FLUKE®

700G/TRACK

Data Logging Software

Users Manual

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Introduction

The Fluke 700G/TRACK Software (the Software) extends the functions of the Fluke 700G Series Pressure Gauge (the Gauge). Use this manual with the *700G Series Users Manual*.

The Software lets you:

- Set up data logging configuration in the Gauge
- Upload logged data from the Gauge, including export of run data to text, comma separated values (CSV), and Excel files
- Clear logged data from the Gauge

Minimum Requirements

To use the Software, Microsoft Windows 2000 (SP4), XP (SP2), Vista, or Windows 7 is necessary. To export data to Excel files, Microsoft Excel version 2002 or newer is necessary.

How to Contact Fluke

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-6714-3114
- Singapore: +65-738-5655
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at www.fluke.com.

To register your product, visit http://register.fluke.com.

To view, print, or download the latest manual supplement, visit http://us.fluke.com/usen/support/manuals.

Before You Start

Before you start, read this manual to learn more about the Software and its functions.

Standard Equipment

Make sure your data logging kit comes with:

- *700G/TRACK Software*
- USB Cable

If something is missing, contact Fluke. See the How to Contact Fluke section.

Installation

To install the Software:

1. Put the Software CD into the CD drive on your computer.
2. The install program starts automatically. If it does not, use Windows Explorer to find the CD drive and click on the "setup.exe" program.
3. Follow the directions on the screen to install the Software.

Overview

The gauge can record (log) multiple data sets, each of which is identified by a sequential run number. Data logging runs use new items put into the Gauge's CONFIG menu sequence to start and stop the runs. Logging parameters can be changed for each data run. The logging runs can be as short or long as necessary. The length of the runs align with the storage capacity of the Gauge.

For each sample, the Gauge can log pressure or it can log pressure and temperature. This selection applies to all runs and must be made before you start the first run.

Logging Pressure

When logging only pressure, the Gauge has a capacity of 8500 data records. These records keep run identification and log sample data. Seven records are necessary for each new data logging run for run identification overhead. One record is necessary to log each sample, except for the triple-value case (average, minimum, maximum) where three records log each sample set.

For a single run, the capacity for all but the triple-value case is 8493 sample sets, and the capacity for the triple-value case is 2831 sample sets.

Logging Pressure and Temperature

When pressure and temperature are logged, the Gauge has a capacity of 5100 data records that keep run identification and log sample data.

For a single run, the maximum capacity for all but the triple-value case is 5093 samples, and the maximum capacity for the triple-value case is 1697 sample sets.

Intervals

The interval time setting sets the frequency of sample calculation and storage. Eleven discrete interval times are available and range from 1 second to 1 hour.

A sample value is calculated at the end of each interval and comes from all of the pressure measurements made during that interval. The sample value can be the last measurement made in the interval, or it can be the average, minimum, maximum, or median of all of the measurements made during that interval.

A sample value can be kept for each interval during the run, only for those intervals where the sample value is larger than a specified high or low limit, or only for those intervals where the pressure differential during the interval is larger than a maximum span.

Data Logging Modes

Two data logging modes are available, Download and Demand. Multiple log runs can be used in these modes, with the most number of runs dependent on the number of samples recorded in each run and the Gauge capacity.

Use Download mode to record or change the data logging parameters and send them to the Gauge. The gauge stays in this mode until the application or the Gauge "**CLEAr DATA**" function is used to clear the recorded data in the Gauge. At this point, the mode is set to Demand. In Download mode the parameters cannot be changed with the Gauge menus and the downloaded values are used for each new log run. Download mode can be used to change the logging parameters between runs and will not change logged data already in memory.

When the data logging mode is Demand mode, you can set the Gauge to log data without a computer connection. You can record and change some of the data logging parameters with the Gauge menus, while the remaining parameters default to set values. The gauge menus can be used to change the logging parameters between runs. This will not change previously logged data.

Menus

The Software menus duplicate the functions of the Gauge. You can use the buttons or the Software menu to interface with the Gauge.

File Menu

The File Menu lets you exit the Software.

