



Solutions for Sustainable Energy

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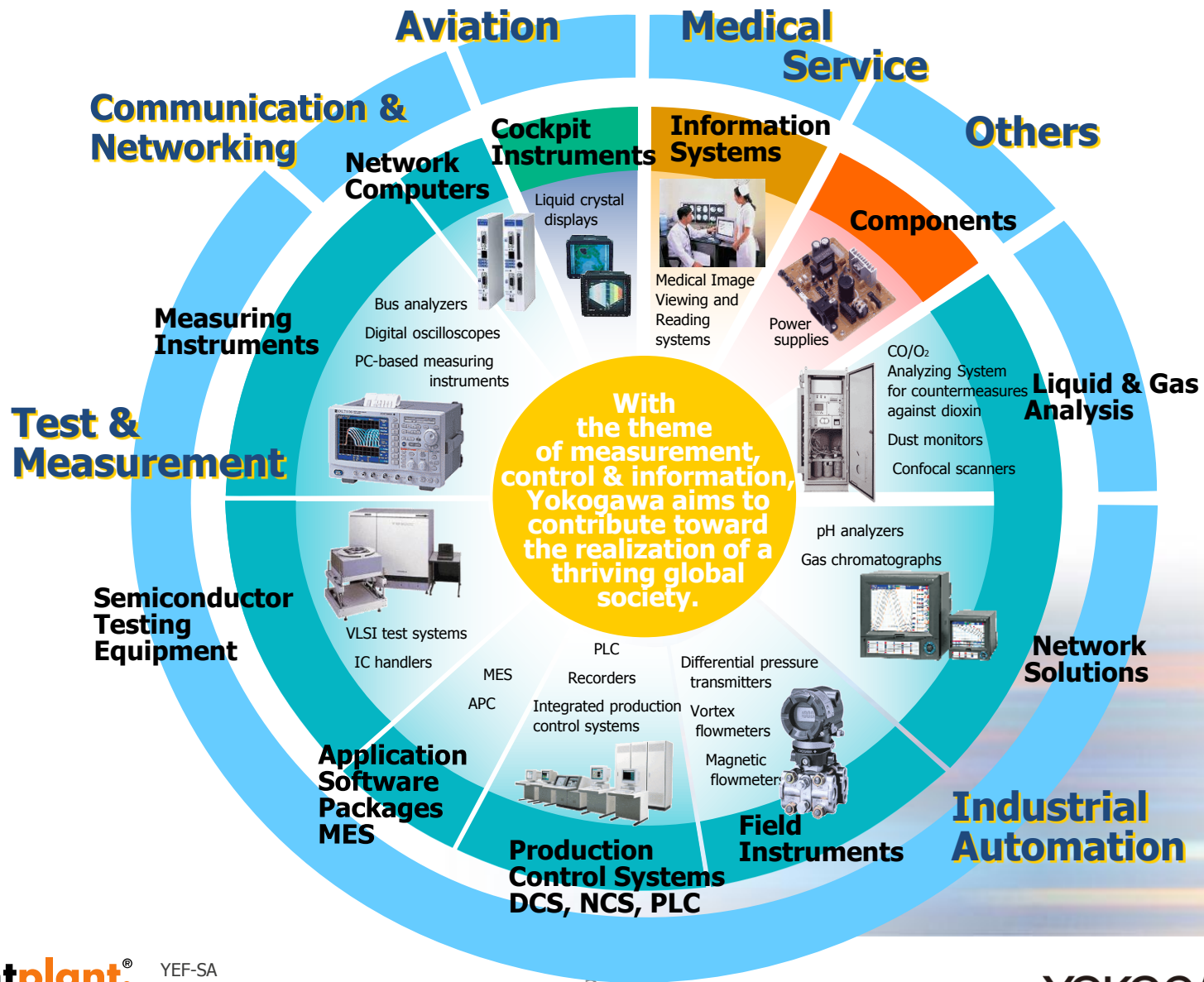


The acute angle and sharp straight edges of the top half of the diamond symbol represent Yokogawa's cutting-edge technology while the gentle curvature of the bottom half represents the warm-hearted nature of Yokogawa's people.

By balancing these two elements, Yokogawa aims to contribute toward the realization of a thriving global society in much the same way as the sun. This property is reflected in the bright yellow of the diamond.

