insight technical services, inc.

Product Specification Sheet

BATTERY-Pack™

Features

- **Based on 32 Bit SCADAPack32™ PLC.**
- **Designed for Tank Batteries needing control and alarming.**
- **Interfaces with Starter-Pack for Wellhead Control.**
- **Local Pump Control.**
- **Water Measurement.**
- **Class 1 Div 2 Hazardous Area Rating.**
- **Operator Configurable Alarm Setpoints.**
- **Operator Configurable Shutdown Setpoints.**
- **PLC Programming experience not needed to Setup.**
- **Environmental Specification from -40 to 158 degrees.**
- **3 Year Warranty on SCADAPack32 PLC.**
- **3 RS-232, 1 RS-232/485, 1 Ethernet port.**
- **Modbus Communications Ready.**
- **SCADA Screens Available for Wonderware and CygNet.**

The Insight Technical Services, Inc. (**itsi**) Battery-Pack is a Tank Battery Monitoring, Alarming, and Control package that can be applied to virtually any Tank Battery configuration. The Battery-Pack is designed for small wellhead Tank Batteries, or larger Central Tank Batteries where multiple wells are piped to one location. The Battery-Pack provides an Operator Control and Monitoring platform for controlling local pumps, as well as controlling remote Wellhead pumping units and submersible pumps.

The Battery-Pack was designed by **itsi** using the Control Microsystems, Inc. SCADAPack32® PLC as our foundation. Starting with the SCADAPack32® PLC, we have added our custom programming, and packaged the Battery-Pack to be an off-the-shelf solution for your wellhead automation needs.

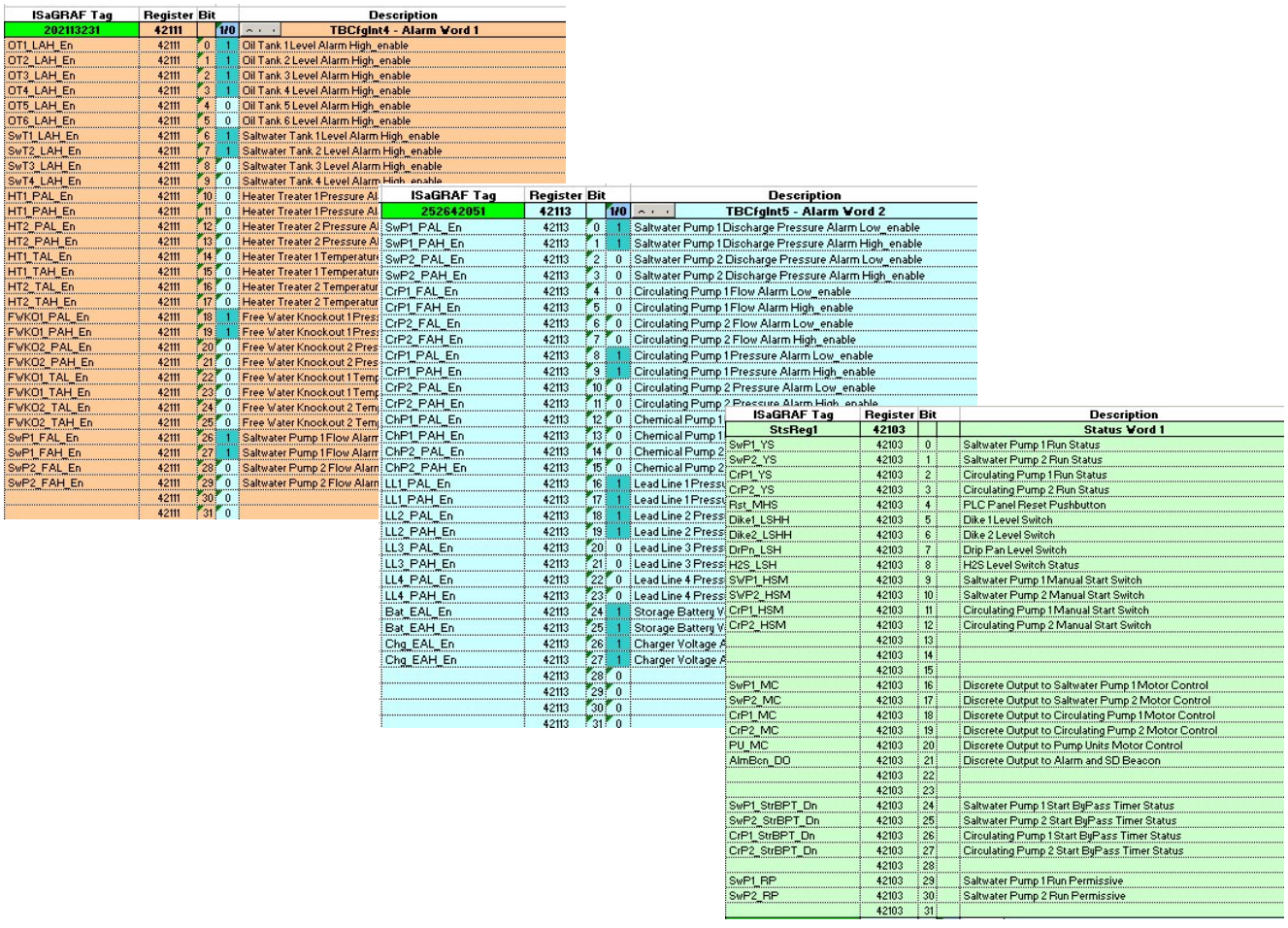
The base Battery-Pack is equipped with 8 analog inputs, 2 Analog Outputs, 16 Digital Inputs, and 12 Digital Outputs. The base unit includes a full feature Cimrex Control Display, for local Operator interfacing. It also includes on front buttons for Start, Stop, and RESET pushbuttons, as well as an Emergency Shutdown (ESD) button. The Battery-Pack can be expanded as needed to fit any wellhead automation application.

