



# Solutions for Sustainable Energy

**Manuel Fernandes,  
Business Development Manager  
Yokogawa South Africa**

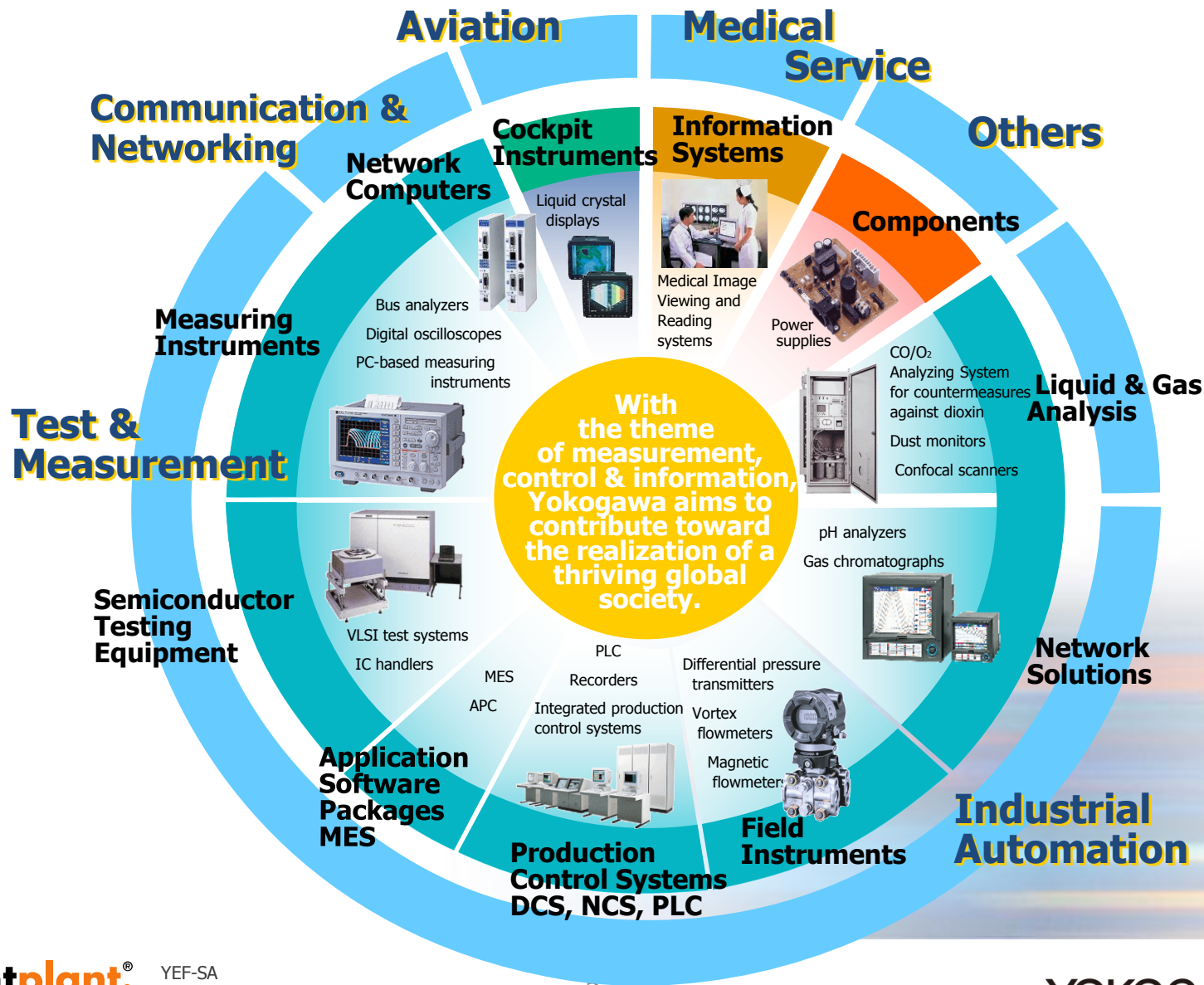


The acute angle and sharp straight edges of the top half of the diamond symbol represent Yokogawa's cutting-edge technology while the gentle curvature of the bottom half represents the warm-hearted nature of Yokogawa's people.