Gauge Menu

The Gauge Menu contains the functions that interact with the Gauge:

Connect Connect the Gauge and shows the Gauge description and data logging setup. On the Primary Display, select the communication port that the Gauge is connected to before you use this function. See How to Connect to the Gauge in the Primary Display section.

Disconnect Disconnect from the Gauge. See How to Disconnect from the Gauge in the Main Screen section.

Upload Data Upload all data logging runs from the Gauge and show them on the Log Upload Display. See the Log Upload Display section. The data can be exported from that display. See the How to Upload Logged Data description in the Main Screen section.

Clear Data Erase all data logging runs from the Gauge. See How to Clear Logged Data in the Main Screen section.

Send Setup Send the setup data to the Gauge. See the How to Send Setup Configuration description in the Main Screen section.

Retrieve Setup Get the setup data from the Gauge. See the How to Retrieve Setup Configuration description in the Main Screen section.

Options Menu

The Options Menu specifies the default display and export options. See the Display Options and Export Options sections.

Help Menu

The functions necessary for help and support are in the Help Menu:

Help	Shows online help
Support	Shows customer support data
Registration	Tells you how to register the Software
About	Shows Software description and version data

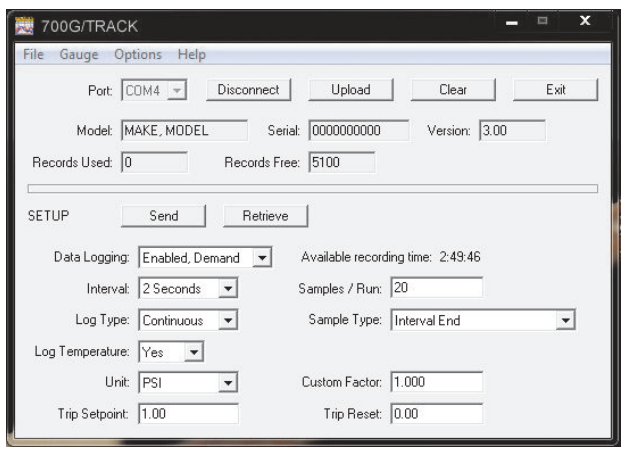
Main Screen

The Main Screen is shown in Figure 1. The Main Screen controls let you:

- Connect to the Gauge
- Disconnect from the Gauge
- Upload logged data
- Clear logged data
- Exit the application

This data is shown on the main screen when you connect the Gauge:

- Gauge model
- Serial number
- Firmware version of the Gauge
- Number of data logging records used
- Number of data logging records free



gto001.jpg

Figure 1. The Main Screen

The lower section of the Main Screen shows controls you can use to configure data logging parameters in the Gauge, send the configuration to the Gauge, and retrieve the current configuration from the Gauge.

How to Connect to the Gauge

To use the Software with the Gauge immediately:

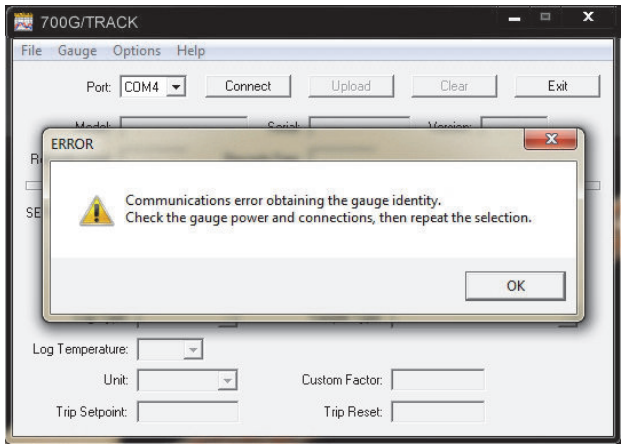
1. Double-click the Software icon on the desktop to start the Software.
2. Turn on the Gauge.
3. Connect the USB cable to the PC and to the Gauge.
4. On the Software's Main Screen, select the applicable COM Port from the Port dropdown.

   Note

   COM Port detection is not automatic. If necessary, go to ***Windows/Settings/System/Hardware/Device Manager*** *on your PC to determine the USB Serial Port.*
5. Push the **Connect** button. The Main Screen populates with the settings from gauge. See the Main Screen section for more information.