Since the Battery-Pack uses the SCADAPack32® processor, it has the ability to do flow measurement if needed at a Tank Battery location. There is support for up to 10 meter runs.

Battery-Pack Setup

The Initial PLC Setup determines the makeup of the Battery-Pack Panel. A table is provided that defines the I/O of a Battery-Pack as it is initially configured. This table is then used by the PLC to setup the proper program configuration for each distinct wellhead application.

By using the setup table it is not necessary for each Battery-Pack to be programmed by a PLC programmer. Instead a simple configuration routine can setup the Battery-Pack panel and ready it for operation. What does this mean to you? Consistency of field devices within your field. One program can handle many different wellhead automation functions. Ease of installation and setup, adding up to an overall cost savings.



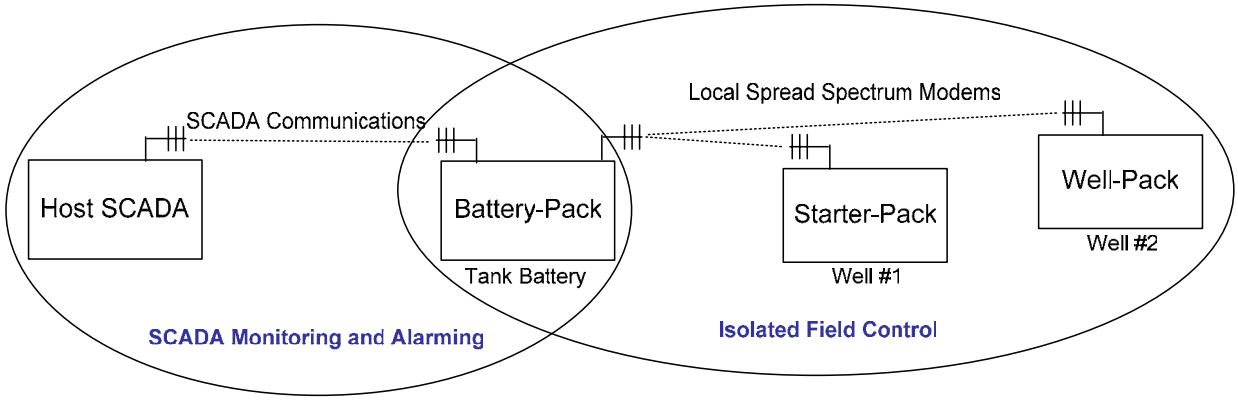
ISaGRAF Tag	Register	Bit		Description
202113231	42111		1/0	TBCfgInt4 - Alarm Word 1
OT1_LAH_En	42111	0	1	Oil Tank 1 Level Alarm High_enable
OT2_LAH_En	42111	1	1	Oil Tank 2 Level Alarm High_enable
OT3_LAH_En	42111	2	1	Oil Tank 3 Level Alarm High_enable
OT4_LAH_En	42111	3	1	Oil Tank 4 Level Alarm High_enable
OT5_LAH_En	42111	4	0	Oil Tank 5 Level Alarm High_enable
OT6_LAH_En	42111	5	0	Oil Tank 6 Level Alarm High_enable
SwT1_LAH_En	42111	6	1	Saltwater Tank 1 Level Alarm High_enable
SwT2_LAH_En	42111	7	1	Saltwater Tank 2 Level Alarm High_enable
SwT3_LAH_En	42111	8	0	Saltwater Tank 3 Level Alarm High_enable
SwT4_LAH_En	42111	9	0	Saltwater Tank 4 Level Alarm High_enable
HT1_PAL_En	42111	10	0	Heater Treater 1 Pressure Al
HT1_PAH_En	42111	11	0	Heater Treater 1 Pressure Al
HT2_PAL_En	42111	12	0	Heater Treater 2 Pressure Al
HT2_PAH_En	42111	13	0	Heater Treater 2 Pressure Al
HT1_TAL_En	42111	14	0	Heater Treater 1 Temperatur
HT1_TAH_En	42111	15	0	Heater Treater 1 Temperatur
HT2_TAL_En	42111	16	0	Heater Treater 2 Temperatur
HT2_TAH_En	42111	17	0	Heater Treater 2 Temperatur
FWKO1_PAL_En	42111	18	1	Free Water Knockout 1 Press
FWKO1_PAH_En	42111	19	1	Free Water Knockout 1 Press
FWKO2_PAL_En	42111	20	0	Free Water Knockout 2 Pres
FWKO2_PAH_En	42111	21	0	Free Water Knockout 2 Pres
FWKO1_TAL_En	42111	22	0	Free Water Knockout 1 Temp
FWKO1_TAH_En	42111	23	0	Free Water Knockout 1 Temp
FWKO2_TAL_En	42111	24	0	Free Water Knockout 2 Tem
FWKO2_TAH_En	42111	25	0	Free Water Knockout 2 Tem
SwP1_FAL_En	42111	26	1	Saltwater Pump 1 Flow Alarm
SwP1_FAH_En	42111	27	1	Saltwater Pump 1 Flow Alarm
SwP2_FAL_En	42111	28	0	Saltwater Pump 2 Flow Alarm
SwP2_FAH_En	42111	29	0	Saltwater Pump 2 Flow Alarm
	42111	30	0	
	42111	31	0	