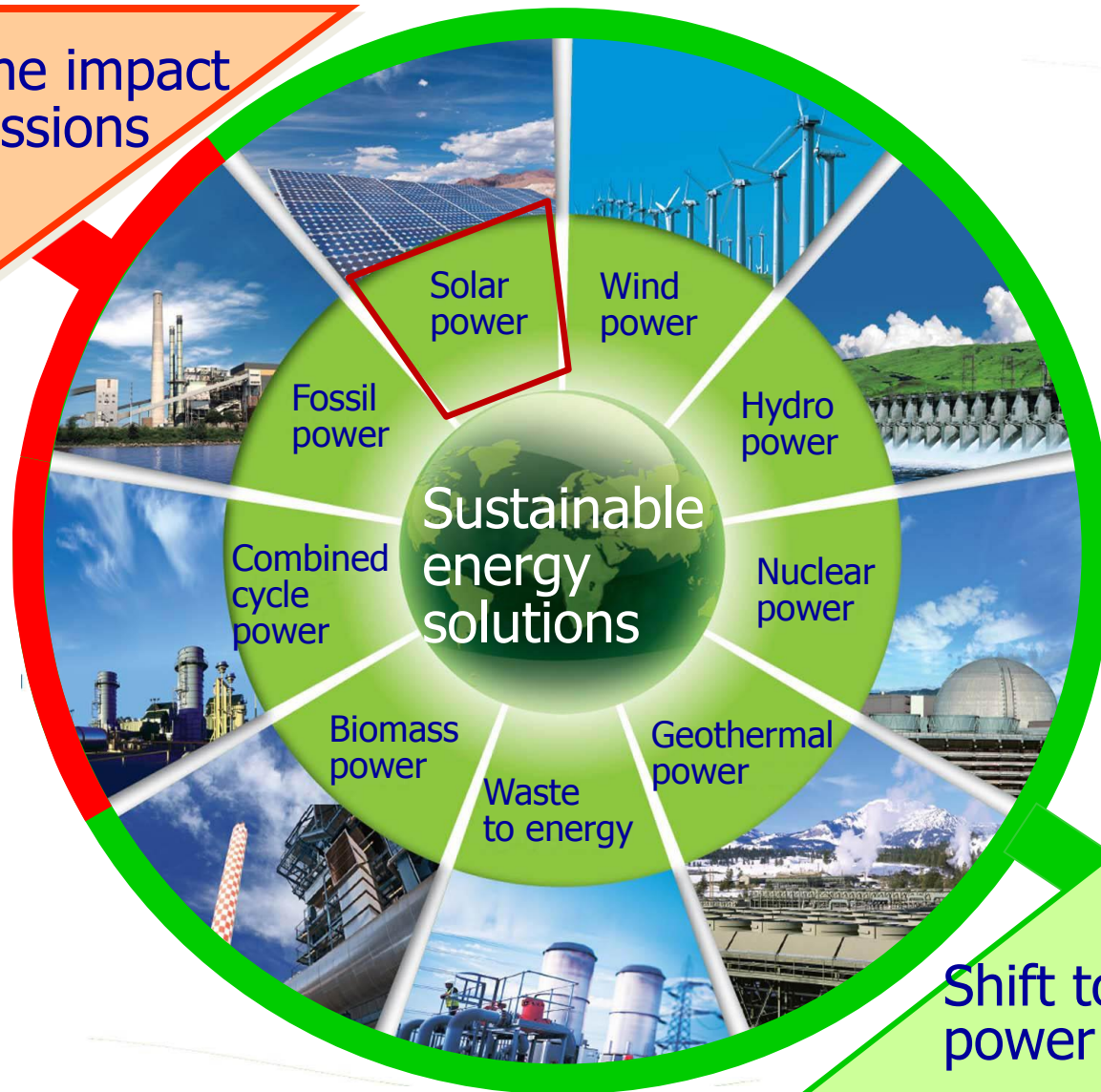
– Yokogawa trademark since October 1986

❖ The business domain



❖ Sustainable energy solutions

Minimize the impact of CO₂ emissions from fossil fuels



Shift to non-fossil power generation

❖ Example of application – mirror control

Yokogawa supplies Australian solar pioneer

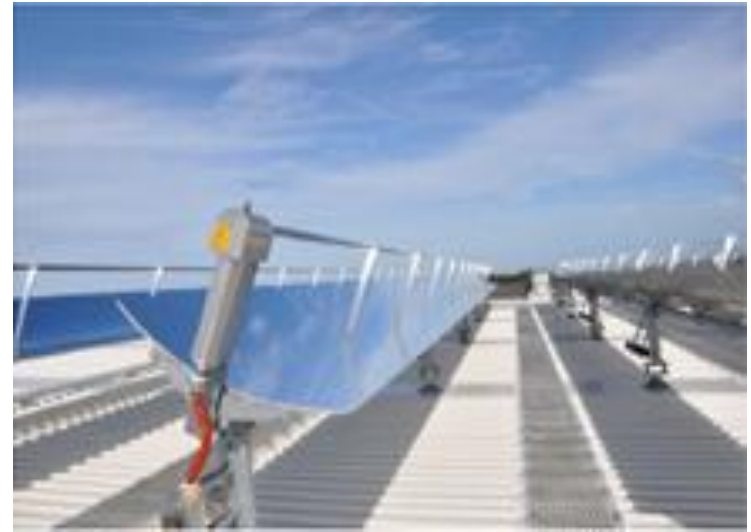
Yokogawa Australia has supplied its breakthrough HXS10 solar controller to NEP Solar - one of the pioneers of solar energy in Australia - for use in a solar cooling project.



NEP Solar of Warriewood on Sydney's northern beaches, grew out of companies that were involved in wind farm development but later became pioneers of novel solar applications such as the first solar cooling project in Australia in 2004.

❖ Project outline

One of NEP Solar's latest projects is a commercial installation of a solar field to drive a chiller for part of the GPT Charlestown Square shopping complex in the regional city of Newcastle north of Sydney.