   Note

   If the Gauge is off or if the USB cable is not connected, you will receive an error message. See Figure 2.



gto004.jpg

Figure 2. Connection Error Alert

How to Disconnect from the Gauge

To disconnect from the Gauge, click the **Disconnect** button. The button description and function changes to **Connect** and all shown data is removed.

How to Upload Logged Data

To upload logged data, click the **Upload** button. The logged data is uploaded and shown on the Log Upload Display. A display shows percent complete and an estimate of the time remaining in the upload. See the Log Upload Display section.

How to Erase Logged Data

To erase logged data, click the **Clear** button. After you give confirmation that logged data is to be erased, all logged data is removed from the Gauge. The data logging mode is set to **Enabled**, **Demand**, and all data on the display is refreshed.

How to Send Setup Configuration

After you make the necessary selections, click the **Send** button. The configuration is sent to the Gauge and all data on the display is refreshed. The data logging mode must be set to **Enabled**, **Download** to change more than the mode.

How to Retrieve Setup Configuration

To retrieve setup configuration data, click the **Retrieve** button. The gauge description, current data capacity, and setup are read from the Gauge and shown in the applicable fields.

Setup Configuration Fields

The subsequent sections tell you how to set up the configuration fields.

Data Logging Mode

Disabled

This command turns off data logging in the Gauge. All data logging functions are removed from the Gauge's CONFIG menu sequence.

Enabled, Download

Turns on data logging in the Gauge with all logging parameters downloaded from the Software. All data logging functions related to parameter changes are removed from the Gauge's CONFIG menu sequence. The only gauge functions available are start and stop of data logging, show the number of free records, and erase all logged data.

Enabled, Demand

Turns on data logging in the Gauge with all logging parameters set. This can only be used to upload logged data, erase all logged data, get data logging parameters, and change the data logging mode. The data logging functions that are available in the Gauge's CONFIG menu sequence are start and stop data logging, show the number of free records, change the logging interval, change the samples each run, and erase all logged data. The log type is set at **Continuous** and the sample type is set at **Interval End**.

Interval

Use one of these sampling intervals:

- 1, 2, 5, 10, or 30 seconds
- 1, 2, 5, 10, or 30 minutes
- 1 hour

Samples/Run

The Samples/Run field is the maximum number of samples to log each run. This can range from 1 to 8500.

Log Temperature

Select **Yes** or **No** to log temperature.

Log Type

Continuous

A sample is kept at each interval of the run. The sample value is specified by the sample type selection below. This is the most common type of logging.

Trip high

Interval samples are kept during the run only when the sample values are above a high limit. Sample storage starts when a sample value of the interval becomes more than the **trip setpoint**, and continues at each interval until a subsequent sample value of the interval is lower than the **trip reset**. Sample storage then stops until a sample value, again, becomes more than the trip setpoint. The sample value is recorded and specified by the sample type selection below.

Trip low

Interval samples are only kept during the run when the sample values are above a low limit. Sample storage starts when a sample value of an interval becomes less than the **trip setpoint**, and continues at each interval until a subsequent interval's sample value becomes larger than the **trip reset**. Sample storage then stops until a sample value again becomes less than the trip setpoint. The sample value is recorded and specified by the sample type selection below.

Trip span

Interval samples are kept during the run only when the pressure difference during the interval is more than a maximum span or range. Sample storage starts when the difference between a maximum and minimum measurement of an interval becomes larger than the **trip setpoint**, and continues at each interval until a subsequent difference of the interval becomes less than the **trip reset**. Sample storage then stops until a difference of the interval again becomes more than the trip setpoint.

Sample Type

The Sample Type field is recorded as one of these fields:

- Interval end- The last measurement made in the sample interval.
- Average of all measurements made in the sample interval.
- Minimum of all measurements made in the sample interval.
- Maximum of all measurements made in the sample interval.

- Median of all measurements made in the sample interval, the midpoint between minimum and maximum.
- Average, minimum, and maximum of all measurements made in the sample interval. Three records of storage for each logged sample set are necessary. This decreases capacity by 3.

Unit

Pressure units known by the current gauge configuration. Custom units are included.

