

AVN RADIO TELESCOPE CONVERSION SOFTWARE SYSTEMS

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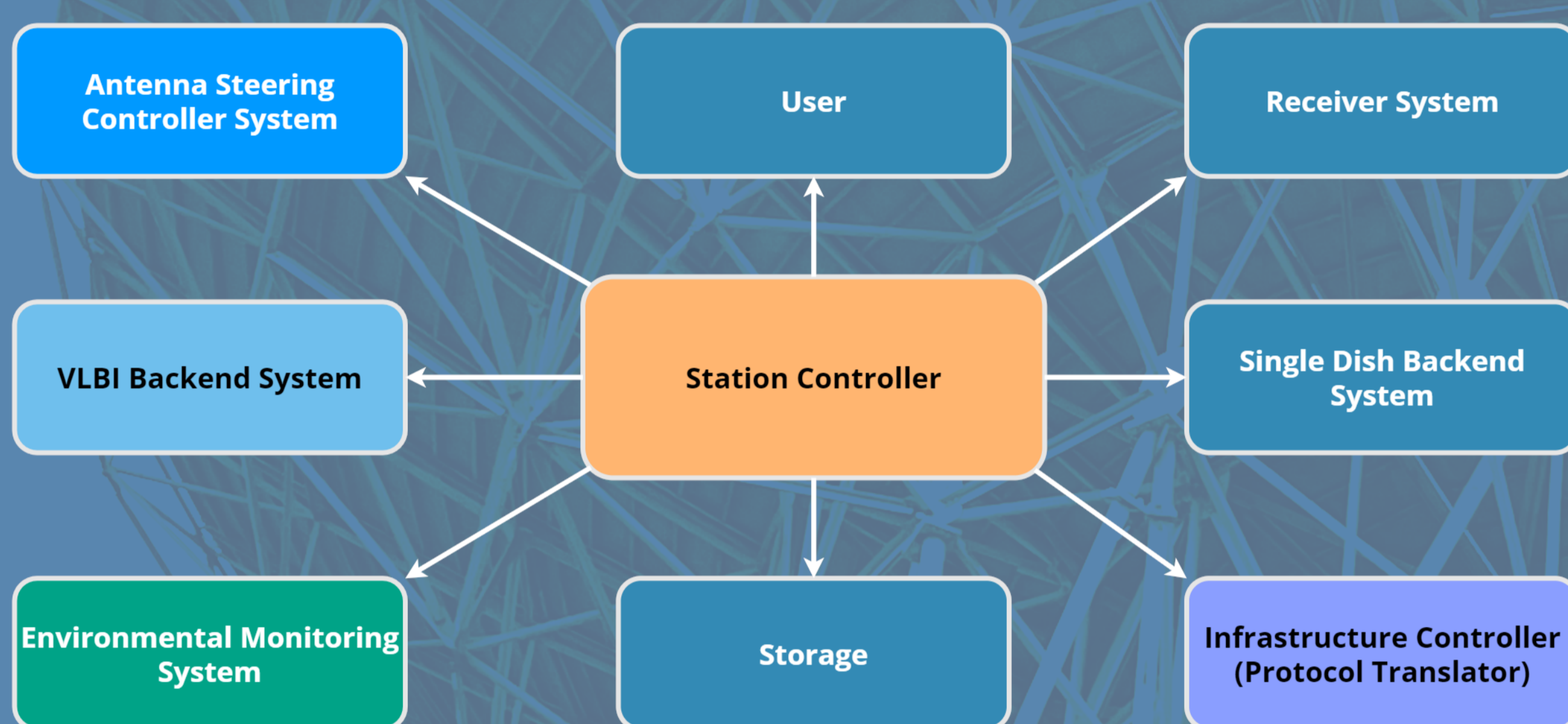
Overview

The African VLBI Network (AVN) is a proposed network of Radio Telescopes involving 8 partner countries across the African continent. The AVN project aims to convert redundant satellite data communications ground stations, where viable, to Radio Telescopes. One of the main objectives of AVN is human capital development in Science, Engineering, Technology and Mathematics (STEM) with regards to radio astronomy in SKA (Square Kilometer Array) African Partner countries.

