MONITORING AND CONTROL UNIT

Smartpack 2 Controller

Smartpack just got smarter

- New and improved interface
- New and improved functionality
- Improved statistics
- Full hybrid support

Distributed control system for medium to large power systems.

NEW FEATURES AND LOOK ON A WELL-TESTED CONTROL PLATFORM

Smartpack2 is built on the proven software platform that is used in Smartpack, making it reliable and robust. Increased program memory and new hardware allows for more features and improved user interface. The new modular distributed control system simplifies connections.

Smartpack2 comes with advanced software to control power systems with multiple power sources. It handles solar energy and generators in combination with unstable grid. Smartpack2 is also prepared for wind power. It can be configured to automatically choose the smartest energy source at all times, and it can log the amount of energy produced by the various sources.

APPLICATIONS

Minimize fuel consumption for off grid sites.
Sites that run only on power from a generator often keep it running at a low load where most generators have low efficiency. Adding cyclic batteries and a Smartpack2 controlled power system, the Smartpack2 will run the generator in cyclic operation at its maximum efficiency. This will typically give a 55% reduction in fuel consumption. The total OPEX will be further decreased as the generator service will be less frequent due to it not running 24hours a day.

SIMPLIFIES OPERATION IN LARGE MULTISITE SYSTEMS

Smartpack2 offers many offsite benefits if it is connected to the internet. View the system status, change parameters and receive alarms at a multisite management center.

Use features such as battery lifetime estimations, fuel consumption through tank level measurement and generator runtime, to plan for site service. Use the energy logs to document the amount of renewable energy used, and to plan for site upgrades.

KEY FEATURES

SMARTPACK2 ON-SITE – DISPLAY AND MENUS FOR EASY ACCESS TO STATUS AND COMPLETE CONFIGURATION.

NO PC TO HOOK ON TO THE CONTROLLER – NO PROBLEM!

- Key system status parameters displayed by default: alarms, battery voltage, rectifier current and load current.
- Single key-hit to display list of triggered alarms.
- All configurations and setup available from the menus.
- High resolution and contrast – excellent reading and able to show complex content.
- Multilanguage (changeable “on the fly”): English, Chinese Simp., Chinese Trad., Russian, Norwegian and pending languages: Finish, French, German, Greek, Italian, Polish, Portuguese, Spanish, Swedish and Turkish.
- Disable external alarms while servicing.
- Access control – pin code to change configuration

SETUP DATA AND LOGS – BRING YOUR SD CARD.

- Convenient storage – for backup and transportation.
- Easy and robust to roll out a set of systems with
- Identical setup.

Screen	Graphical TFT high contrast, high resolution color display for easy navigation in user menu
LEDs for local visual alarms	(Major, Minor, Power ON)
Ethernet	for remote or local monitoring and control via WEB Browser Ethernet port with HP Auto MDI/MDI-X for detection and correction for straight-through and crossover cables.
SNMP protocol	with TRAP, SET and GET on Ethernet. Email of TRAP alarms
6 programmable relay outputs	for “traditional” remote monitoring. Expandable with I/O Monitor CAN Nodes.
6 programmable multipurpose inputs	(“digital inputs” or analog signals). Expandable with I/O Monitor CANNodes.
Comprehensive logging	
Backup of critical control features in Basic unit.	
Automatic battery monitoring and test	
Battery lifetime indication	
Battery used and remaining capacity (Ah or %)	
Monitoring	
User defined alarm grouping (boolean logic for grouped alarms)	
Uploading and Downloading of configuration files with SD Card or PowerSuite (Windows™ application).	

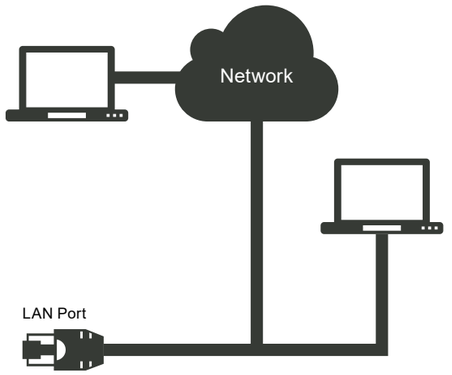
OUTPUT DATA

Event log: scroll through all events to get a quick overview of system history

System configuration: all parameters are editable from the menu

Main menu: easy task oriented layout and self explanatory navigation.

Smartpack2 Master



SD Card Reader for firmware upgrades, complete setup storage and restore, and storage of logs.

CAN BUS FOR POWER AND INTERNAL COMMUNICATION

CONTROL FEATURES

CONTROL SYSTEM

- Output Voltage Measurement
- Load Current Calculation
- Energy Calculation
- Load/Battery Disconnect
- Real Time Clock with Battery Backup
- Stored Site Text/ID and Messages
- Position (long/lat) for auto placement
- Test of Relay Outputs
- Alarm grouping of events for relay outputs

BATTERY

- Battery Current Measurement
- Battery Temperature Measurement
- Battery Testing (acc. to discharge table or set time limit)
- Setup of Battery Data/Table
- Battery Capacity Indication
- Battery Boost Charging
  -Auto – Ah discharge or voltage threshold
  -Interval or Manual
- Temperature Compensated Charging
- Charge Current Limitation
- Battery Low Voltage Disconnect
  -Temperature dependent (optional)
  -Mains independent (optional)

