

Synchronization



Automation & Control
Excitation

Power Plant Management
Monitoring & Diagnosis

Protection

Synchronization

Turbine Controller

NEPTUN

Synchronization



6 x 140 MVA, Birecik, Turkey

Synchronizing with success

Paralleling of generators to power systems or one power system to another is a particularly tricky undertaking. At one time, it took a steady hand and full concentration, and this then set the pulse soaring. Nowadays, you can relax and perform this operation automatically using state-of-the-art, technically mature technology. Watch calmly as the needles move over your screen, all to the barely discernible sound of synchronization coming from the machine room. All data are logged, allowing you to analyze even the most complicated sequences afterwards in the office.

Safety

Everything must run perfectly during synchronization. What would you have done previously at zero beat? Were you able to measure the breaker closing time at each

periodic inspection? These demands can only be met with reliable, redundant, and rigorously tested technology. Our synchronization equipment combines your stringent reliability demands with our experience of over 40 years in this sector.

Convenience

What are your visions? Easy-to-learn screen visualizations, measurement of CB closing time, plotting of curves, LAN capability with Ethernet log to the other technological systems, operator control via PC/laptop as well as at the equipment itself? Do you want to simply forget about hex tables, operating manuals, painstaking calibrating, and testing?

That's the reason why we've made it all as easy for you as possible.



2 x 84 MVA, Chimay, Peru



5 x 16.7 MVA, 5 de Noviembre, El Salvador

Strategic products

SYN 3000

SYN 3000 features 5 synchronizing modes:

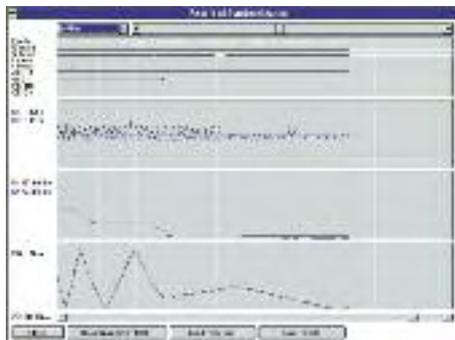
- generator to grid or supply line
- synchronous or asynchronous grids or supply lines
- synchronous or asynchronous systems or lines with dead bus or line de-energized systems
- synchro-check for manual connections
- synchro-check for high-speed busbar transfer

As a special function, the circuit breaker (CB) closing time can be measured and stored as a parameter. The basic design contains numerous internal safety functions (double voltage measuring circuits, fail-safe connections for the CB command outputs). To meet the highest of standards, a 2-channel unit can be used.

All operating modes, commands and constraints are shown by means of LEDs and a 4-line LC display. LAN communication is based on IEC 60870-5-104 (in preparation).

SYN-WIN

With the easy-to-use SYN-WIN software, synchronization processes are displayed on-line on a computer screen. The synchronizing process can be tracked on analog measuring instruments (double voltmeter, double frequency meter, and synchronoscope) overlaid on screen. The entire synchronizing process is logged automatically and can be displayed afterwards graphically for analysis and optimization purposes. This software allows the parameters of the SYN 3000 to be entered, modified and saved with password protection.



SICAM 1703 ACP

If the AI 6303 automation module from the SICAM 1703 ACP product line is used, the synchronization process can be integrated directly into the automation and control system.

With the direct transformer signal interface, there is no need for an additional interface level. As an integrated component, this synchronization tool has all the system properties of the SICAM 1703 ACP product line for project planning and visualization in addition to its own specific features.

Product range



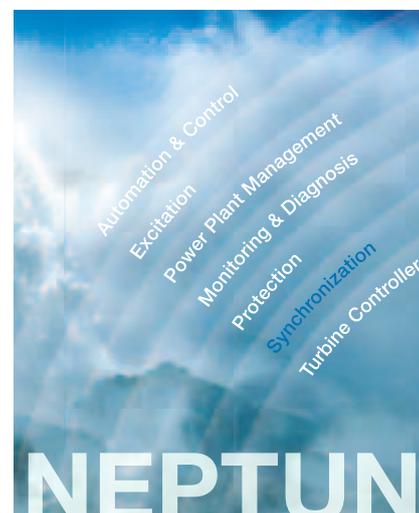
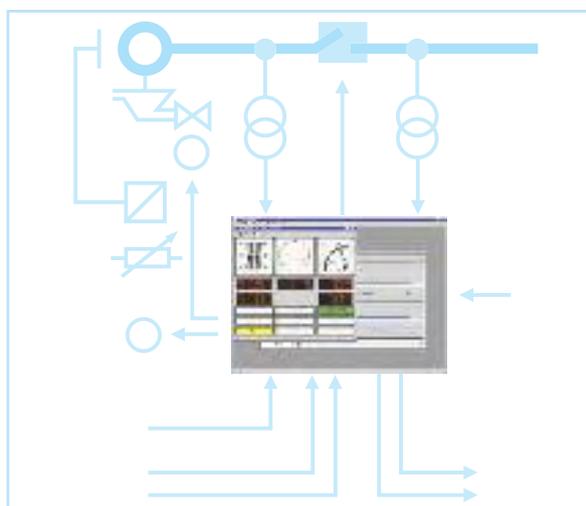
The comprehensive solution

SYN 3000 operating modes	Synchronizing a generator to a power system, supply line or busbars	Synchronizing two asynchronous systems			Paralleling of two asynchronous systems			Synchronism check and CB close interlock			Monitoring of high-speed busbar transfer
		Both systems energized	One system de-energized	One system de-energized	Both systems energized	One system de-energized	One system de-energized	Both systems energized	One system de-energized	Both systems de-energized	
Speed control	yes		no			no			manual		no
Voltage control	yes		no			no			manual		no
CB close command	single pulse*)		single pulse*)			single pulse*)			continuous*)		single pulse*)
Synchronization time monitoring	yes		yes			yes			yes		yes
Frequency comparison	yes	yes	no	no	yes	no	no	yes	no	no	yes
Voltage comparison	yes		yes			yes			yes		yes
Phase angle check	yes	yes	no	no	yes	no	no	yes	no	no	yes

Technical data SYN 3000

Voltage measuring Nominal voltage 100 VAC Voltage measuring range 0 - 150 VAC Nominal frequency 16.7, 50, 60 Hz, depending on completion Load impedance 1 VA	Measuring accuracy Voltage measuring 1 V Frequency measuring 0,005 Hz Setting ranges Selector inputs 2 oder 10, depending on type Difference frequency 0,01 - 0,25 Hz Voltage difference 1 - 30 VAC Permitted phase angle 0 - 15/45 deg. Residual voltage for de-energized power systems 0-20 VAC	Supply Voltage 90 - 260 VAC and DC Optional 20 - 56 VDC Power input 8 W Temperature range 0-50°C
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SYN 3000 in use





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