Custom Factor

Custom unit conversion factor shown as units for psi.

Trip Setpoint

Trip setpoint as specified for the Log Type selected above, shown in the log unit selected above.

Trip Reset

Trip reset as specified for the Log Type selected, shown in the log unit selected.

Log Upload Display

Push the **upload** button to upload data files from the Gauge. The Primary display shows each data logging run found in the uploaded data. To show a run's data in the lower section of the display, click on it to highlight it.

Use the Display Mode box to select the subset of run data shown:

- All Data,
- Selected Data
- Readings Only

When the Display Mode is set to **Selected Data**, click the **Change Selection** button to change the display options. See the Display Options section.

The gauge has no real-time clock. The uploaded data is initially tagged by elapsed day and time from the start of a run. The runs are identified by a numeric position in the uploaded data. To record a label that gives more data about the run and to add a calendar date and time, highlight the run and click the **Set Date/Label** button. The base date and time are added to the elapsed day and time for each sample.

To export one run, highlight the run and click the **Save Run** button. The Export Options screen is shown to let the options be customized for exporting this run. A standard Save As screen is then shown. Select the file name and the folder where the file is to be put. Click the **Cancel** button of one of the screens to skip the export. See the Export Options section for more.

To export all runs, click the **Save All** button. The Export Options screen is shown to let the options be customized for exporting these runs. The same options are used for all runs. For each run, a Save As screen is then shown. Select the file name and the folder where the file is to be

put. Click the **Cancel** button of the Save As screen to skip the export of that run. Click the **Cancel** button of the Export Options screen to skip the export of all runs. See the Export Options section.

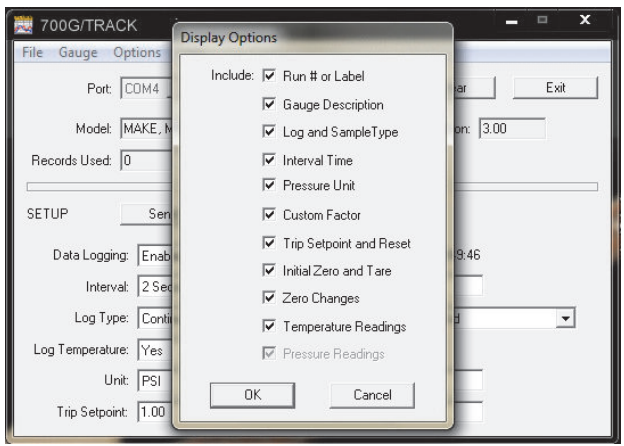
The default location for files is the folder "Fluke\700G Track" in "My Documents".

Display Options

Use the Display Options screen (in the Options Menu) to change the default selections for the run description fields. When data is first uploaded, the selections are set to the default values. After the first data display, the selections can be temporarily changed for the length of the data display. In the Display Options screen, check each field that is to be shown when the display mode is set to Selected Data. Logged pressure (Pressure Readings on the menu) is always shown. The Display Options Screen is shown in Figure 3.

The Display Options are:

- Run # or Label
- Gauge Description
- Log and Sample Type
- Interval Time
- Pressure Unit
- Custom Factor
- Trip Setpoint and Reset
- Initial Zero and Tare
- Zero Changes
- Temperature Readings
- Pressure Readings (always selected)

