are arranged at a symmetrical interval along the X-axis direction on the plurality of inspection sections on the outer mold of the

prefabricated beam body formwork, and each of the calibration units is provided with a calibration point. Specifically, each of the calibration units comprise a calibration prism, and the center of the calibration prism is the calibration point. As shown in Fig. 2, the calibration prism is fixed to the prefabricated beam body formwork. When the prefabricated beam body formwork is not precisely positioned, the center of the calibration prism will be offset. In the automatic and accurate adjustment device for the prefabricated beam body formwork of the embodiment of the present invention, there are 5 inspection sections, which are respectively at the two ends, 1/4 length and 1/2 length of the outer mold side of the prefabricated beam body formwork.

S2: The plurality of adjustment units of the adjustment assembly are fixedly connected with the outer mold of the prefabricated beam body formwork, and the adjustment units are in one-to-one correspondence with the calibration units. Specifically, each of the adjustment units comprises: a first jack, a second jack, a third jack and a receiving piece. The first jack is arranged under the outer mold side of the prefabricated beam body formwork, and a piston end of the first jack is provided with a first telescopic rod. The second jack is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the second jack is provided with a second telescopic rod. The third jack is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the third jack is provided with a third telescopic rod. The receiving piece is respectively connected with the first telescopic rod, the second telescopic rod and the third telescopic rod, and the receiving piece is fixed with the outer mold of the prefabricated beam body formwork.

The adjustment assembly further comprises a hydraulic power unit, which is configured to receive an instruction from the control center to drive the pistons of the first jack, the second jack and/or the third jack to telescopically move, so as to adjust the actual three-dimensional coordinates of the calibration points.

S3: The measurement assembly is adopted to automatically measure and obtain actual three-dimensional coordinates of all of the calibration points. Specifically, the measurement assembly comprises a station pier. The station pier is provided with an automatic measuring total station and a station point. The automatic measuring total station is adopted to measure a distance, a horizontal angle and a vertical angle between the station point and any one of the calibration points, and then the three-dimensional coordinates of each of the calibration points are obtained through conversion.

Specifically, the measurement assembly further comprises a target pier, which is provided with a target prism, the centers of the target prism and the station point are coaxial with the X-axis, and the target prism is configured to perform an initial calibration on the automatic measuring total station. For example, if the coordinates of a known station point are supposed to be (x_0, y_0, z_0) ,

wherein $y_0=0$, the distance measured between the station point and a calibration point is m , the horizontal angle is α and the vertical angle is β , the coordinates of the calibration point can be obtained as (x_1, y_1, z_1) , wherein $x_1=x_0+m*\sin\beta*\cos\alpha$, $y_1=m*\sin\beta*\sin\alpha$, and $z_1=z_0+m*\cos\beta$.

S4: The calculation control assembly calculates differences between the actual three-dimensional coordinates of each of the calibration points and preset theoretical three-dimensional coordinates thereof, and automatically controls the adjustment assembly to adjust the actual three-dimensional coordinates of the corresponding calibration point when the differences exceed a preset range, such that the differences corresponding to each of the calibration points fall within the preset range.

Compared with the prior art, the present invention provides an automatic and accurate adjustment method for a prefabricated beam body formwork. The calibration points are integrated with the prefabricated beam body formwork, and the adjustment units are automatically controlled according to the deviation value of each of the calibration points, so that the differences between the actual coordinates corresponding to each of the calibration points and the preset theoretical three-dimensional coordinates thereof are within a preset range, and the offset of the prefabricated beam body formwork is accurately adjusted. The present invention directly measures and accurately adjusts the prefabricated beam body formwork through the calibration points, which not only overcomes the problem of large error caused by the indirect measurement in the prior art, but also overcomes the disadvantage of relying on manual measurement to accurately adjust the formwork again, which has the characteristics of intelligent and automatic measurement and greatly improves the construction efficiency.

As shown in Fig. 4, the embodiment of the present invention further provides an automatic and accurate adjustment system for a prefabricated beam body formwork, comprising at least two automatic and accurate adjustment devices for the prefabricated beam body formwork, as well as a control management device, a data management device and a video monitoring device.