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.

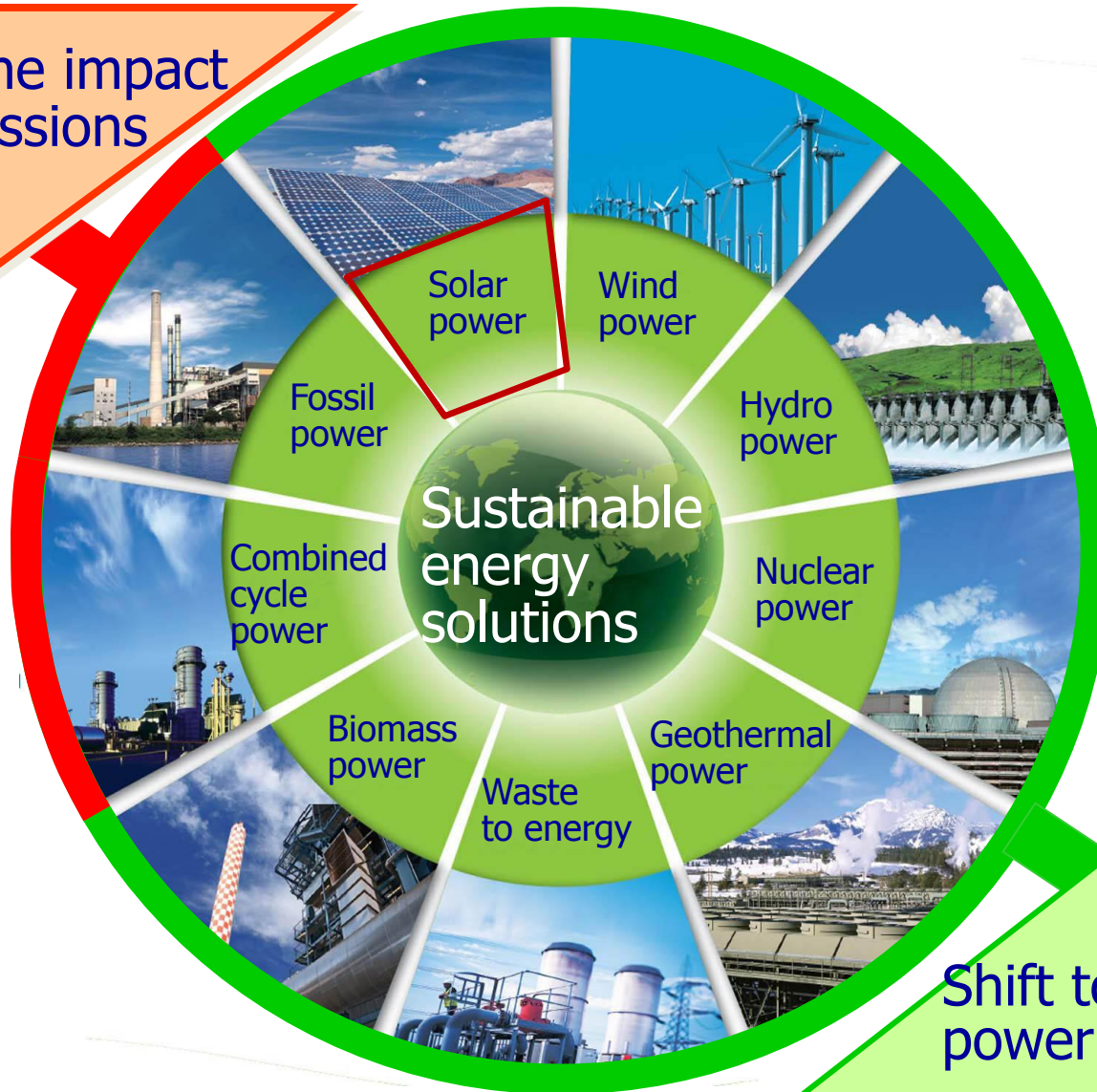
– Yokogawa trademark since October 1986

## ❖ The business domain



# ❖ Sustainable energy solutions

Minimize the impact of CO<sub>2</sub> emissions from fossil fuels



Shift to non-fossil power generation

# 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.

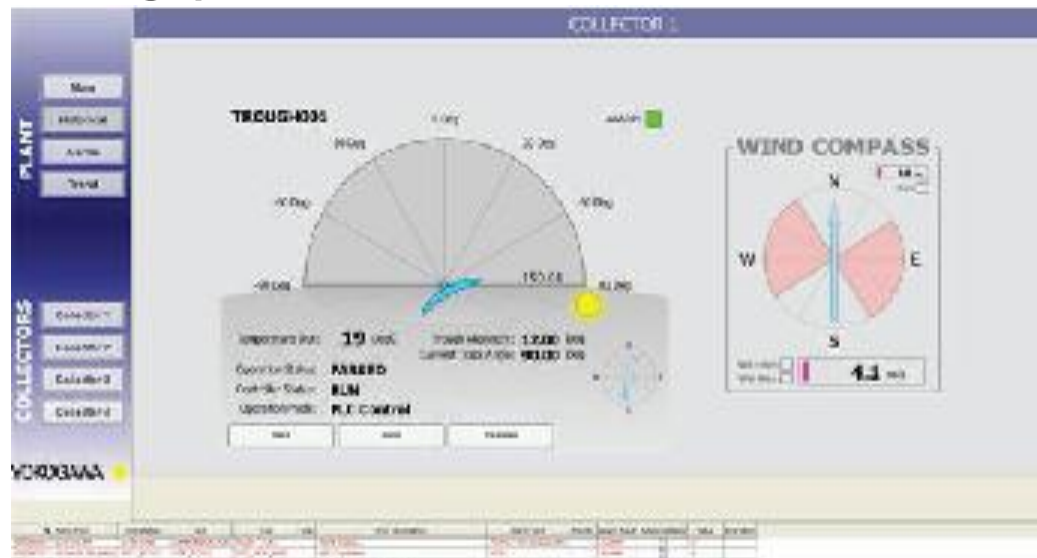


“Because we need to focus exactly on one point (the solar tube), the tracking needs to be very accurate. Yokogawa’s HXS10 solar controller makes this possible.”

## ❖ 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

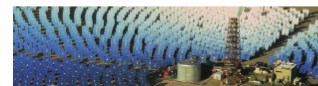


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[www.yokogawa.com/ns/hxs/](http://www.yokogawa.com/ns/hxs/)

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Application Specific Controller **HXS10**

### Specifications

Solar position algorithm (SPA): Built-in NREL SPA algorithm  
Analog inputs: 0, 2, 4, or 6, 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.

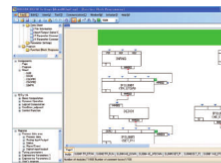
