

Tank Farm Level System

Monitor and Data Log Tank Farm Inventory on your PC Computer

TFT32 Tank Farm Transmitter

Accepts Ultrasonic and Pressure Sensors, or existing 4-20mA Transmitters
Local Display at Each Tank
Built-in Relay for Level Control
Add up to 5 extra Relays per Tank
RS-485 Serial Output
Low-cost, multi-drop Wiring

TFS Tank Farm Supervisor Software

PC-based Tank Inventory Supervision and Data Logging
Monitors up to 32 Tanks
Client version for LAN Users
Dial-up function for Modem connection to Remote Sites



Tank Farm Inventory Monitoring and Control System

The Simple Way to Monitor Tank Farm Inventory

Connect up to 32 Greyline TFT32 Tank Farm Transmitters and monitor tank inventory right from your PC computer. Mount one TFT32 Transmitter at each tank for local display and level control. Connect them in series or by Modem to your PC computer and use Greyline's Tank Farm Supervisor PC software to continuously monitor and datalog all tank levels. Allow LAN users to monitor some or all tanks in the network and to create their own datalog files.

Your Choice of Sensors

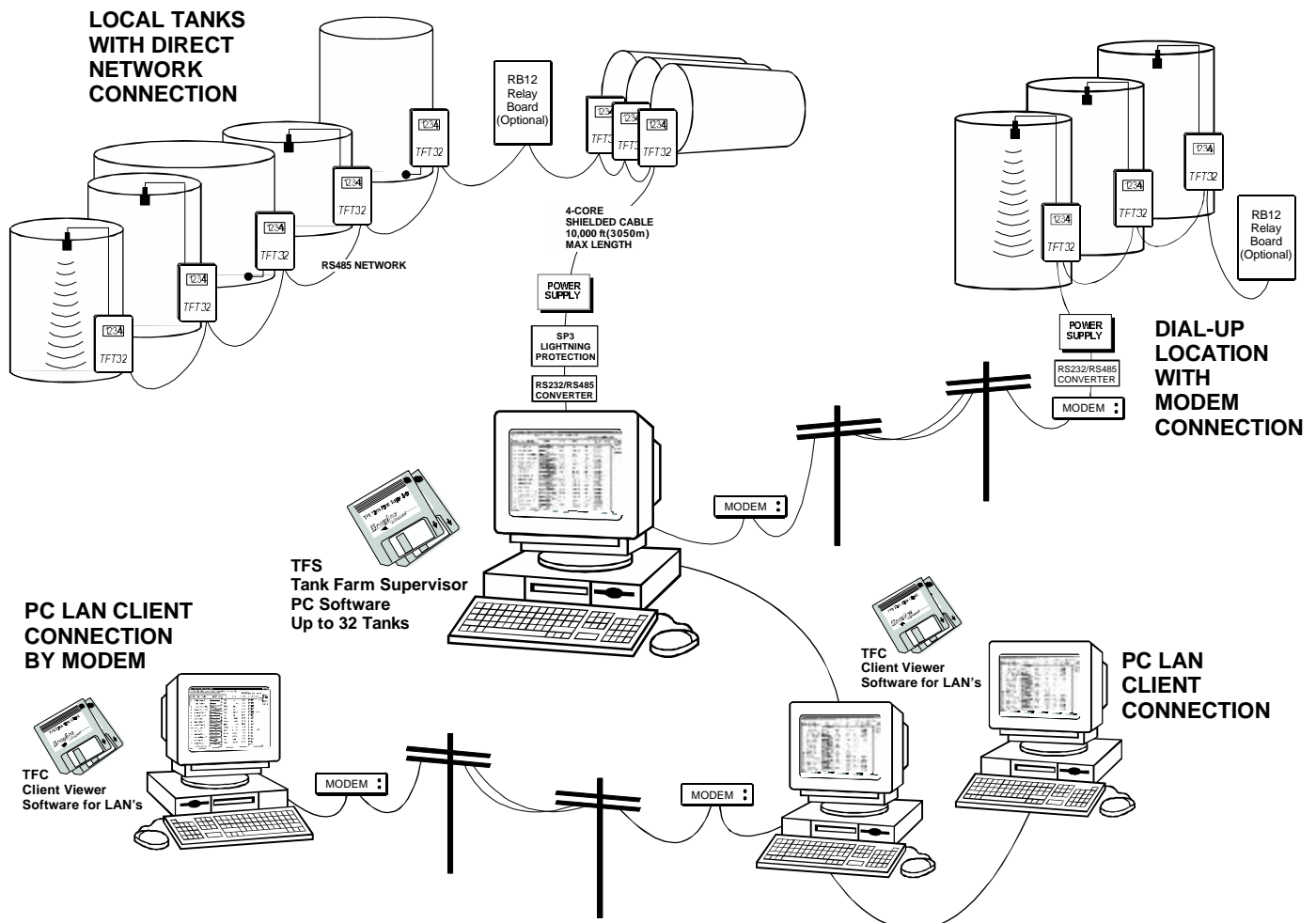
Use the best type of Sensor for each tank. Order the TFT32 with your choice of ultrasonic or pressure Sensors, or provide 4-20mA input signal from existing transmitters. The TFT32 Tank Farm Transmitter converts these different Sensor inputs, or 4-20mA to an RS485 digital signal. All Transmitters share the same 4-conductor cable for simple, low cost installation.

