

Specifications

Item	Specifications
Number of elements	8 x N (N = Number of ADU)
Analog input bandwidth	Max 400MHz
ADC sampling frequency	100.352MHz
ADC quantization bits	12bit
FFT pre-processing	Polyphase Filter Bank
FFT size	8,192 or 4,096 ※Selectable by control command
FFT frequency resolution	FFT size 8,192 : 12.25KHz FFT size 4,096 : 24.5KHz
Number of beams	FFT size 8,192 : 4 beams FFT size 4,096 : 8 beams
Integration time	8ms
Output data	Power spectrum
Output format	Single-precision floating-point format (32bit)
Output protocol	VTP/VDIF/UDP/IP or custom protocol ※To be specified upon ordering
Control protocol	Attached Python script
Output / Control interface	Ethernet 10Gbit
Reference clock	10MHz Input BNC-jack (Only last-stage BFU is required)
Reference timing	1PPS Input BNC-jack (Only last-stage BFU is required)
Power input voltage	AC100-240V
Size	ADU : 220 x 150 x 90 mm BFU : EIA 1U depth 482mm ※Excluding Protrusions
Weight	ADU : typ 2Kg T.B.D. BFU : typ 11Kg

Notes

The products and services described in this document may be discontinued or specifications may be changed without prior notice.



<https://elecs.co.jp/en/>



DRS4 Series

Direct **RF** Sampler with Digital Signal Processing **4th** generation

Phased Array Antenna Backend System

A/D Converter Unit (ADU)



Front Side
Single Optical I/F



Rear Side
8ch Analog Inputs

Beamforming Unit (BFU)



1st-Stage BFU
12ch Optical I/F



2nd-Stage and later BFU
18ch Optical I/F

Features

- Scalable Phased Array Antenna System via cascaded ADUs and BFUs
- ADU : 100M sample/s 12bits 8inputs
- BFU : 8inputs with 4 or 8 independent beam outputs
- Fiber-optic links between ADUs and BFUs lower lightning hazard
- Reference signals (10 MHz, 1 PPS) are last-stage BFU-fed only

Elecs Industry Co.,Ltd.

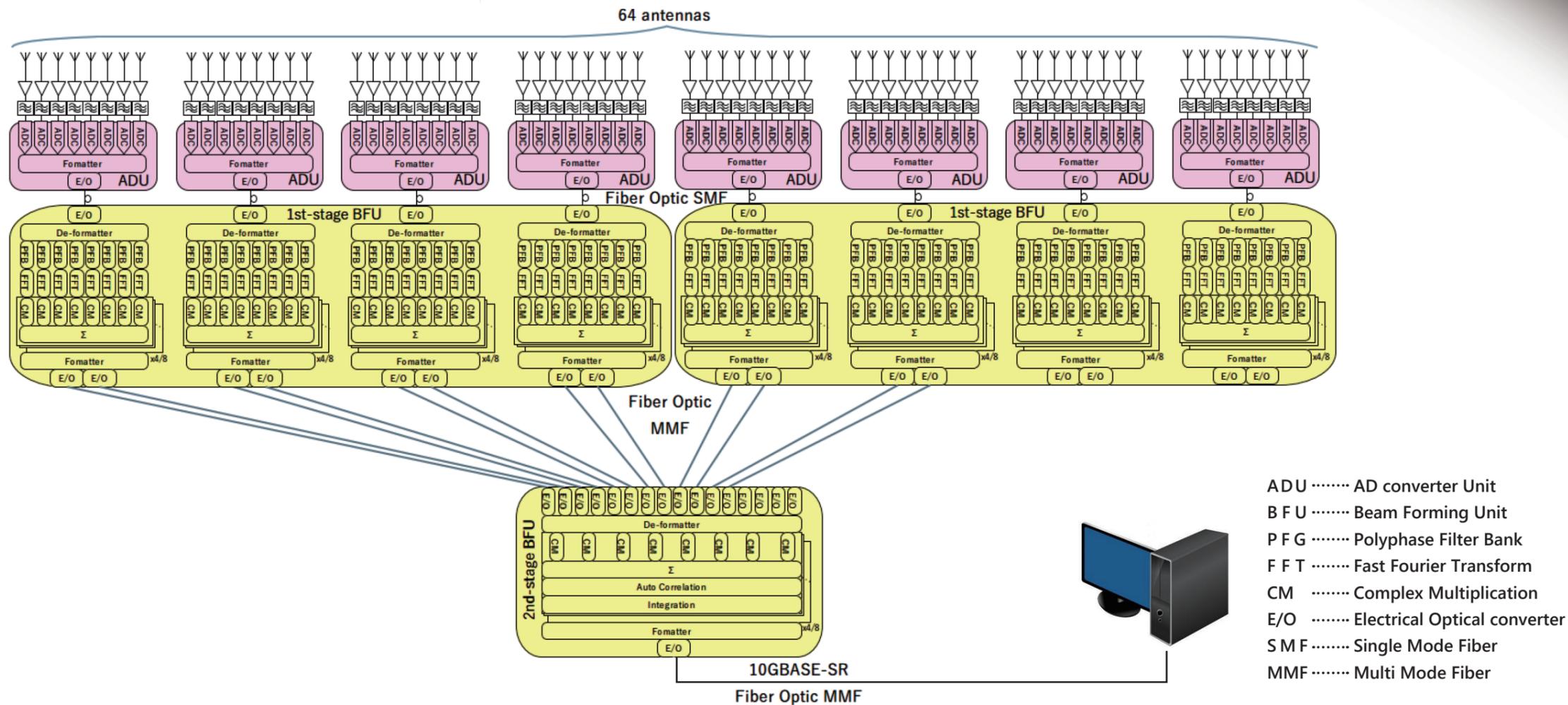
1-22-23, Shinsaku, Takatsu-ku, Kawasaki-shi,
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Block Diagram Configuration Example for 64 Analog Inputs(8 ADUs and 3 BFUs)



