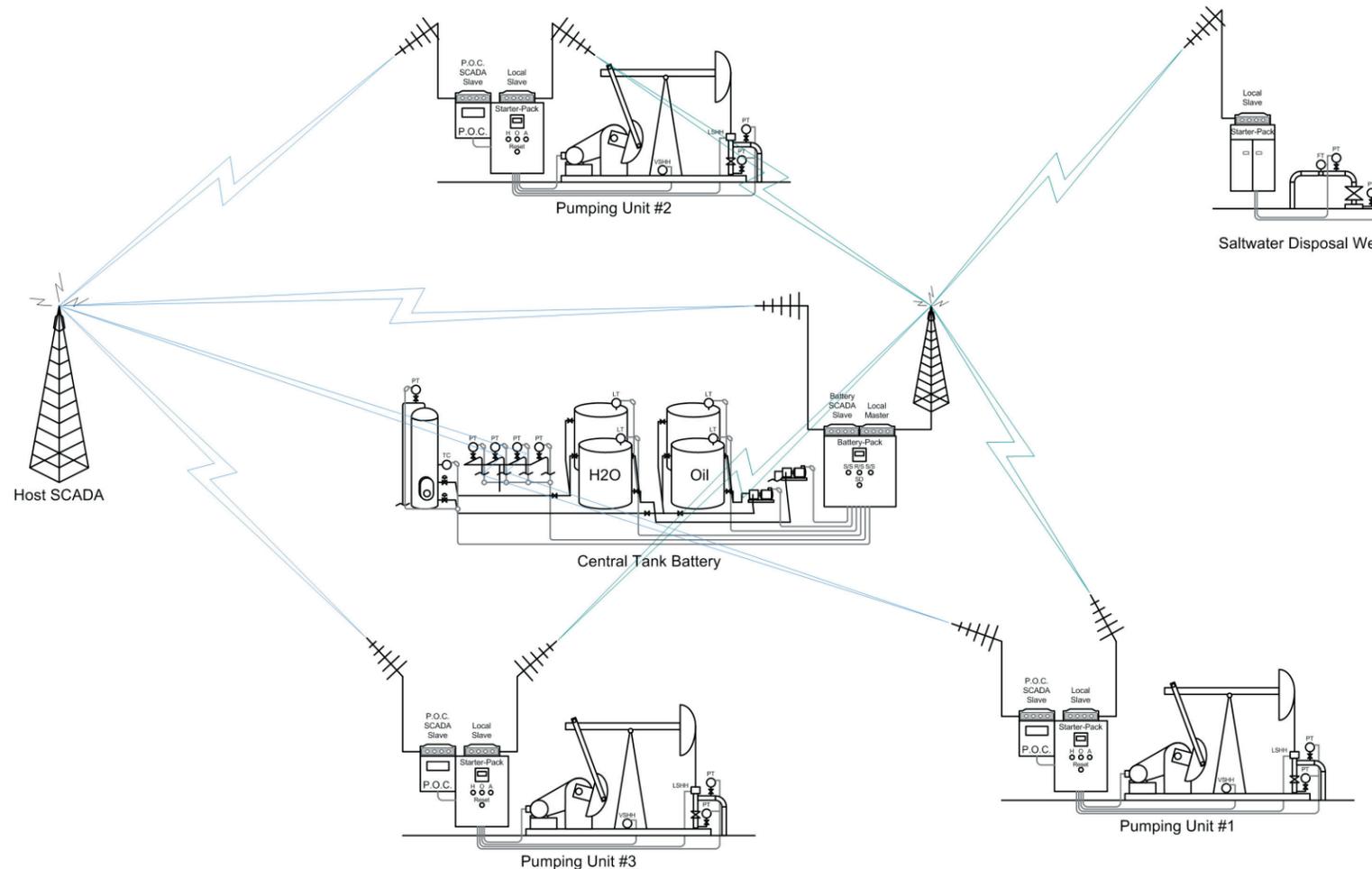The Insight Technical Services, Inc. (**itsi**) **BATTERY-Pack** is an autonomous tank battery local/remote monitoring, alarming, and control solution applicable to virtually any tank battery configuration. Itsi designed the **BATTERY-Pack** for individual wellhead tank batteries or larger centralized tank battery facilities where multiple wells produce to one location. The **BATTERY-Pack** provides an operator control and monitoring platform for local pumps, as well as remote wellhead pumping units and submersible pumps.