Greyline
instruments inc.

RELIABLE MEASUREMENT AND CONTROL

Monitor up to 32 Tanks

Local Display at Each Tank + Supervisory PC Software



Tank Farm Inventory and Control—made Simple!

1. Mount your choice of ultrasonic or pressure sensor (or existing 4-20mA transmitter) in each tank.
2. Install one TFT32 Transmitter at a convenient location near each tank and connect its Sensor. Use the built-in keypad to calibrate the measurement span and relay set points.
3. Connect each TFT32 Transmitter in a series terminating at your PC computer with an RS485 to RS232 converter (and optional 24VDC power supply). For remote locations connect each TFT32 Transmitter in a series to a modem and telephone line.
4. Run the Greyline TFS Tank Farm Supervisor program on your PC and configure it to display each tank level in your choice of engineering units (gallons, liters or any unit of measure). Set the program to dial-up tanks at remote locations with modems over regular telephone lines. Enable data logging for any or all of the tanks in your system.
5. Use Greyline TFS software to calibrate optional Control Relays for alarms or pump control - add up to 5 extra Relays for each tank.
6. Sit back and relax. No more climbing and dipping tanks for inventory. Let the TFS Tank Farm Supervisor software continuously scan your tank farm, display level alarms, and log individual tank inventory at programmable intervals to disk files on your PC. You can even share Tank Farm information over your PC LAN with optional Greyline TFC Client Viewer software.



PC Software TFS Tank Farm Supervisor

Runs on any PC with Windows™ 3.1+, Windows™ 95 or NT
Requires only 2MB drive space plus allowance for data logging files

Main Screen - TFS Tank Farm Supervisor

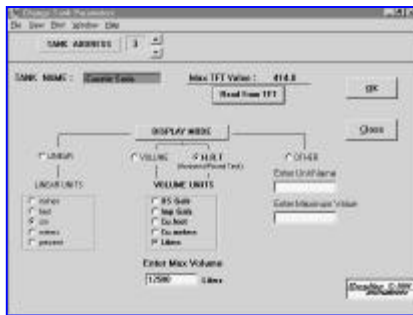
TFS software displays the key information for each TFT32 Transmitter on one main screen: the tank or transmitter name, a bar graph representing tank level (or any other process variable), measurement units, temperature (ultrasonic sensors only), data logging status and relay status. The system scans 32 tanks in less than 8 seconds and updates the display continuously. It is simple and incredibly powerful!

TFS software is supervisory—the TFT32 Transmitters, displays and control relays will continue to operate without PC connection or TFS software. You can run other programs on the PC at the same time.

Program features are accessed through drop-down menus and settings are password-protected. A Help menu includes complete program information and instructions.

TFT32 Transmitters can be connected in a network directly to your PC, plus they can be monitored through modems over regular telephone lines. With optional "Client" software, tank farm information can be shared over any PC LAN (Local Area Network).

