**HARDWARE PACKAGE TO CONVERT THE EXISTING POWER SUPPLY FOR LIBRA SEISMIC STATIONS TO ARCHIVE AN HIGHER STABILITY**

The offered hardware package is based on the experience of the station visit at the seismic stations in Tangerang (TNG) and Sintang (STKI) which is described in detail in the document "Recommendation & Suggestions.pdf". This document can be inquired at info@esa-jasa.com.

The hardware package includes all parts necessary to convert the current Libra Power System to an higher stability refer to the power system which is an critical part of the Libra Seismic Stations. It is designed to be compatible with the already installed solar panels and batteries to avoid the purchase of extra solar panels and batteries.
Content of the hardware package to improve the Libra Power System:

- The package include the „3 solar Controller box“ to split the existing system into 3 parallel systems. Herewith the whole power system will be more stable and the equipment will still powered in case one of 3 parallel systems is broken.
- The „3 solar Controller box“ include the circuitry to decouple the parallel working power systems to make sure in case one of the parallel system is broken the other systems are not disturbed.
- The „3 solar Controller box“ include stainless steel spring press terminals. Those terminals create an safe contact to the cables. These kind of terminals are chosen to be able to adapt for changes which may occurring in the next years.
- The „3 solar Controller box“ includes temperature sensors in order to make the solar controllers able to compensate temperature differences from the batteries to the solar controller to adjust the loading voltage. This will archive an optimal charged battery which will have a higher capacity and longer lifetime.
- The „3 solar Controller box“ include an high pass filter circuitry at the output of the solar controllers to filter peaks that may produced by the PWM charging routine of the solar controllers. Those peaks can disturb or even destroy the Libra equipment.
- The „3 solar Controller box“ include an high quality Hensel box with a transparent cover to enable the local staff to check the control LEDs and the display of the solar controller. The box is extendable for further developments. The setup is made in an way avoiding humidity to enter it. This will extend the lifetime of the solar controllers and avoid corrosion at the terminals.
- The package include 96m solar cables for the cabling of the solar panels.
- The package include 20 piece MC4 solar connector for an proper connection.
- The package include 14 piece MC4 branch solar connectors to enable the field engineers to setup the solar panels in parallel.
- The package include an proper 30m long cable conduit to protect the buried solar cables.
- The package includes 2 set of battery cables.
- The package include the cabling for the grounding connection.
- The package include the grommets to the solar panels connection box.
- The package include an manual to give the local staff the knowledge to check the proper function of the system.