Communication: Ethernet x1, maintenance port x1, RS232 (option), RS485 (option)

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

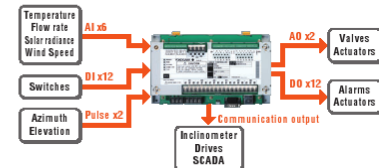
- Programming tool for easy function creation.
- Batch download to multiple HXS10 controllers via Ethernet
- Individual setting and diagnostics via the maintenance port



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

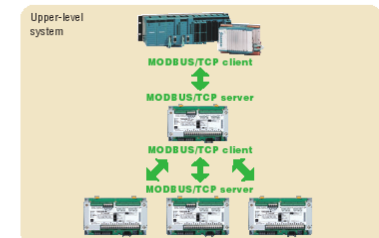
### I/O Functions

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.



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VigilantPlant is Yokogawa's automation 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.

YOKOGAWA ELECTRIC CORPORATION  
Network Solutions Business Div./Phone: (81)-422-52-7179, Fax: (81)-422-52-6619  
E-mail: ns@cs.jp.yokogawa.com  
YOKOGAWA CORPORATION OF AMERICA  
YOKOGAWA EUROPE B.V.  
YOKOGAWA ENGINEERING ASIA PTE. LTD.

Phone: 800-258-2552, Fax: (1)-770-254-0928  
Phone: (31)-88-4641000, Fax: (31)-88-4641111  
Phone: (65)-62419933, Fax: (65)-62412806

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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**