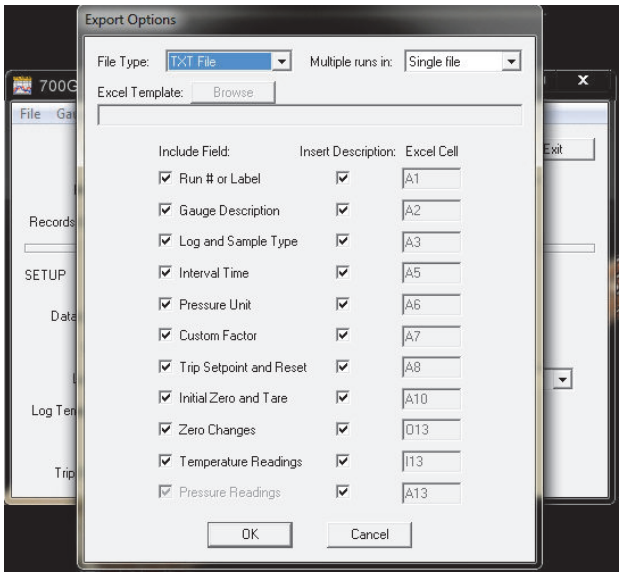


gto002.jpg

Figure 3. The Display Options Screen

Export Options

Use the Export Options screen to change the default selections for the file type and run description fields to be exported from the Log Upload Display. When data is first uploaded, the selections are set to these default values. After the first data display, the selections can be temporarily changed for each export, and stay changed for the length of the data display. Logged pressure is always exported. See Figure 4.



gto003.jpg

Figure 4. The Export Options Screen

The selections are as follows:

File Type

TXT File

You can print a formatted text file or open it in a text editor. The run description fields are put on isolated lines at the start of the file, followed by a line for each logged data sample and zero change.

CSV File

An Excel Comma Separated Variable file has each item on a line in quotation marks and all items are separated by commas. The run description fields are put on isolated lines at the start of the file, followed by a line for each logged data sample and zero change.

New Excel File

A new Excel spreadsheet (xls) file. The locations of the run description fields, logged data samples, and zero changes in the spreadsheet are shown in the Excel Cell column below. See the Minimum Requirements section.

Excel Template

An Excel spreadsheet (xls) file that comes from a predefined Excel template (xlt) file. The locations of the run description fields, logged data samples, and zero changes in the spreadsheet are put into Excel Cell columns. These locations must be synchronized with the set data in the template. See the Minimum Requirements section. See the Excel Templates section.

Multiple runs in

Single File

When the upload has many runs, export all runs to one file.

Separate Files

When the upload contains many runs, export each run to an isolated file.

Excel Template

When the file type is set to **Excel Template**, the template you will use is selected here. Click on the **Browse** button and go to the necessary template file. See the Excel Templates section.

Include Field

Put a mark by each field to be exported. Logged pressure data is always exported.

Insert Description

An optional field description can be included for each field you will export. Put a mark on each field description to be included.

Excel Cell

Record the cell location where you put the data. Cell columns can range from A to YZ. Cell rows can range from 1 to 99999. The data fields are put as follows:

Run Description Fields

If the field description is included, the field description is put into the applicable cell and the field value is put into the subsequent cell to the right. If the field description is not included, the field value is put in the specified cell. The Gauge Description has four values:

- Manufacturer
- Model
- Serial number
- Firmware version

These are in one cell isolated by commas. The Log and Data Type, Trip Setpoint and Reset, and Initial Zero and Tare fields each have two data items that occupy two rows. Each has its own description and field value, with the second row below the first.

Zero Changes

Zero changes are shown one for each row and start at the specified cell row. There are four field values for each zero change:

- the date
- the time
- the new zero setting
- the pressure unit

The second, third, and fourth values are put into the cells to the right of the first. If the field description is included, the field description is put into the applicable cell column and the field values are put into the cell columns to the right. If the field description is not included, the field values are put in the applicable cell columns.

Pressure Readings

Pressure is shown one for each row and start at the specified cell row. There are four field values for each value pressure indication:

- Date
- Time
- Reading
- Pressure unit

The second, third, and fourth values are placed in the cells next to the right of the first. There are six field values for each triple value pressure reading:

- Date
- Time
- Average reading

- Minimum reading
- Maximum reading
- Pressure unit

The second, third, and further values are put into cells to the right of the first. If the field description is included, the field description is put into the specified cell column and the field values are put into the cell columns to the right. If the field description is not included, the field values are put in the specified cell columns.

Temperature Readings

If temperature indications are in the uploaded data, they are shown one for each row and start at the applicable cell row. There are two field values for each value sample:

- Temperature
- Temperature unit

The second value is put in the cell to the right of the first. There are four field values for each triple value sample:

- Average temperature
- Temperature at the time of the minimum pressure
- Temperature at the time of the maximum pressure
- Temperature units

If the field description is included, the field description is put in the specified cell column and the field values are put in the cell columns to the right. If the field description is not included, the field values are put in the specified cell columns.