The control management device is configured to preset theoretical three-dimensional coordinates of a calibration point of each of the adjustment devices and send the theoretical three-dimensional coordinates to the corresponding calculation control assembly.

The data management device is configured to collect and store measurement data and calculation data of each of the adjustment devices.

The video monitoring device comprises a plurality of video monitoring assemblies in one-to-one correspondence with each of the adjustment devices. Each of the video monitoring assemblies comprises a camera and a display. The camera is configured to obtain a real-time image of the corresponding adjustment device and display the real-time image through the corresponding

display. The video monitoring device monitors each of the automatic and accurate adjustment devices for the prefabricated beam body formwork, understands the operation status thereof and implements the visual management.

Compared with the prior art, the embodiment of the present invention provides an automatic and accurate adjustment system for a prefabricated beam body formwork. The calibration points are integrated with the prefabricated beam body formwork, and the adjustment units are automatically controlled according to the deviation value of each of the calibration points, so that the differences between the actual coordinates corresponding to each of the calibration points and the preset theoretical three-dimensional coordinates thereof are within a preset range, and the offset of the prefabricated beam body formwork is accurately adjusted. The present invention directly measures and accurately adjusts the prefabricated beam body formwork through the calibration points, which not only overcomes the problem of large error caused by the indirect measurement in the prior art, but also overcomes the disadvantage of relying on manual measurement to accurately adjust the formwork again, which has the characteristics of intelligent and automatic measurement and greatly improves the construction efficiency.

In addition, the automatic and accurate adjustment system for the prefabricated beam body formwork in the embodiment of the present invention generally manages, controls and monitors the operation status of each of the automatic and accurate adjustment devices for the prefabricated beam body formwork, which reduces the manual intervention, realizes the visual management, and improves the overall formwork adjustment efficiency.

The present invention is not limited to the above-mentioned embodiments. One skilled in the art may make several improvements and modifications without departing from the principle of the present invention, and these improvements and modifications are also considered to be within the protection scope of the present invention. The contents that are not described in detail in the description belong to the prior art well known by one skilled in the art.

Claims

1. An automatic and accurate adjustment device for a prefabricated beam body formwork, with a geometric center of a bottom surface of the prefabricated beam body formwork as an origin O, a length direction of the prefabricated beam body formwork as an X-axis, a width direction of the prefabricated beam body formwork as a Y-axis, and a height direction of the prefabricated beam body formwork as a Z-axis, establishing a three-dimensional rectangular coordinate system, comprising:

a calibration assembly, which comprises a plurality of calibration units, the plurality of the calibration units are arranged at a symmetrical interval along the X-axis on a plurality of inspection sections on an outer mold side of the prefabricated beam body formwork, and each of the calibration units is provided with a calibration point;

an adjustment assembly, which comprises a plurality of adjustment units in one-to-one correspondence with the calibration units, and each of the adjustment units is fixedly connected with the outer mold of the prefabricated beam body formwork;

a measurement assembly, which is configured to measure and obtain actual three-dimensional coordinates of each of the calibration points; and

a calculation control assembly, which is configured to calculate differences between the actual three-dimensional coordinates of each of the calibration points and preset theoretical three-dimensional coordinates thereof, and automatically control the adjustment assembly to adjust the actual three-dimensional coordinates of the corresponding calibration point when the differences exceed a preset range, such that the differences corresponding to each of the calibration points fall within the preset range.

2. The automatic and accurate adjustment device for the prefabricated beam body formwork according to claim 1, wherein each of the adjustment units comprises:

a first jack, which is arranged under the outer mold side of the prefabricated beam body formwork, and a piston end of the first jack is provided with a first telescopic rod;

a second jack, which is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the second jack is provided with a second telescopic rod;

a third jack, which is arranged under the outer mold side of the prefabricated beam body formwork, and the piston end of the third jack is provided with a third telescopic rod; and

a receiving piece, which is respectively connected with the first telescopic rod, the second telescopic rod and the third telescopic rod, and the receiving piece is fixed with the outer mold of the prefabricated beam body formwork.