The 345 square metre 'PolyTrough 1200' solar field is mounted on a rooftop above a cinema complex. The chiller uses the heat from the solar field and a concentrated salt solution in which water gets absorbed and re-absorbed, exchanging heat in the process.

❖ Precision at its best

A critical part of the efficiency of the concentrated solar system is the ability to very accurately track the sun and adjust the angle of the reflectors on two axes to capture the maximum incident solar rays.

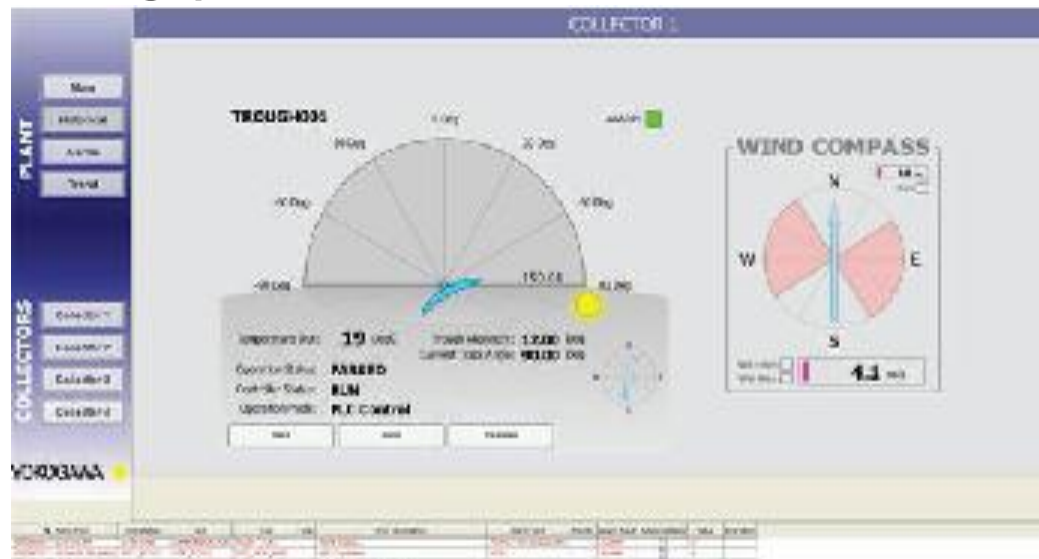


“Because we need to focus exactly on one point (the solar tube), the tracking needs to be very accurate. Yokogawa’s HXS10 solar controller makes this possible.”

❖ Further projects

To monitor the efficiency of the entire system, flow meters and temperature sensors such as those produced by Yokogawa can determine how much energy is being converted into thermal energy.