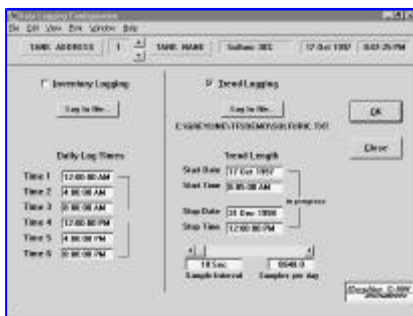
ADDR	TANK NAME	LEVEL	LEVEL	UNITS	LOG'N	TEMP	RELAYS
1	Sulfuric 30%		6438	US Gals	<input checked="" type="checkbox"/>	34 °C	1-2-3-4-5-6
2	Sulfuric 32%		1181	US Gals	<input checked="" type="checkbox"/>	25 °C	1-2-3-4-5-6
3	Caustic Soda		12365	Liters	<input checked="" type="checkbox"/>	30 °C	1-2-3-4-5-6
4	Number C		1264	US Gals	<input checked="" type="checkbox"/>	37 °C	1-2-3-4-5-6
5	Diesel (West)		18.8	cm	<input checked="" type="checkbox"/>	17 °C	1-2-3-4-5-6
6	Diesel (East)			Disrupt	<input checked="" type="checkbox"/>	Pending	1-2-3-4-5-6
7	Hydrochloric		0.00	Cu meters	<input checked="" type="checkbox"/>	33 °C	1-2-3-4-5-6
8	Muriatic Acid		279.1	cm	<input checked="" type="checkbox"/>	25 °C	1-2-3-4-5-6
9	Waste Sludge		0.0	feet	<input checked="" type="checkbox"/>	16 °C	1-2-3-4-5-6
10	Water Reservoir		11.75	Cu meters	<input checked="" type="checkbox"/>	28 °C	1-2-3-4-5-6
11	Discharge pH		5.770	pH	<input checked="" type="checkbox"/>	23 °C	1-2-3-4-5-6
12	Discharge Flow		1115	GPM	<input checked="" type="checkbox"/>	29 °C	1-2-3-4-5-6
14					<input checked="" type="checkbox"/>		1-2-3-4-5-6
15					<input checked="" type="checkbox"/>		1-2-3-4-5-6
16					<input checked="" type="checkbox"/>		1-2-3-4-5-6



Tank Parameters Screen

TFS software automatically reads basic calibration information from each TFT32 Transmitter. Use this screen to edit tank or transmitter names and the measurement units displayed on your PC. Choose "Linear" (length) units: inches, cm, etc., or "Volume" units: gallons, liters etc., or "Other" units like lbs, barrels, pH or gpm. Select "H.R.T." mode for volumetric display of horizontal round tanks. Changes in the Tank Parameters screen only affect the PC display (errors in settings will not affect calibration or operation of TFT32 Transmitters).

Selection of "Other" units allows different types of instruments to be used in the system. Combine level or inventory monitoring with other process variables like flow, pH, conductivity, pressure etc. TFS software automatically converts different units of measurement as you change tank parameters.



Data Logging

Data Logging functions are built into TFS software. Data is stored in comma delimited files on your PC disk drive.

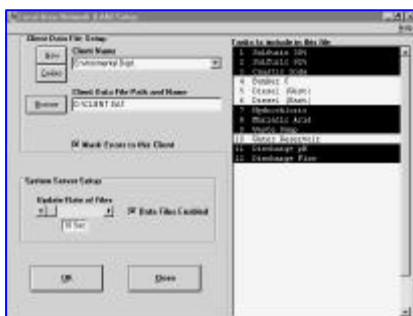
Automatically gather detailed information in separate "Inventory" and "Trend" logging files for each TFT32 Transmitter.



Dial-Up Locations

Connect to Tanks at any location with modems over regular phone lines. Set the starting time of day and how frequently each remote site is dialed.

Let your PC do the work automatically—up to 32 tanks or transmitters can be monitored at 32 separate locations.



PC LAN Function

Share tank farm information with others on your PC LAN. Any number of LAN "clients" can simultaneously monitor some or all transmitters in the system with optional TFC Client software. Clients can even create their own data logging files.



Extra Control Relays

Calibrate up to 10 optional RB12 Relay Boards from this password-protected screen. Assign up to 5 extra control relays to each TFT32 in the network. Set the operating mode, and ON/OFF set-points for each relay.

After calibration, extra relays communicate directly with the TFT32 Transmitters.

Sensors

Each TFT32 Transmitter requires one Sensor, or a 4-20mA signal input. Choose the best Sensor for each tank/application. Select from the Ultrasonic and Pressure models listed below, or order the TFT32 without a Sensor and supply your own 4-20mA signal input from an existing Transmitter. Consult your Greyline Representative for applications advice and chemical compatibility information.



Ultrasonic Sensors

Non-Contacting, temperature compensated - mount at the top of the tank

MODEL	MEASUREMENT RANGE	MOUNTING	EXPOSED MATERIALS	STANDARD CABLE LENGTH
PZ25T	32 ft / 10 m	3/4" NPT (F)	PVC and Teflon	20 ft / 6 m coaxial
PZ25TE	32 ft / 10 m	3/4" NPT (F)	Teflon	20 ft / 6 m coaxial
PZ50T	50 ft / 15.6 m	3/4" NPT (F)	PVC and Teflon	50 ft / 15 m coaxial

Note: Ultrasonic Sensors are also available with 3", 4" or 6" flanges for tanks with flanged mounting locations. Greyline Sensors are available rated intrinsically safe for Class I,II,III, Div. I,II, Groups C,D,E,F,G hazardous locations (with optional Intrinsic Safety Barrier).