The foundation of the **BATTERY-Pack** is Control Microsystems's SCADAPack32™ PLC that is powered by a 120MHz 32bit CPU and has 8Mb SDRAM, 4Mb Flash and 1Mb of CMOS RAM memory. When combined with CMI's RealFlo gas measurement software the SCADAPack32™ has the ability to provide custody transfer quality gas measurement for up to 10 meter runs. 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 tank battery automation needs.

TANK BATTERY NETWORK DIAGRAM

P.O.C. SCADA Slave   Local Slave
Starter-Pack
P.O.C.

Pumping Unit #2

Local Slave
Starter-Pack

Saltwater Disposal Well

Host SCADA

H2O   Oil

Battery SCADA Slave   Local Master
Battery-Pack

Central Tank Battery

P.O.C. SCADA Slave   Local Slave
Starter-Pack
P.O.C.

Pumping Unit #3

P.O.C. SCADA Slave   Local Slave
Starter-Pack
P.O.C.

Pumping Unit #1

The **BATTERY-Pack** is designed to work in a local field area network control structure, working in conjunction with the **STARTER-Pack** or **WELL-Pack**. The **BATTERY-Pack** is the Master Controlling PLC, communicating to the **STARTER-Pack** and **WELL-Pack** over a local network using spread-spectrum radios. If any critical alarm is detected at the Tank Battery, the **BATTERY-Pack** issues shutdown alarms to the **STARTER-Pack** or **WELL-Pack**, avoiding expensive and time-consuming spills or accidents. The **BATTERY-Pack** also sends alarms back to the host SCADA System.

A heartbeat is monitored between the **BATTERY-Pack** and the **STARTER-Pack** or **WELL-Pack** to insure that the communications network is always working. If this heartbeat is lost, the **BATTERY-Pack** will issue an alarm, and the **STARTER-Pack** or **WELL-Pack** will shutdown the well to insure safety.

The **BATTERY-Pack** can also connect to a Pump Off Controller (POC) or Plunger Lift Controller (PLC) at the wellhead location, bring back vital information, and issue instructions to the controller.

BATTERY-Pack Setup

The alarm and control characteristics of the **BATTERY-Pack** are pre-determined then implemented during the initial configuration. The **BATTERY-Pack** IO, alarming and control configuration is determined with an easy-to-use "feature" table. The PLC programming utilizes this configuration to enable the appropriate features for the application. This configuration table makes the Battery-Pack installation, configuration, and commissioning by a person with limited PLC experience possible.

The basic program is designed to handle many different tank battery automation and remote control configurations. What does this mean to you? Consistency of field devices and ease of installation and setup all adding up to an installation and maintenance cost savings.

BATTERY-Pack Features

The **BATTERY-Pack** is designed to work alone or with the **STARTER-Pack** controller as an integral package. Using low power spread-spectrum radio modems the **BATTERY-Pack** continually communicates with the remote wellhead controller(s). Process values, statuses, and alarm conditions are visible at the tank battery's operator interface. If a user configurable, shut-in alarm condition occurs at the tank battery, the **BATTERY-Pack** issues shut-in commands to the **WELL-Pack** or **STARTER-Pack** and/or any well associated with that tank battery. Simultaneously the **BATTERY-Pack** communicates this information to the host SCADA system, which can dispatch a field operator to correct the problem and restore operations in a timely manner.

BATTERY-Pack I/O

The **BATTERY-Pack** is user configurable to meet the requirements of most tank batteries. The base model **BATTERY-Pack** is equipped with 8 analog inputs, 3 analog outputs, 16 digital inputs, 3 high-speed counter inputs, and 12 digital outputs. There are four serial ports capable of Modbus RTU Master or Slave communications. The base unit includes a full featured 4 x 20 LCD display as the operator interface. Mounted on the front panel are pushbuttons for alarm reset and individual pump starts/stops, as well as an Emergency Shutdown (ESD) button. The **BATTERY-Pack** IO is expandable to fit most tank battery automation applications.

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BATTERY-Pack™ Specifications

Tank Battery Automation..Oil, Gas, Coal Bed Methane, Water
Alarms...Operator Configurable Alarm Setpoints
Shutdowns..Operator Configurable Shutdown Setpoints
Remote Wellhead Control............Functions Integrally with *STARTER*-Pack and *WELL*-Pack Units for Wellhead Control
Flow Measurement..Capable of Custody Transfer Gas Measurement for up to 10 Meter Runs
Setup...Limited PLC Experience Required to Install and Setup Unit
Documentation...Schematics and Wiring Diagrams Included with Each Unit
SCADA Enabled...Pre-Configured SCADA Screens Available for Wonderware and CygNet
Expandability...*BATTERY*-Pack IO is Expandable as Required
Communications...Modbus Ready, 3 RS232, 1 RS232/485 Configurable, 1 Ethernet Port
Enclosure...NEMA 12 Hoffman Enclosure
Panel Wiring...............................Ready Wired for Field Installation; Field Connections are Isolated from Internal Wiring
Terminals...Weidmuller Terminals and Fuse Blocks Used Internally
Local Setup Connection...Weatherized RJ-45 Connector
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
Thermocouples..8 Thermocouple Inputs (base), Expandable to 64
Analog Outputs...3 Analog Outputs Available Onboard
Digital Inputs...16 Digital Inputs (base), Expandable to 128
Digital Outputs..12 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