Excel Templates

An Excel template is made like a typical spreadsheet, but the file is named with the ".xlt" file extension. The templates can have predefined text, titles, graphs, and calculations which you can use with uploaded pressure data to make a complete spreadsheet presentation. The templates can be used many times, so it will not always be necessary to reformat some of your raw data.

The field options and Excel cell locations specified on the Export options screen must be synchronized with the predefined data in the template to make sure data is merged correctly.

Sample templates are supplied with the Software and are in their own folder on the CD. The templates must be manually written to your hard drive. The subsequent sections tell you more about them.

Single-Run Graph

The Single-Run Graph template has custom titles and a graph of the merged data. The vertical axis of the graph is scaled to the range of the uploaded pressure values and the horizontal axis is scaled to the number of samples uploaded.

The template file name is:

700GTRACK-template-single-run-pressure-graph.xlt

For the Export options for this template, see Table 1.

Table 1. Single-Run Graph Template Export Options

Field	Include Field	Insert Description	Excel Cell
Run # or Label	Yes	No	B3
Gauge Description	Yes	No	B5
Log and Sample Type	Yes	No	B10
Interval Time	Yes	No	B12
Pressure Unit	Yes	No	B8
Custom Factor	Yes	Yes	B18
Trip Setpoint and Reset	Yes	Yes	B16
Initial Zero and Tare	Yes	Yes	B14
Zero Changes	Yes	No	J24
Temperature Readings	No	No	Any
Pressure Readings	Yes	No	B24

Single Run Pressure and Temperature Graph

The Single Run Pressure and Temperature Graph template has custom titles and a graph of the merged data. The pressure graph vertical axis is scaled to the range of the uploaded pressure values. The horizontal axis is scaled to the number of samples uploaded. The temperature graph vertical axis is scaled to the range of the uploaded temperature values. The horizontal axis is scaled to the number of samples uploaded.

The template file name is:

700G TRACK-template-single-run-pressure-temperature-graph.xlt

For the Export options for this template, see Table 2:

Table 2. Single Run Pressure and Temperature Graph Options

Field	Include Field	Insert Description	Excel Cell
Run # or Label	Yes	No	B3
Gauge Description	Yes	No	B5
Log and Sample Type	Yes	No	B10
Interval Time	Yes	No	B12
Pressure Unit	Yes	No	B8
Custom Factor	Yes	Yes	B18
Trip Setpoint and Reset	Yes	Yes	B16
Initial Zero and Tare	Yes	Yes	B14
Zero Changes	Yes	No	N44
Temperature Readings	Yes	No	I44
Pressure Readings	Yes	No	B24

Start Data Logging on Gauge

Set Download or Demand mode from the Software.

Download Mode

Download Mode shows "**LOG**" in the primary display and "**DATA**" in the secondary display. Push CONFIG to go to the current configuration functions, or push ENTER to go to the new data logging branch. The data logging configuration menu sequence (new branch) is:

1. Start or stop data logging
   - Primary display: **LOG**
   - Secondary display: **FULL** if the log memory is full, **OFF** if not logging data, or **ON** if logging data.
   - ▲ and ▼ are ignored if the log memory is **FULL**, otherwise push either button to toggle between **OFF** and **START** if not logging data, or to toggle between **ON** and **STOP** if logging data.
   - Push CONFIG to go to the next menu item.
   - Push ENTER to:
     - Exit configuration if the display shows **FULL**, **ON**, or **OFF**.
     - To stop logging and exit configuration if the display shows **STOP**.
     - To start logging and exit configuration if the display shows **START**.
2. Display number of free log records
   - Primary display: number of free records
   - Secondary display: **FREE**
   - ▲ and ▼ are ignored.
   - Push CONFIG to go to the next menu item if not logging, otherwise it exits configuration.
   - Push ENTER to exit configuration.
3. Erase all logged data and set to Demand mode.
   - Primary display: **CLEAr**
   - Secondary display: **DATA**
   - ▲ and ▼ are ignored.
   - Push ENTER to go to the next menu item and confirm erasure.
   - Push CONFIG to exit configuration without erasing the data.
4. Make sure that all logged data is erased and set to Demand mode.
   - Primary display: **CLEAr**
   - Secondary display: **CNFRM**

- ▲ and ▼ are ignored.
- Push ENTER to erase the data, set Demand mode, and exit configuration after the display briefly shows **CLr** to confirm erasure.
- Push CONFIG to exit configuration without erasing the data.