3. The automatic and accurate adjustment device for the prefabricated beam body formwork

according to claim 2, wherein

the adjustment assembly further comprises a hydraulic power unit, which is configured to receive an instruction from a control center to drive the pistons of the first jack, the second jack and the third jack to telescopically move, so as to adjust the actual three-dimensional coordinates of the calibration points.

4. The automatic and accurate adjustment device for the prefabricated beam body formwork according to claim 1, wherein each of the calibration units comprise a calibration prism, and a center of the calibration prism is the calibration point.

5. The automatic and accurate adjustment device for the prefabricated beam body formwork according to claim 1, wherein

the measurement assembly comprises a station pier, the station pier is provided with an automatic measuring total station and a station point, and the automatic measuring total station is configured to measure a distance, a horizontal angle and a vertical angle between the station point and any one of the calibration points.

6. A method for adjusting the automatic and accurate adjustment device for the prefabricated beam body formwork according to claim 1, comprising the following steps:

arranging the plurality of calibration units of the calibration assembly at a symmetrical interval along the X-axis direction on the plurality of inspection sections on the outer mold of the prefabricated beam body formwork, and providing a calibration point on each of the calibration units;

fixedly connecting the plurality of adjustment units of the adjustment assembly with the outer mold of the prefabricated beam body formwork, with the adjustment units in one-to-one correspondence with the calibration units;

adopting the measuring device to automatically measure and obtain actual three-dimensional coordinates of all of the calibration points; and

calculating differences between the actual three-dimensional coordinates of each of the calibration points and preset theoretical three-dimensional coordinates thereof by the calculation control assembly, and automatically controlling the adjustment assembly to adjust the actual three-dimensional coordinates of the corresponding calibration point when the differences exceed a preset range, such that the differences corresponding to each of the calibration points fall within the preset range.

7. The method according to claim 6, wherein the method further comprises the following steps:

arranging a first jack of each of the adjustment units under the outer mold of the prefabricated

beam body formwork, and providing a piston end of the first jack with a first telescopic rod;

arranging a second jack of each of the adjustment units under the outer mold of the prefabricated beam body formwork, and providing the piston end of the second jack with a second telescopic rod;

arranging a third jack of each of the adjustment units under the outer mold of the prefabricated beam body formwork, and providing the piston end of the third jack with a third telescopic rod; and

respectively connecting two ends of a receiving piece of each of the adjustment units with the first telescopic rod, the second telescopic rod and the third telescopic rod, and fixing the receiving piece with the outer mold of the prefabricated beam body formwork.

8. The method according to claim 7, wherein the method further comprises the following step:
a hydraulic power unit of the adjustment assembly receives an instruction from a control center to drive the pistons of the first jack, the second jack and/or the third jack to telescopically move, so as to adjust the actual three-dimensional coordinates of the calibration points.

9. The method according to claim 6, wherein
each of the calibration units is provided with a calibration prism, and a center of the calibration prism is taken as the calibration point; and

the measurement assembly is provided with a station pier, the station pier is provided with an automatic measuring total station and a station point, and the automatic measuring total station is adopted to measure a distance, a horizontal angle and a vertical angle between the station point and any one of the calibration points.

10. An automatic and accurate adjustment system for a prefabricated beam body formwork, comprising at least two automatic and accurate adjustment devices for the prefabricated beam body formwork according to claim 1, wherein the adjustment system further comprises:

a control management device, which is configured to preset theoretical three-dimensional coordinates of a calibration point of each of the adjustment devices and send the theoretical three-dimensional coordinates to the corresponding calculation control assembly;

a data management device, which is configured to collect and store measurement data and calculation data of each of the adjustment devices; and

a video monitoring device, which comprises a plurality of video monitoring assemblies in one-to-one correspondence with each of the adjustment devices, each of the video monitoring assemblies comprises a camera and a display, and the camera is configured to obtain a real-time image of the corresponding adjustment device and display the real-time image through the corresponding display.