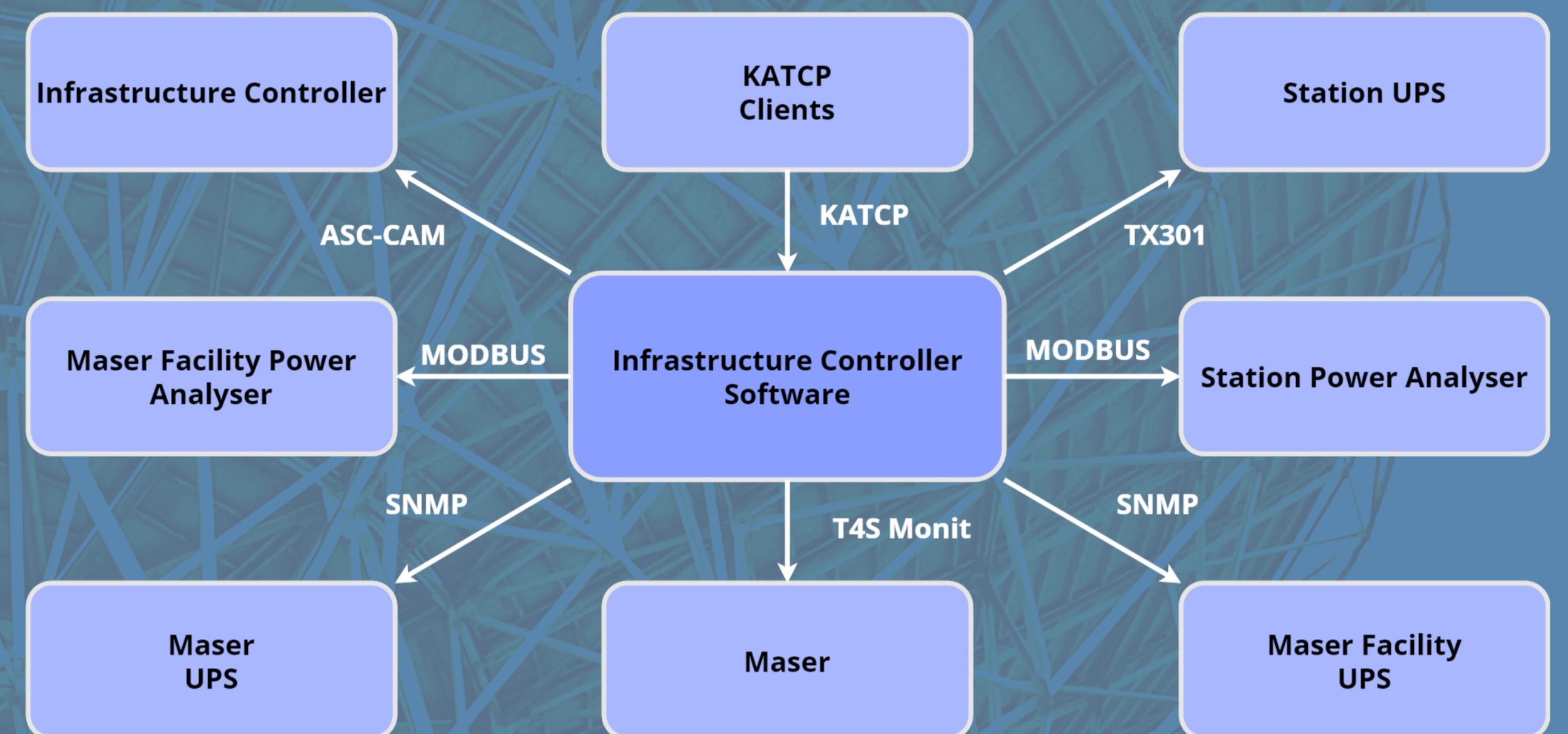
The Station Control and Monitoring (CAM) Software consists of the Station Controller Software, Protocol Translation Software, Environmental Monitoring System Software and the VLBI Backend Software (Field System Station Software).