When not logging data, the Gauge works as given in the *700G Series Users Manual*.

When a log run is started, the pressure unit and custom factor are pushed to the downloaded selections. They are changed to their initial values at the end of the run.

While logging data, these changes occur:

- When ⏻ is pushed, the log run to be stops before power is turned off.
- Power off on low-battery detection stops the log run before power is turned off.
- ZERO is active and an event record (including the change in the zero offset value) is placed into the log.
- The gauge's Auto Off feature is disabled. It is changed to its initial value at the end of the run.
- Engineering units, damp, sample rate, tare, and custom factor functions on the current configuration menu are disabled.
- The units field on the display cycles between the units, the text **LOG**, and the text **RUN** at a rate of one time each second. This shows that data logging is on and the number after the text **RUN** shows the run number.

Demand Mode

You can make a data measurement/log without a computer. In Demand mode, a computer is not necessary to configure all of the logging parameters.

When data logging is active, a new item is added at the start of the configuration menu tree to point you to a different branch which contains all data logging functions. This new menu item shows "**LOG**" in the primary display and "**DATA**" in the secondary display. Push CONFIG to go to the current configuration functions, or push ENTER to go to the new data logging branch.

The data logging configuration menu sequence (new branch) is as follows:

1. Start or stop data logging
   - Primary display: **LOG**
   - Secondary display: **FULL** if the log memory is full, **OFF** if not logging data, or **ON** if logging data.
   - ▲ and ▼ are ignored if the log memory is **FULL**, otherwise push either button to go between **OFF**

and **START** if not logging data, or to go between **ON** and **STOP** if logging data.

- Push CONFIG to go to the next menu item.
- Push ENTER to:
  - Exit configuration if the display shows **FULL**, **ON**, or **OFF**.
  - To stop logging and exit configuration if the display shows **STOP**.
  - To start logging and exit configuration if the display shows **START**.

2. Display number of free log records
   - Primary display: number of free records.
   - Secondary display: **FREE**
   - ▲ and ▼ are ignored.
   - Push CONFIG to go to the next menu item if not logging, otherwise it exits configuration.
   - Push ENTER to exit configuration.
3. Select logging interval
   - Primary display: interval selection of 1, 2, 5, 10, or 30 for seconds, or 1, 2, 5, 10, or 30 for minutes, or 1 for hours.
   - Secondary display: time unit **SEC**, **MIN**, or **HOUR** as applicable for the selection.
   - Push ▼ to decrease the interval selection. Stop at 1 second.
   - Push ▲ to increase the interval selection. Stop at 1 hour.
   - Push CONFIG to go to the next menu item.
   - Push ENTER to exit configuration.
4. Select maximum number of samples
   - Main display: number of samples presently selected
   - Secondary display: **SAMPL**
   - Push ▼ to decrease the interval selection. Stop at 1.
   - Push ▲ to increase the interval selection. Stop at the maximum number of records (8500).
   - Push CONFIG to go to the next menu item.
   - Push ENTER to exit configuration.
5. Erase all logged data and set to Demand mode.
   - Primary display: **CLEAr**
   - Secondary display: **DATA**

- ▲ and ▼ are ignored.
- Push ENTER to go to the next menu item and confirm erasure.
- Push CONFIG to exit configuration without erasing the data.

6. Confirm erasure of all logged data and set to Demand mode.
   - Main display: **CLEAr**
   - Secondary display: **CNFRM**
   - ▲ and ▼ are ignored.
   - Push ENTER to erase the data, set Demand mode, and exit configuration after briefly displaying CLr to confirm erasure.
   - Push CONFIG to exit configuration. This will not erase the data.

While not logging data, the Gauge works as given in the *700G Series Users Manual*.

When a log run starts, the pressure unit and custom factor are left at the values set by the current configuration functions.

