



Weatherford®

Production Optimization

TelePACE™ Ladder Logic Editor

Weatherford's production optimization division offers the TelePACE ladder logic editor. This software provides the ideal programming environment in which to develop ladder logic applications for SP series controllers. The program offers a user-friendly, flexible environment for developing, debugging and downloading ladder logic code to controllers.

Features

- Easy-to-use programming environment
- Comprehensive list of SCADA-specific functions
- Online development and editing
- Offline development and editing
- Variety of communications media and protocols supported
- C/C++ applications run concurrently with TelePACE applications

Easy-to-Use Environment

The program allows for both offline and online code development and provides local and remote access to your process by using Intranet and Internet technologies. It also provides controller diagnostic and configuration tools as well as custom functions for supervisory control and data acquisition (SCADA) specific applications.

TelePACE software allows engineers and electricians to quickly and efficiently develop analog and digital control sequences, configure proportional-integral-derivative (PID) process control, create data logs, calculate flow totals and perform communication functions.



TelePACE is a trademark of Kimray, Inc.

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Custom Ladder Logic Functions

The application combines the simplicity of traditional ladder logic with the flexibility and power of custom functions. Users familiar with ladder logic programming techniques and elements such as contacts, coils and timers can easily progress to the more advanced SCADA functions that are available with SP series controllers. These functions include:

- DIAL, INIM: Control dial-up phone line communication
- DLOG, GETL: Create datalog and retrieve logged data
- FLOW: Accumulate and log flow totals based on pulse-type input
- TOTL: Totalize and log values based on rate input
- HART: Send a HART protocol command and process the response
- MSTR: Send a serial protocol message
- MSIP: Send a TCP/IP protocol message
- PIDA, PIDD: Perform an analog or digital output-based PID algorithm
- SCAL: Scale an integer to a floating-point value
- SUBR: Define subroutines

Online Functionality

TelePACE software provides a facility for remote or local online editing and monitoring of ladder logic programs. Minor changes to the ladder logic code can be made online. This ensures that only the new code is written to the controller and not the entire application.

Program execution can be monitored in real time with logic power-flow being displayed on the logic network itself. Input/output (I/O) database variable values are conveniently displayed on the register editor dialog where custom lists of variables are easily created.

Process variables, controlled by the ladder logic code, can be forced to predetermined values. This is handy when debugging code in the absence of actual input process values or when temporarily removing a process input from service for maintenance purposes.





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Offline Development

Ladder logic code is easily and quickly developed using the built-in editing features of the program. These include the cutting and pasting of code fragments or entire networks, special configuration dialogs for complex function blocks and the use of subroutines to compartmentalize sections of code.

Important logic documentation can be appended to the network where the logic resides, making the code more understandable for future users. Tag names, assigned to individual I/O database points, can further enhance understandability.

Communications

The software supports a variety of communication media and protocols over the computer-to-controller link.

Communication media include:

- Direct-wired
- Dial-up
- Leased-line
- Licensed and spread-spectrum radio
- Ethernet TCP/IP
- SCADA Server (OPC)
- Supported protocols include:
 - Serial Modbus® remote terminal unit (RTU) and ASCII
 - DF1
 - DNP
 - Modbus/TCP and Modbus/UDP
 - Modbus RTU and ASCII in TCP and UDP



Modbus is a registered trademark of Modbus Organization, Inc.



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Concurrent C/C++ Code Execution

For additional programming power, a TelePACE application can execute in a SP series controller concurrently with C/C++ code. Process data generated in either application can be passed to the other through the common I/O database. This means, for example, that the results of complex mathematical algorithms, implemented using C/C++, can be used by the application to control the process.

In a typical oil and gas application, Weatherford's SS 4203 gas flow computer C/C++ code handles the gas flow calculation and logging functions while a concurrently-executing TelePACE application handles the remainder of the well site automation and communication duties; which could include the control of equipment such as pumps and motor starters.