Display

Electrical Rating..Class 1 Div 2 Hazardous Area Rating
Environmental..Rated for -40 to 158 degrees Fahrenheit
Display Size..4 Line by 20 Character Display
Display Type...Liquid Crystal (LCD) or Vacuum Fluorescent (VFD)
Function Keys..24 Programmable Keys
Protocol Support..Modbus RTU Master
Backlight Life...50,000 Hours

BATTERY-Pack™
Product Specification Sheet
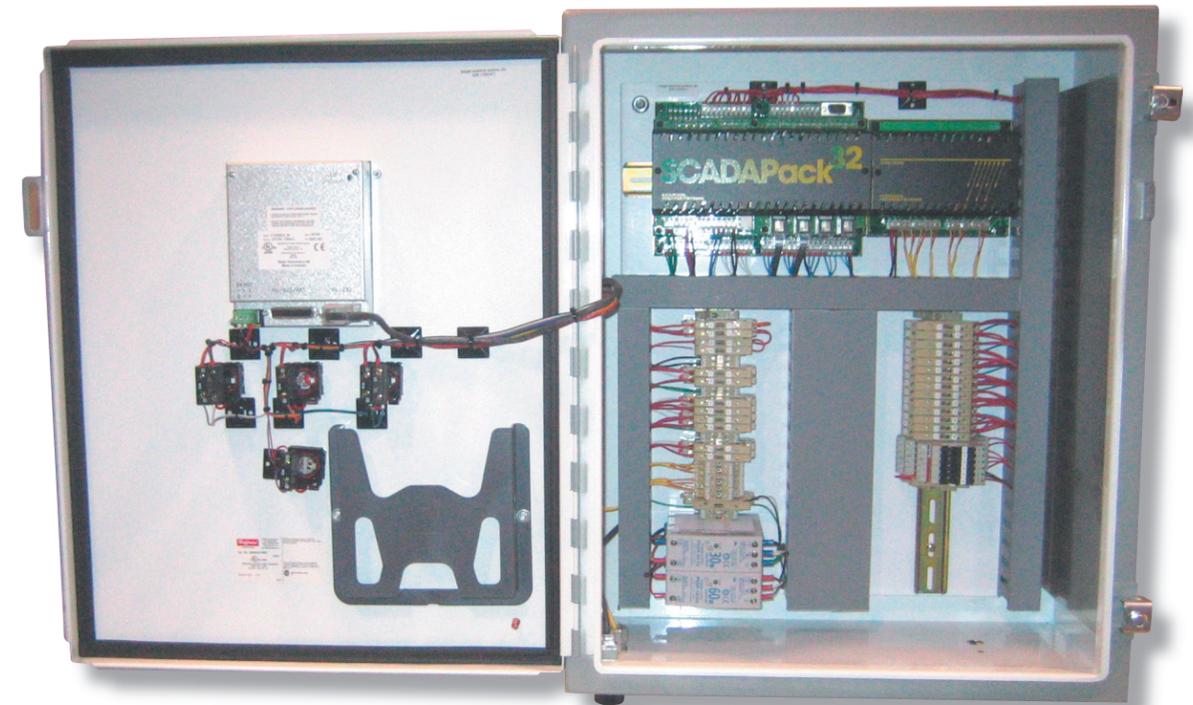
Features

- Tank Battery Local/Remote Control and Alarming

- Provides Local Pump Control

- Calculates Water Flowrate and Accumulates Volume

- Operator Configurable Alarm and Shutdown Setpoints

- Integrates with *STARTER*-Pack Wellhead Controller

- Limited PLC Experience Required for Setup

- Based on 32 But SCADAPack32™ PLC

- Class 1 Div 2 Hazardous Area Rating

- Operational from -40° F to 158° F

- 3 Year Warranty on SCADAPack32™ PLC

- Native Modbus Communications

- 3 RS-232, 1 RS-232/485 and 1 Ethernet Port

- SCADA Screens Available for Wonderware and CygNet

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