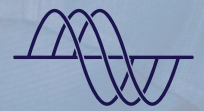


# SCADA SYSTEMS

SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEMS FOR UTILITY-SCALE PV SYSTEMS  
(INCLUDING POWER PLANT CONTROLLER)



**NOR-CAL CONTROLS**  
ENERGY SOLUTIONS

Your Project. Our Passion.

## OPEN ARCHITECTURE

Every SCADA solution is open architecture and can be compatible with most if not all accessible, off-the-shelf hardware and software components, allowing complete freedom to perform upgrades and maintenance throughout your systems life as you wish.

## LOCAL HUMAN MACHINE INTERFACE

Our local SCADA server comes installed with high performance HMI software programmed with custom tailored graphical screens, enabling operators' total visibility and control over all site inverters and devices. Includes real-time and historical alarm viewer.

## LOCAL HISTORIAN

Our local historian server comes installed with software that enables operators and project stakeholders to report on historical trends, and query raw and calculated data at 1 second time stamps. Our on-site historian software can also generate reports.

## AUTOMATIC ALARM NOTIFICATION

Automatic through SMS and email for all Nor-Cal SCADA monitored devices. Alarm recipients and escalation schemes can be configured based on alarm priority.

## FULL CONTROL TO MEET ANY PPA, UTILITY & OWNER REQUIREMENTS

Nor-Cal's turnkey SCADA systems include a Power Plant Controller, which enables site-wide substation and individual inverter and device level control, meeting all controls functionality requirements per project specifications.

Our standard control implementation includes but its not limited to: MW Curtailment, Automatic Voltage Response (AVR), Power Factor/VAR Control, Droop (frequency response), CAP bank control.



NOR-CAL'S  
SCADA SYSTEMS  
ARE ALL **OPEN-  
ARCHITECTURE**  
(OPEN SOURCE).

## SEAMLESS 3RD PARTY INTEGRATION

Integrate with third-party off-takers, including Utility entities and O&M providers, utilizing our built-in OPC, Modbus, and DNP3 device communication protocols.

## FULLY CUSTOMIZABLE

Each SCADA solution is tailored to meet project and application requirements using industry best practices.



[www.norcalcontrols.net](http://www.norcalcontrols.net)



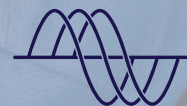
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## COMMUNICATION

LAN	RJ45 10/100 Ethernet, full half duplex, auto polarity, Gigabit (optional)
CELLULAR (OPTIONAL)	4G LTE
NETWORKING	DHCP or Static IP, Layer 2 support, Layer 3 (optional)
PROTOCOLS	Modbus TCP, Modbus RTU (RS-232/485), OPC-UA, DNP3 and more

## COMPLIANCE

CAN/CSA-C22.2 NO. 14 LISTED INDUSTRIAL CONTROL PANEL

UL LISTED 508A LISTED INDUSTRIAL CONTROL PANEL

## PHYSICAL (INDOOR SCADA RACK ENCLOSURE)

RACK UNITS (RU)	42
ENCLOSURE RATING	NEMA 12
DIMENSIONS	24" L x 43" W x 78.5" H

## PHYSICAL (OUTDOOR SCADA RACK ENCLOSURE)

RACK UNITS (RU)	42
ENCLOSURE RATING	NEMA 12
DIMENSIONS	34" L x 24" W x 78" H
HHVAC	4000 BTU (standard; other options available)

## PHYSICAL (INVERTER SKID NETWORK CLOSURE)

ENCLOSURE RATING	NEMA 4
DIMENSIONS	24" L x 24" W x 10" H
ENVIRONMENT	-30°C TO 60°C, 95% RH (non-condensing)

## COMPONENTS

### SCADA RACK ENCLOSURE

- SCADA server
- Historian server
- Power Plant Controller (PPC)
- BOP equipment data concentrator/protocol converter
- Firewall
- Substation equipment data concentrator/controller
- Root switch
- UPS power supply
- External battery backup

### INVERTER SKID NETWORK ENCLOSURE

- I/O (optional)
- Fiber/ethernet network switch
- Media converter (optional)
- Cell modem
- Power supply (optional UPS)



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