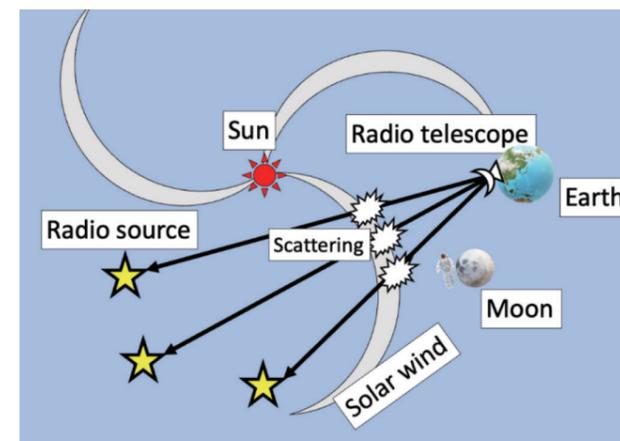
Case Study : Nagoya University Next-Generation Solar Wind Observation

Solving a Grand Challenge: This initiative aims to solve the Solar Wind Acceleration Problem, a fundamental mystery in stellar physics, by determining the source and mechanism of solar wind acceleration.

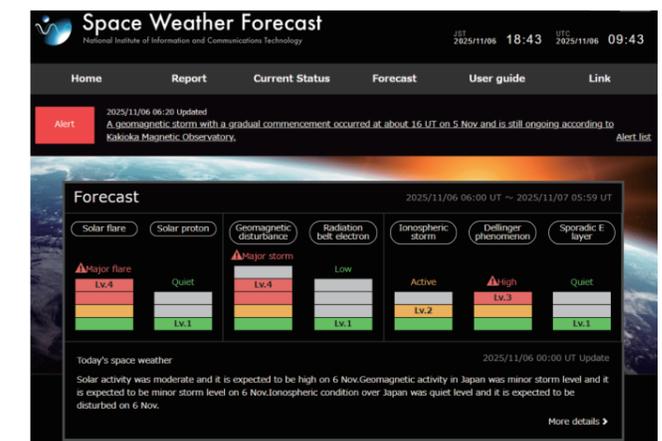
Technological Advantage: Leveraging the synergy of Interplanetary Scintillation (IPS) and a Phased Array Antenna system, the instrument delivers a tenfold increase in solar wind velocity data compared to existing facilities.

Scientific First: The unprecedented data volume enables the first-ever spatial resolution of solar wind sources on the Sun's surface.

Enhanced Space Weather Forecasting: The utilization of this high-resolution data will dramatically enhance the accuracy of heliospheric 3D simulations, enabling the advanced prediction of Earth-directed solar wind disturbances that pose a threat to critical infrastructure.



Conceptual diagram of solar wind approaching Earth, observed through radio waves
https://en.nagoya-u.ac.jp/news/articles/researchers_voice_047/



NICT's Space Weather Forecast Website
<https://swc.nict.go.jp/en/>