Pressure Sensors

Choose Threaded type for mounting at the base of the tank, or Submersible type for suspended mounting from the top of the tank.

MODEL	PRESSURE RATING	FT / M OF WATER	MOUNTING	EXPOSED MATERIALS	STANDARD CABLE LENGTH
PS11S	5 psi / 0.3 bar	11 ft / 3 m	submersible	316 and 15-5 stainless steel	20 ft / 6 m
PS11T	5 psi / 0.3 bar	11 ft / 3 m	1/4" NPT (F)	303 SS, PVC, polyurethane	2 ft / 0.6 m
PS17S	7.5 psi / 0.5 bar	17 ft / 5m	submersible	316 and 15-5 stainless steel	23 ft / 7 m
PS17T	7.5 psi / 0.5 bar	17 ft / 5 m	1/4" NPT (F)	303 SS, PVC, polyurethane	2 ft / 0.6 m
PS23S	10 psi / 0.67 bar	23 ft / 7 m	submersible	316 and 15-5 stainless steel	30 ft / 9 m
PS23T	10 psi / 0.67 bar	23 ft / 7 m	1/4" NPT (F)	303 SS, PVC, polyurethane	2 ft / 0.6 m
PS35S	15 psi / 1.0 bar	35 ft / 10 m	submersible	316 and 15-5 stainless steel	40 ft / 12 m
PS35T	15 psi / 1.0 bar	35 ft / 10 m	1/4" NPT (F)	303 SS, PVC, polyurethane	2 ft / 0.6 m
PS46S	20 psi / 1.3 bar	46 ft / 14 m	submersible	316 and 15-5 stainless steel	55 ft / 17 m
PS46T	20 psi / 1.3 bar	46 ft / 14 m	1/4" NPT (F)	303 SS, PVC, polyurethane	2 ft / 0.6 m
PS69S	30 psi / 2.0 bar	69 ft / 21 m	submersible	316 and 15-5 stainless steel	75 ft / 23 m
PS69T	30 psi / 2.0 bar	69 ft / 21 m	1/4" NPT (F)	303 SS, PVC, polyurethane	2 ft / 0.6 m
PS102S	44 psi / 3.0 bar	102 ft / 31 m	submersible	316 and 15-5 stainless steel	105 ft / 32 m
PS115T	50 psi / 3.45 bar	115 ft / 35 m	1/4" NPT (F)	303 SS, PVC, polyurethane	2 ft / 0.6 m
PS170S	72 psi / 5.0 bar	170 ft / 52 m	submersible	316 and 15-5 stainless steel	174 ft / 53 m
PS173T	75 psi / 5.2 bar	173 ft / 52.7 m	1/4" NPT (F)	303 SS,PVC, polyurethane	2 ft / 0.6 m

Note: Cable for Submersible Pressure Sensors is shielded, watertight with a molded polyurethane jacket. Threaded type Sensors include 2-conductor, 22 gauge shielded cable.

4-20mA Input

Use your existing 4-20mA Transmitters. You can order TFT32's factory-configured to accept 4-20mA signal from any Transmitter: level, flow, pH etc.

Specifications

TFT32 Transmitter

- ✓ Large 4-digit LCD Display at each Tank
- ✓ Watertight, dust tight Enclosure
- ✓ Built-in Relay for Alarm or Control
- ✓ Simple Calibration with 2-button Keypad
- ✓ Low cost, High Accuracy
- ✓ Accepts ultrasonic and pressure Sensors, or 4-20mA input
- ✓ Self testing - Displays and Controls, with or without PC Computer connection



TFT32 Transmitters Specifications

Electronics Enclosure:	Watertight and dust tight NEMA4X (IP 66) fiberglass with clear, shatterproof cover
Display:	Large (3/4", 19 mm high) 4-digit LCD
Calibration:	Enter minimum and maximum distance in inches or cm
Programming:	Built-in 2-button keypad with Menu selection. Calibration parameters are permanent when stored (even through power interruptions)
Power Input:	24VDC, (120mA) 3 watts maximum
Output:	isolated RS485, selectable 2400-19200 baud
Signal Relay:	Quantity 1, rated 120/240VAC or 24VDC, 1 ampere, programmable for level alarm, sensor failure, pump control or temperature alarm
Temperature Compensation:	(Ultrasonic Sensors only) Automatic, continuous
Surge Protection:	Sensor, RS485 and DC power input
Operating Temperature:	-13° to 140°F (-25° to 60°C)
Approximate Weight:	5 lbs. (2.25 kg)
Enclosure Dimensions:	4.9" x 6.9" x 3" (125 x 175 x 75 mm)

