BIOLOGICAL ANALYSIS SYSTEM AND METHODS

FIELD OF THE DISCLOSURE

[0001] The present disclosure relates broadly, but not exclusively, to biological analysis systems and related methods, including polymerase chain reaction (PCR) systems.

BACKGROUND

[0002] Biological analysis systems, such as PCR systems, are useful tools for conducting diagnostics and research in biological or biochemical samples. A PCR system typically has a thermal cycler that heats and cools the samples over a number of cycles to achieve the desired amplification of one or more target molecules. Real-time PCR systems, also known as qualitative PCR (qPCR) systems allow monitoring of a PCR assay during each thermal cycle of the process.

[0003] Generally, there is an increasing need to simplify the installation and setup of biological analysis systems so that operators can more quickly and efficiently use biological analysis systems for their intended purpose. However, existing systems typically require manual operation or intervention which may result in inefficiency and inconsistency.

[0004] Thus, it is desirable to provide a biological analysis system that can address at least one of the above problems.

SUMMARY

[0004a] According to an aspect of the present disclosure, there is provided a biological analysis system comprising: a sample block configured to hold a biological sample and a base configured to hold the sample block, the sample block comprising a first connector, and the base comprising a second connector; a first driver configured to drive the second connector; a cover disposed to cover the sample block and a cover carrier configured to hold the cover, the cover comprising a third connector, and the cover carrier comprising a fourth connector; a second driver configured to drive the cover carrier and fourth connector; and

a controller communicatively coupled to the first driver and to the second driver, the controller configured to: align the cover and/or the sample block to the cover carrier using the second driver; engage the third connector with the fourth connector using the second driver; engage the first connector with the second connector using the first driver; and secure and/or lock the sample block to the base using the first driver.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] Embodiments of the present disclosure will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

[0006] Figure 1 shows a block diagram that illustrates a PCR instrument upon which embodiments of the present teachings may be implemented.

CLAIMS

1. A biological analysis system comprising:

a sample block configured to hold a biological sample and a base configured to hold the sample block, the sample block comprising a first connector, and the base comprising a second connector;

a first driver configured to drive the second connector;

a cover disposed to cover the sample block and a cover carrier configured to hold the cover, the cover comprising a third connector, and the cover carrier comprising a fourth connector;

a second driver configured to drive the cover carrier and fourth connector; and

a controller communicatively coupled to the first driver and to the second driver, the controller configured to:

align the cover and/or the sample block to the cover carrier using the second driver;

engage the third connector with the fourth connector using the second driver;

engage the first connector with the second connector using the first driver; and

secure and/or lock the sample block to the base using the first driver.

2. The system as claimed in claim 1, wherein the connectors are electrical connectors configured to provide electrical power and/or communication between the system and the sample block and between the system and the cover.

3. The system as claimed in claims 1 or 2,

wherein the cover carrier further comprises a third driver, the controller being communicatively coupled to the third driver; and

wherein the controller is configured to secure and/or lock cover to the cover carrier using the third driver.

4. The system as claimed in claim 3, wherein the controller is configured to:

disengage the cover from the cover carrier using the third driver; and

disengage the third electrical connector from the fourth electrical connector using the second driver to separate the cover carrier from the cover.

5. The system as claimed in any one of claims 1-4, wherein the controller is configured to disengage the third electrical connector from the fourth electrical connector using the third driver by moving a linkage from a first position to release the cover from the cover carrier to a second position to separate the third electrical connector from the fourth electrical connector.

6. The system as claimed in any one of claims 1-5, wherein the cover is a heated cover.