The protocol that is used by Station CAM is Karoo Array Telescope Protocol (KATCP). Other industrial, proprietary or open protocols are converted by the Protocol Translation Software. Station CAM also interfaces with other supporting software subsystems such as the Receiver Software, Maser Building Control and Monitoring and the Single Dish Backend.

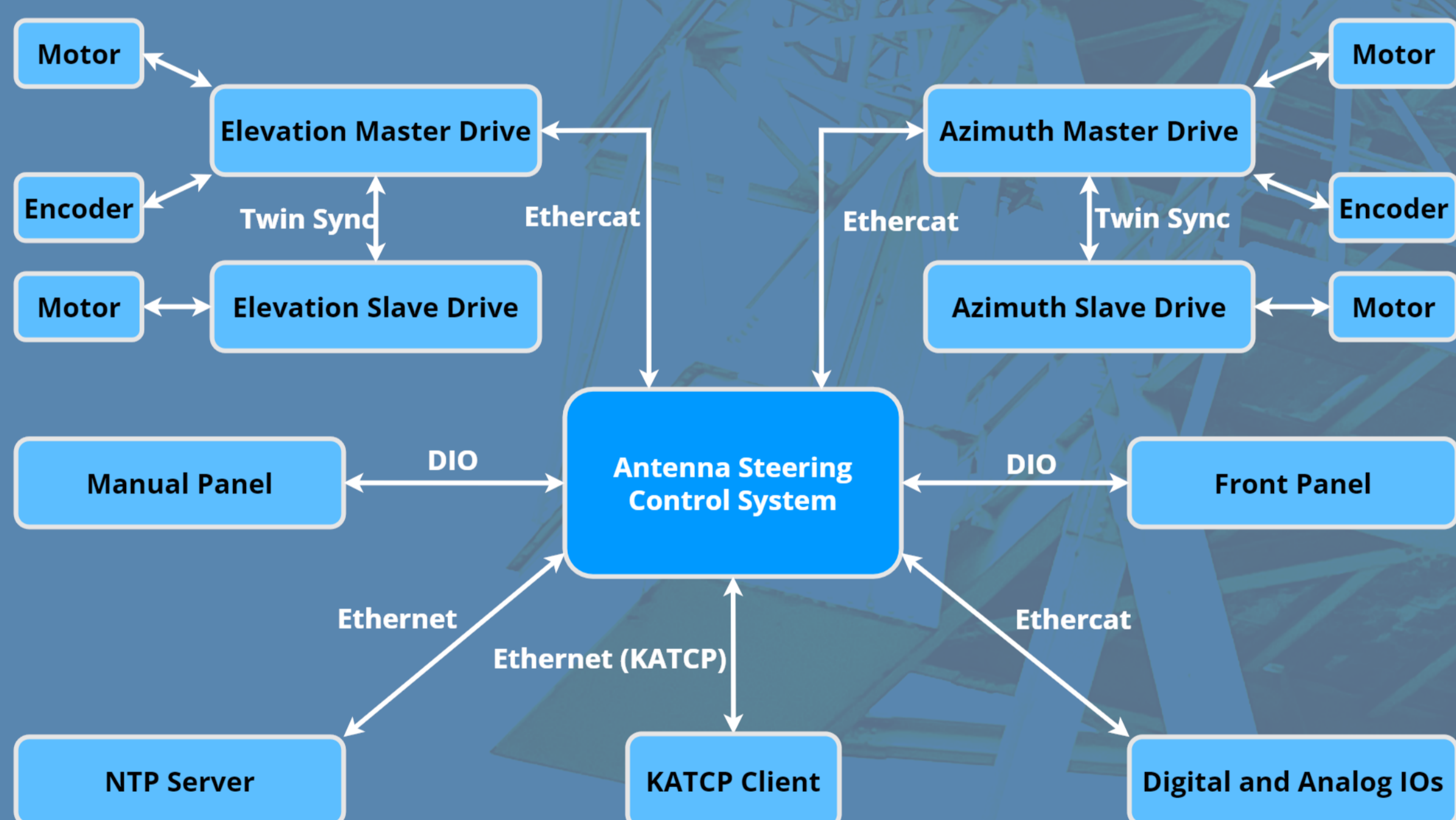
Station Controller Software