TFT32 Transmitter Options

Sensors:	Select from ultrasonic or pressure models, or order without Sensor ready for 4-20mA input
Hazardous Locations:	CSA rated Intrinsically safe (Ultrasonic Sensors only)
Power Input:	120VAC or 220VAC 50/60Hz
Enclosure Panel Mount:	Flange assembly mounts standard enclosure

Software

TFS:	Tank Farm Supervisor for Windows - Displays up to 32 TFT32 Transmitters, Dial-up capability for remote locations, creates data logging and LAN client files, calibrates RB12 Relay Boards
TFC Client:	Tank Farm Client Viewer for LAN's - Used with TFS Tank Farm Supervisor for LAN users to view some or all TFT32 Transmitters and to create separate data logging files

Power Supplies/Converters

PS150AI:	Power Supply - 150W, 115VAC 50/60Hz input, 24VDC output. Powers up to 32 TFT32 Transmitters and 10 RB12-24V Relay Boards
PS150EI:	Power Supply - 150W, 230VAC 50/60Hz input, 24VDC output. Powers up to 32 TFT32 Transmitters and 10 RB12-24V Relay Boards
485OIC:	RS485/RS232 Converter
SP3:	Lightning Surge protection - protects your PC in the event of incoming lightning/electrical surges from field TFT32 network wiring

Relay Boards

RB12-24V:	Relay Board - 12 control relays rated 5 amp SPDT, Communicates directly with TFT32 Transmitters. Maximum 10 RB12 Relay Boards may be installed in one TFT32 network. Maximum 5 relays may be assigned to each TFT32 Transmitter.
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Tank Farm Inventory and Control



Greyline TFT32 Tank Farm Transmitter Combines Local Digital Displays with Centralized PC Monitoring

Operators can view tank level with the TFT32's built-in 4 digit LCD display while inventory of the entire tank farm can be simultaneously monitored on a central PC computer. Install one Sensor and one TFT32 Transmitter for each Tank. Use your choice of ultrasonic and pressure sensors and mount a Greyline TFT32 Transmitter at a convenient location near each tank.

Each TFT32 includes one built-in Relay that can be calibrated for level alarm, pump or valve control, temperature alarm, or sensor fault alarm. Additional control relays can also be installed in the system.

Simple, Low-Cost Wiring

Run a single 4-conductor wire from Transmitter to Transmitter terminating at your PC computer. Install optional Control Relays at any location in the network. Only one wire run is required for the entire system. Add modems and you can monitor tanks at any locations over regular phone lines!

New - Client Software for LAN's

You can configure the TFS Tank Farm Supervisor software program to allow PC's on any LAN (Local Area Network) to monitor some or all of the tanks in the system. Ideal for sharing information across Departments. With optional TFC-Client software LAN users can view selected tank/transmitter information and even write their own data logging files, but cannot make any changes in the monitoring network or calibration.

Automatic Data Logging

Automate your Tank Farm inventory by storing data logging files on your PC computer's disk drive. Greyline's TFS Tank Farm Supervisor software can store inventory at the end of each work shift, and/or store levels every few seconds, minutes or hours. Data logging can be enabled or disabled for each individual tank. Data log files can be used in any spreadsheet or database program.

Not just Tank Farms...

TFT32 Transmitters accept 4-20mA signal input from any transmitter. So you can measure process variables including pressure, flow, pH, conductivity, turbidity etc. TFS Tank Farm Supervisor software allows you to display and log data from each Transmitter in any engineering units.

How To Order

Contact a Greyline sales representative in your area, or phone our sales engineers. Describe your requirements and our quotation will be prepared for you immediately.

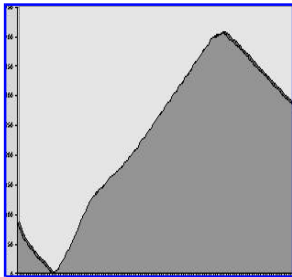
Applications Hotline

Take advantage of Greyline's application experience. Phone 613/938-8956 or 315/788-9500 for advice and information on how to install, operate or service any Greyline instrument in your application.

The Greyline Guarantee

No Risk Appraisal - Greyline Instruments must meet your requirements. Discuss your application with a Greyline representative to arrange a 30-day trial.

Quality of Materials and Workmanship - All instruments manufactured by Greyline are warranted against defects in materials and workmanship for a period of one year from date of purchase. Refer to our Limited Warranty packed with each product.



Create Graphs from
TFS Data Log Files

Greyline
instruments inc.

RELIABLE MEASUREMENT AND CONTROL

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