RECTIFIER

- Available information about each rectifier, e.g. serial number, version, internal temperature
- Individual Rectifier Current Measurement
- Individual Rectifier Input Voltage
- Efficiency Management
- Emergency Voltage
- Startup delay
- Detailed internal alarms summary

GENERATOR

- On/Off control for cyclic charging and fuel reduction
- Start-up delay of power system
- Fuel consumption logging and alarming based on tank level measurement
- Discharge cycle counter/Generator run hour logging
- DoD [%] logging w/time stamp

ALARMS/EVENTS AVAILABLE

Alarms can be set up with monitoring of minor and major levels. Hysteresis and time delay is user configurable.
All average and peak levels on analogue values are auto logged in Event log

POWER & CONTROL SYSTEM

- AC Mains Low (2-level)
- AC Phase Voltage x3 (2-level)
- “Digital” Inputs (programmable descriptions)
- Events trigger by inputs

Service mode (block relays), Generator running, Lower charge current limit, Battery test, Boost inhibit, Emergency low voltage , Clear manual reset alarms.

LOAD

- Load Disconnect
  -Voltage or Timer (from mains failure) based
  -Mains independent (optional)
- Load Fuse
- Load Current

BATTERY

- Battery Voltage (4-level, optional 8-level)
- Battery Temperature (2-level)
- Battery Used Capacity (2-level) [Ah or %]
- Battery Remaining Capacity (2-level) [Ah or %]
- Battery Fuse
- Symmetry Failure (2-level)
  -Only with BM Can Node
- Battery Quality after test (2-level)
- Battery Current (4-level)
- Battery Life Time (2-level) [from temperature log]

RECTIFIER

- Rectifier Failure (2-level)
- Rectifier Capacity (2-level)
- Rectifier Current (2-level)
- Rectifier Avg. Temperature (2-level)
- Rectifier Current Share (2-level)

SPECIFICATIONS - MASTER

Power Consumption	Max 4.5W
MTBF	> 1 300 000 hours Telcordia SR-332 Issue I, method III (a)($T_{ambient}$: 25°C)
Display	32k colour TFT – QVGA (320x240)
Ethernet Port	10/100 BASE-T / HP Auto MDI/MDI-X
Removable media	SD Card
SNMP	v1, v2c, v3 (pending) GET, SET & TRAP
Web	Webpower; XHTML 1, java script, SSL
Networking	SMTP Client and NTP Client.
Event log	10 500 time stamped events
Data log	10 000 time stamped values of 10 user defined monitoring points
Dimensions (WxHxD)	156 x 72 x 38mm 6,4 x 3 x 1,6”

SPECIFICATIONS - BASIC

Input Voltage	20-172 VDC (20 -75 VDC***) Shutdown: < 18 VDC
Power Consumption	Max 1.5A Max 4.5A (3x LVD max loaded)
Contactor Outputs	3 x LVD control outputs
Configurable Inputs	3x NO/NC/Temperature: NTC probe
System Connections Voltage Sense Current Sense Battery Fuse* Load Fuse*	 24V, 48V, 60V & 110V** systems 0-20mV and 0-60mV range shunts Battery fuse sense, Open/Closed Load fuse sense, Open/Closed, Pull- Up/Down, Diode Matrix
Ground fault	Simple bridge circuit detection
Max Basic nodes	8 units on a single CAN-bus
Dimensions (WxHxD)	155 x 35 x 80mm 6.4 x 1.4 x 3.3”

SPECIFICATIONS – I/O MONITOR (TYPE 2)

Configurable Inputs	6x NO/NC/Analog Voltage [0-75V]
Alarm Outputs	6x Relay–Dry/Form C [Max 75V/2A/60W]
Max I/O Monitors	14 units on a single CAN-bus
Power Consumption	Max 3.6W
Dimensions (WxHxD)	135.1 x 23.5 x 59mm 5.3 x 0.9 x 2.3”

GENERAL SPECIFICATIONS – ALL UNITS

Temperature Range	-40 to +65°C (-40 to 140°F)

DESIGN STANDARDS

Electrical safety	UL 60950-1, EN 60950-1, CSA 22.2
EMC	ETSI EN 300 386 V.1.3.2 EN 61000-6-1 / -2 / -3 / -4 / -5
Mains Harmonics	EN 61000-3-2
Environment	ETSI EN 300 019: 2-1 (Class 1.2), 2-2 (Class 2.3) & 2-3 (Class 3.2) ETSI EN 300 132-2 2011/65/EU (RoHS) & 2008/98/EC (WEEE)
Marine compliance (EMC class B with AC filter)	ABS (PENDING) DNV-OS-D202, Ch.2 Sec. 4 (DNV 2.4) o Temperature Cl. A o Vibration Cl. A o Humidity Cl. A o Enclosure Cl. A

OPTIONAL CONTROL DEVICES / CANNODES

Part No.	Description
242100.300	Battery Monitor
242100.301	Load Monitor
242100.304	I/O Monitor (Outdoor)
242100.306	I/O Monitor Type 3
242100.200	Smartnode RS232/485
242100.500M	Smartpack2 Master
242100.501M	Smartpack2 Basic
242100.601M	Industrial Basic
242100.502	I/O Monitor – Type 2

*Only Open/Closed for 110V **Basic ver. U1.3 ***Basic ver. 1.0 - 1.2