NEP Solar use the Yokogawa HXS10 and the related graphic interface on a desalination project in Spain and a dairy processing plant in Switzerland.



Precision – advanced equipment



Concentrated Solar Power

Photovoltaic Solar Power

SolStation™ HXS10 Application Specific Controller

Optimally-designed field controller based on robust measurement and control technologies.

The HXS10 combines the best of Yokogawa's measurement and control technologies. The measurement system is inherited from Yokogawa's recorders that are used in mission critical applications throughout the world; while the control engine comes from Yokogawa's highly reliable loop controllers that have been proven and refined for over 30 years.



Built-in Solar Position Algorithm

- Calculation of sunrise, sunset and solar culmination time
- Open loop/closed loop hybrid control

Excellent Environmental Performance

- Low power design (5W or less) and wide operating temperature range (-20 to 70°C) allow usage in a fanless box in the field

Flexible, Customizable Program

- A wealth of arithmetic functions (trigonometric functions, PID, comparator, alarm, filter, etc.), enabling flexible user-programming to meet versatile requirements

Built to Order

- Tailor-made hardware configurations, minimizing the cost for unnecessary input, output and communication ports

High Quality and Reliable Support

- Reliable, long-term plant operation assured by high-quality controllers with sophisticated self-diagnostics and Yokogawa's global support organization

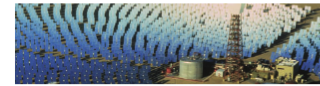


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www.yokogawa.com/ns/hxs/

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YOKOGAWA



Application Specific Controller **HXS10**

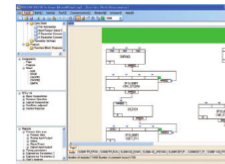


Specifications

Solar position algorithm (SPA): Built-in NREL* SPA algorithm
 Analog inputs: 0, 2, 4, or 8, Channel-to-channel isolated, universal inputs (TC, mV, V, and RTD)
 Analog outputs: 0 or 2, 0-20 or 4-20 mA
 Digital inputs: 12
 Digital outputs: 12
 Pulse counter inputs: 0 or 2 (encoders), encoder input available
 Control periods: 100ms (when using 2 or less analog inputs) or 250ms
 Measurement period: Synchronized to control period
 Programming functions: Arithmetic operations, trigonometric functions, PID, alarm, filter, delay, time/numerical value comparison, branching, resistor operation, etc.
 Communication: Ethernet x1, maintenance port x1, RS232 (option), RS485 (option)
 Power supply: 24 VDC
 Power consumption: 5 W or less
 Operating temperature range: -20 to 70°C
 Dimensions: 226 mm (W) x 132 mm (H) x 67 mm (D)
 Applicable standard: CE mark, C-Tick mark
 *National Renewable Energy Laboratory

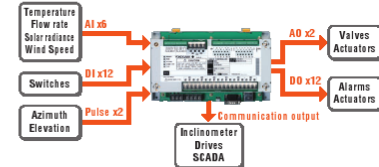
User Programming and Maintenance

- Programming tool for easy function creation.
- Batch download to multiple HXS10 controllers via Ethernet
- Individual setting and diagnostics via the maintenance port



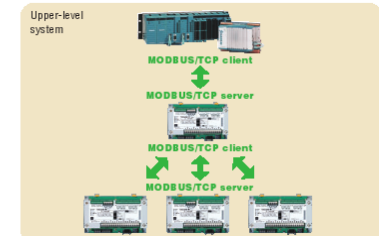
I/O Functions

Analog and digital I/Os, pulse counter input



Communication Function

The HXS10 peer to peer communication function reduces the communications load of higher-level systems.



Represented by:

For further inquiries on the HXS10
Please send e-mail to
HXS@cs.jp.yokogawa.com

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The clear path to operational excellence

SEE IT AS IT IS
KNOW IT AS IT SHOULD BE
ACT WITH INTEGRITY

VigilantPlant is Yokogawa's extension concept for safe, reliable, and profitable plant operations. VigilantPlant aims to enable an ongoing state of Operational Excellence where plant personnel are watchful and attentive, well-informed, and ready to take actions that optimize plant and business performance.

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Energy Saving Seminar

THANK YOU VERY MUCH
ご清聴ありがとうございました