While logging data, these changes occur:

- Push ⏻ to stop the log run before power is turned off.
- Power off on low battery detection stops the log run before power is turned off.
- ZERO is active and an event record (including the change in the zero offset value) is recorded in the log.
- The Gauge's Auto off function is disabled. It is change to its original value at the end of the run.
- Engineering units, damp, sample rate, tare, and custom factor items on the existing configuration menu are disabled.
- The units field on the display goes between the units, the text **LOG**, and the text **RUN** at a rate of one time each second. This shows that data logging is on and the number after the text **RUN** identifies the run number.

Serial Interface Instructions

The subsequent sections tell you how to set up the Gauge for serial communication.

Initiating Communication

Terminal communication can be setup with terminal communication Software on a PC. The terminal must be set as follows:

- Bits per second: 9600
- Data bits: 8
- Parity: None
- Stop bits: 1
- Flow control: None
- Local echo on

List of Commands

Use the subsequent list of commands to communicate with the Gauge:

CAL_START	Puts the calibrator in calibration mode
*CLS	Clears the error queue
FAULT?	Returns an error code from the error queue
*IDN?	Identification query. Returns the manufacturer, model number, and firmware revision level of the Calibrator.
TARE	Tares the offset pressure of the reading on the calibrator
TARE?	Returns the current tare value
PRES_UNIT?	Returns the pressure unit for the upper display.
PRES_UNIT	Sets the pressure unit for the display
ZERO_MEAS	Zeros pressure of the calibrator
ZERO_MEAS?	Returns the current zero offset value
MINMAX_RST	Resets the minimum and maximum recorded values.
MIN?	Returns the minimum recorded value
MAX?	Returns the maximum recorded value
HC_OFF	Turns off unit
HC_DFLT	Sets auto off defaults
TEMP?	Returns temperature in the chosen units
HC_COMP_OFF	Turns off temperature compensation
HC_COMP_ON	Turns on temperature compensation on
HC_COMP?	Returns state of temperature compensation.
HC_RD_2410?	Return 2410 ADC counts.
HC_SI_OFF	Turns off SI mode
HC_SI_ON	Turns on SI mode
CAL_STORE	Stores calibration data.
HC_AUTO_OFF	Turns auto shutdown off
HC_AUTO_ON	Turns auto shutdown on

CUST_MULT?	Sets the multiplier for the custom unit type
STREAM_OFF	Turns off streaming data
STREAM_ON	Turns on streaming data
HC_TEMP?	Same as TEMP?
VAL?	Returns the measured pressure value in selected units
HC_CMD_LIST	Prints out a command list
TEMP_UNIT	Used to set temperature unit
TEMP_UNIT?	Returns temperature unit

Parameter Units

The subsequent list of units is used with the Gauge:

Psi	Pressure in pounds per square-inch
Bar	Pressure in bars
mBar	Pressure in millibars
Kg/cm2	Pressure in kilograms per centimeter squared
InH2O4C	Pressure in inches of water at 4 °C
InH2O20C	Pressure in inches of water at 20 °C
InH2O60F	Pressure in inches of water at 60 °F
mH2O4C	Pressure in meters of water at 4 °C
MH2O20C	Pressure in meters of water at 20 °C
cmH2O4C	Pressure in centimeters of water at 4 °C
cmH2O4C	Pressure in centimeters of water at 20 °C
ftH2O4C	Pressure in feet of water at 4 °C
ftH2O20C	Pressure in feet of water at 20 °C

ftH2O60F	Pressure in feet of water at 60 °F
Inhg0C	Pressure in inches of mercury at 0 °C
mmhg0C	Pressure in millimeters of mercury at 0 °C
kpal	Pressure in kilopascals
Far	Temperature in Fahrenheit
Cel	Temperature in Celsius

Error Codes

The gauge uses the subsequent error codes:

101	A non-numeric entry was received where it should be a numeric entry
102	Too many significant digits entered
103	Invalid units or parameter value received
105	Entry is above the upper limit of the allowable range
106	Entry is below the lower limit of the allowable range
108	A required command parameter was missing
109	An invalid pressure unit was received
117	An unknown command was received
120	The serial input buffer overflowed
121	Too many entries in the command line
122	Pressure module not connected