ISaGRAF Tag	Register	Bit		Description
252642051	42113		1/0	TBCfgInt5 - Alarm Word 2
SwP1_PAL_En	42113	0	1	Saltwater Pump 1 Discharge Pressure Alarm Low_enable
SwP1_PAH_En	42113	1	1	Saltwater Pump 1 Discharge Pressure Alarm High_enable
SwP2_PAL_En	42113	2	0	Saltwater Pump 2 Discharge Pressure Alarm Low_enable
SwP2_PAH_En	42113	3	0	Saltwater Pump 2 Discharge Pressure Alarm High_enable
CrP1_FAL_En	42113	4	0	Circulating Pump 1 Flow Alarm Low_enable
CrP1_FAH_En	42113	5	0	Circulating Pump 1 Flow Alarm High_enable
CrP2_FAL_En	42113	6	0	Circulating Pump 2 Flow Alarm Low_enable
CrP2_FAH_En	42113	7	0	Circulating Pump 2 Flow Alarm High_enable
CrP1_PAL_En	42113	8	1	Circulating Pump 1 Pressure Alarm Low_enable
CrP1_PAH_En	42113	9	1	Circulating Pump 1 Pressure Alarm High_enable
CrP2_PAL_En	42113	10	0	Circulating Pump 2 Pressure Alarm Low_enable
CrP2_PAH_En	42113	11	0	Circulating Pump 2 Pressure Alarm High_enable
ChP1_PAL_En	42113	12	0	Chemical Pump 1
ChP1_PAH_En	42113	13	0	Chemical Pump 1
ChP2_PAL_En	42113	14	0	Chemical Pump 2
ChP2_PAH_En	42113	15	0	Chemical Pump 2
LL1_PAL_En	42113	16	1	Lead Line 1 Pressu
LL1_PAH_En	42113	17	1	Lead Line 1 Pressu
LL2_PAL_En	42113	18	1	Lead Line 2 Press
LL2_PAH_En	42113	19	1	Lead Line 2 Press
LL3_PAL_En	42113	20	0	Lead Line 3 Press
LL3_PAH_En	42113	21	0	Lead Line 3 Press
LL4_PAL_En	42113	22	0	Lead Line 4 Press
LL4_PAH_En	42113	23	0	Lead Line 4 Press
Bat_EAL_En	42113	24	1	Storage Battery V
Bat_EAH_En	42113	25	1	Storage Battery V
Chg_EAL_En	42113	26	1	Charger Voltage A
Chg_EAH_En	42113	27	1	Charger Voltage A
	42113	28	0	
	42113	29	0	
	42113	30	0	
	42113	31	0	

ISaGRAF Tag	Register	Bit		Description
StsReg1	42103			Status Word 1
SwP1_YS	42103	0		Saltwater Pump 1 Run Status
SwP2_YS	42103	1		Saltwater Pump 2 Run Status
CrP1_YS	42103	2		Circulating Pump 1 Run Status
CrP2_YS	42103	3		Circulating Pump 2 Run Status
Rst_MHS	42103	4		PLC Panel Reset Pushbutton
Dike1_LSHH	42103	5		Dike 1 Level Switch
Dike2_LSHH	42103	6		Dike 2 Level Switch
DrPn_LSH	42103	7		Drip Pan Level Switch
H2S_LSH	42103	8		H2S Level Switch Status
SWP1_HSM	42103	9		Saltwater Pump 1 Manual Start Switch
SWP2_HSM	42103	10		Saltwater Pump 2 Manual Start Switch
CrP1_HSM	42103	11		Circulating Pump 1 Manual Start Switch
CrP2_HSM	42103	12		Circulating Pump 2 Manual Start Switch
	42103	13		
	42103	14		
	42103	15		
SwP1_MC	42103	16		Discrete Output to Saltwater Pump 1 Motor Control
SwP2_MC	42103	17		Discrete Output to Saltwater Pump 2 Motor Control
CrP1_MC	42103	18		Discrete Output to Circulating Pump 1 Motor Control
CrP2_MC	42103	19		Discrete Output to Circulating Pump 2 Motor Control
PU_MC	42103	20		Discrete Output to Pump Units Motor Control
AlmBcn_DO	42103	21		Discrete Output to Alarm and SD Beacon
	42103	22		
	42103	23		
SwP1_StrBPT_Dn	42103	24		Saltwater Pump 1 Start ByPass Timer Status
SwP2_StrBPT_Dn	42103	25		Saltwater Pump 2 Start ByPass Timer Status
CrP1_StrBPT_Dn	42103	26		Circulating Pump 1 Start ByPass Timer Status
CrP2_StrBPT_Dn	42103	27		Circulating Pump 2 Start ByPass Timer Status
	42103	28		
SwP1_RP	42103	29		Saltwater Pump 1 Run Permissive
SwP2_RP	42103	30		Saltwater Pump 2 Run Permissive
	42103	31		

Battery-Pack Features

The Battery-Pack is designed to work with the Well-Pack and Starter-Pack by providing control data from the Battery-Pack to either the Well-Pack or the Starter-Pack. Using low power Spread-Spectrum modems the Battery-Pack continually communicates to the Wellhead location. If any alarm condition is detected at the Tank Battery, the Battery-Pack initiates commands to the Well-Pack or Starter-Pack and tells any well associated with that Tank Battery to shut-in. At this time it also communicates this system to the Host SCADA system so that Field Operators can respond and correct the problem, and get the wells producing as soon as is possible.