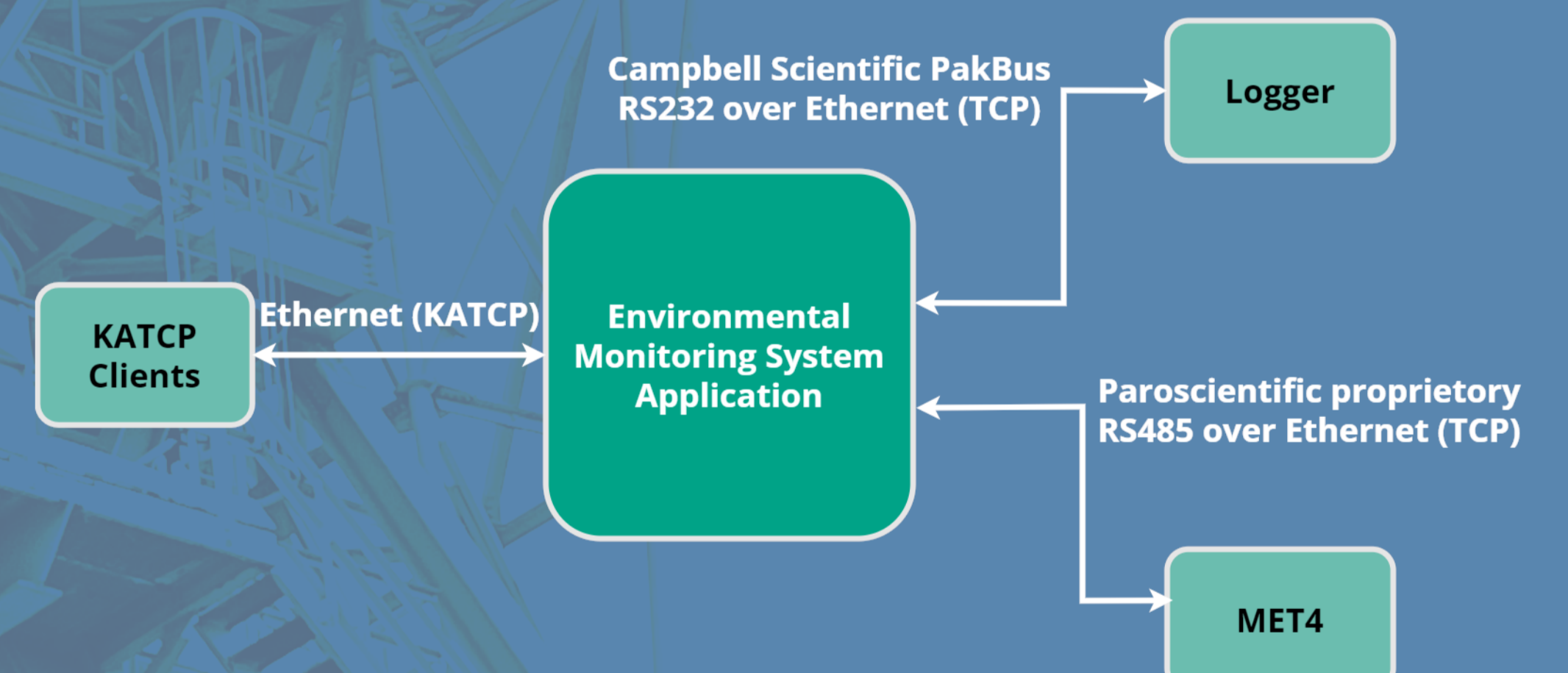
Infrastructure Controller



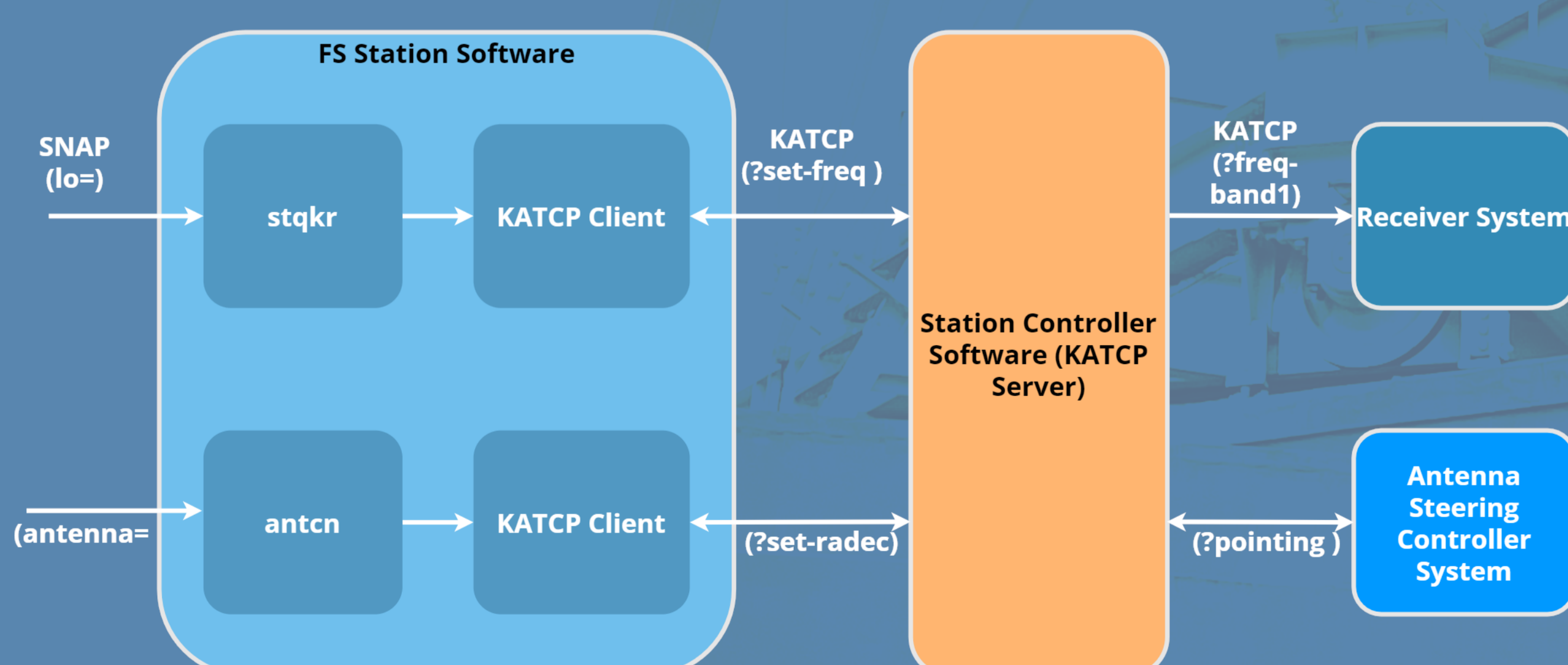
Antenna Steering Controller Software



Environmental Monitoring System Application



Field System Station Software



Technology Stack



Conclusion / Acknowledgement

In the conversion of the antenna from a telecommunication station to a radio telescope, we have successfully developed and use software components to control and monitor the telescope subsystems, thereby providing an additional VLBI resource for the global astronomy community in pursuit of scientific research.

The engineering phase of the project in Ghana is expected to be completed by the end of 2023.

We would like to express our gratitude to our Ghanaian colleagues for their invaluable assistance in making this conversion possible.