Battery-Pack I/O

The Battery-Pack is user configurable to conform to the setup of any Tank Battery Facility, large or small. Below are some of the typical Battery-Pack I/O points. These are the physical inputs and can vary as needed to support any Tank Battery installation.

Battery-Pack Inputs

42001	Oil Tank #1 Level
42003	Oil Tank #2 Level
42005	Oil Tank #3 Level
42007	Oil Tank #4 Level
42009	Oil Tank #5 Level
42011	Oil Tank #6 Level
42013	Saltwater Production Tank Level
42015	Saltwater Reserve Tank Level
42017	Saltwater Tank #3 Level
42019	Saltwater Tank #4 Level
42021	Heater Treater #1 Pressure
42023	Heater Treater #2 Pressure
42025	Heater Treater #1 Temperature
42027	Heater Treater #2 Temperature
42029	Free Water Knockout #1 Pressure
42031	Free Water Knockout #2 Pressure
42033	Free Water Knockout #1 Temperature
42035	Free Water Knockout #2 Temperature
42037	Saltwater Pump #1 Flowrate
42039	Saltwater Pump #2 Flowrate
42041	Saltwater Pump #1 Discharge Pressure
42043	Saltwater Pump #2 Discharge Pressure
42045	Circulating Pump #1 Flowrate
42047	Circulating Pump #2 Flowrate
42049	Circulating Pump #1 Pressure
42051	Circulating Pump #2 Pressure
42053	Chemical Pump #1 Pressure
42055	Chemical Pump #2 Pressure
42057	Lead Line 1 Pressure
42059	Lead Line 2 Pressure
42061	Lead Line 3 Pressure
42063	Unused
42065	Lead Line 4 Pressure
42067	Storage Battery Voltage
42069	Charger Voltage
42071	Ambient Temperature

Specifications

Battery-Pack Specifications

Tank Battery Automation	Oil, Gas, Coalbed Methane, Water
Alarms	Operator Configurable Alarm Setpoints
Shutdowns	Operator Configurable Shutdown Setpoints
Remote Wellhead Control	Can interface to Starter-Pack and Well-Pack units for Wellhead Control
Flow Measurement	Can do Custody Transfer Gas Measurement for up to 10 Meter Runs
Setup	No PLC Experience needed to install and setup unit
Documentation	Schematics and Wiring Instructions Included with each unit
SCADA Enabled	Pre-Configured SCADA Screens available for Wonderware and CygNet
Expandable	Battery-Pack can be expanded as needed
Communications	Modbus Ready, 3 RS232, 1 RS232/485 Configurable, 1 Ethernet Port
Enclosure	NEMA 4X Hoffman Enclosure
Panel Wiring	Ready Wired for Field Installation. Field Connections Isolated from Internal wiring.
Terminals	Weidmuller Terminals and Fuse Blocks used internally.

SCADAPack32 Controller

Processor	32 Bit CMOS 120 MHz clock
Memory	8Mb SDRAM, 4MB Flash , 1Mb CMOS RAM
Battery Backup	Lithium Battery retains contents for 2 years with no power
Analog Inputs	8 Analog Inputs (base), expandable to 64
Analog Outputs	4 Analog Outputs
Digital Inputs	16 Digital Inputs (base), expandable to 128
Digital Outputs	8 Digital Outputs (base), expandable to 32
Communication Ports	3 RS232, 1 RS232/485 Configurable, 1 Ethernet Port Standard
Baud Rates	Configurable from 300 to 115,200 Baud.
Power	11-30 VDC
Electrical Rating	Class 1 Div 2 Hazardous Area Rating
Environment	Rated for -40 to 158 degrees Fahrenheit

Cimrex Control Display

Display Size	4 Line by 20 Character Display
Display Type	Liquid Crystal Diode (LCD)
Function Keys	5 Programmable Function Keys
Protocol Support	Modbus RTU
Backlight Life	50,000 Hours

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