+ Scanner 3100 Flow Computer Logging and Data Acquisition Applications

How It Works

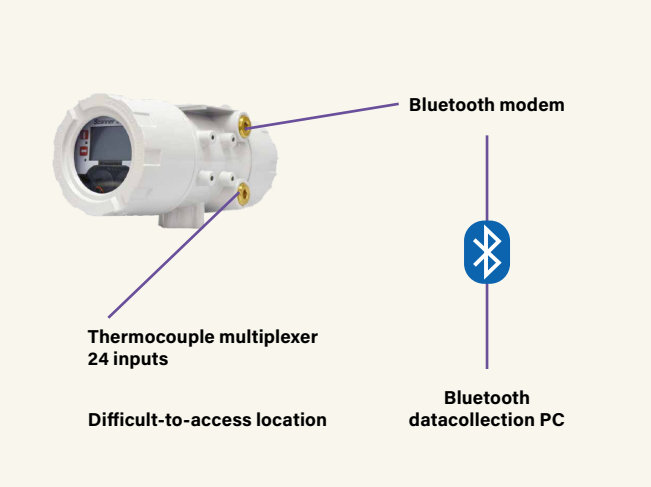
The Sensia Scanner* 3100 flow computer is a cost-effective highperformance data logger and remote terminal unit (RTU) that records detailed flow data and has the capacity to collect and store vast amounts of other data that is beneficial to many industries and applications.

A single Scanner 3100 flow computer can continuously acquire and log information from up to 135 different sources. Digital data can be acquired over wired or wireless connections or by a traditional analog-wired connection. Other data may be calculated internally.

Possible data sources include

+ two resistance temperature detector sensors
+ three amplified DC or mVAC frequencies
+ four analog input signals in format combinations of 4–20 mA, 1–5 VDC, or 0–5 VDC (in some applications, a direct thermocouple input may also be accommodated)
+ one integral sensor measuring differential and absolute pressure
+ 384 information sources from serial communication devices
+ 20 remote Scanner 2000 flow computer sensor groups, each measuring differential pressure, absolute pressure, temperature, and a mVAC frequency. These sensors can be wirelessly linked or connected by RS-485. When connected by RS-485, each sensor group may also include
  - two analog inputs plus another AC frequency or pulse input
  - one integral sensor measuring ambient (internal) temperature.
+ Popular wireless formats, including HART® and ISA 100† are supported through a base station radio that communicates to the Scanner 3100 flow computer by Modbus® protocol formats and Ethernet, RS-232, or RS-485 communications. All wired data are gathered using the same diverse range of Modbus protocol and communication ports.

In response to a customer's request for automation support, Sensia recently applied the Scanner 3100 flow computer Modbus master capability to sense 24 thermocouple-based temperature measurements, which were then logged to monitor conditions on a large compressor.



The Scanner 3100 flow computer is designed to present data in formats and terms that match a user's specific requirements. The Scanner 3100 flow computer can acquire and log measurements that represent:

- pressure
- differential pressure
- temperature
- length (depth or level)
- viscosity
- density
- gas volume
- liquid volume
- mass
- energy
- heating value
- thermal expansion
- volts
- amps
- power
- resistance
- frequency
- factor
- time
- date
- percent
- fraction

Scanner flow computer customers have the added flexibility of specifying how data is to be logged and how frequently it is to be logged. For example, level can be logged as depth (length), percent full, percent empty, or liquid volume. Where applicable, the user can select the required units of measurement. Logging frequency selections range from once per second to once per day. For each interval, the minimum, maximum, average, or instantaneous value can be recorded.

Because the total archive capacity is distributed between two flow archive repositories, a user can log a single variable two ways—for example, as a daily average and as an instantaneous value logged once per minute. Within each group, all values for selected variables (58 variables maximum per group) must be logged at the same interval, but each variable can be independently configured for logging a minimum, maximum, or average value. In total, nearly 688,000 records can be stored in the Scanner 3100 flow computer. All collected values include the time and date. For most data points, input data quality can be detected to alert the user to unusual conditions.

In addition to the flow archives described above, a third log can be used to simultaneously record data after an event or "trigger." This "triggered" log can be configured to activate when the following conditions or events occur:

- at a specified time and date
- when a process value exceeds a user-specified minimum or maximum value
- when a switch input occurs.

The duration of the triggered log is also configurable. A triggered log can

- continue forever, overwriting the oldest data when memory capacity is reached
- stop when the memory capacity is reached
- stop at a specified time
- stop when the process value no longer exceeds the minimum or maximum value.

Up to 19 variables can be allocated to the triggered log and, like the flow archives, each variable can be independently configured for logging a minimum, maximum, average, or instantaneous value; memory capacity for this log is 1.3 million records.

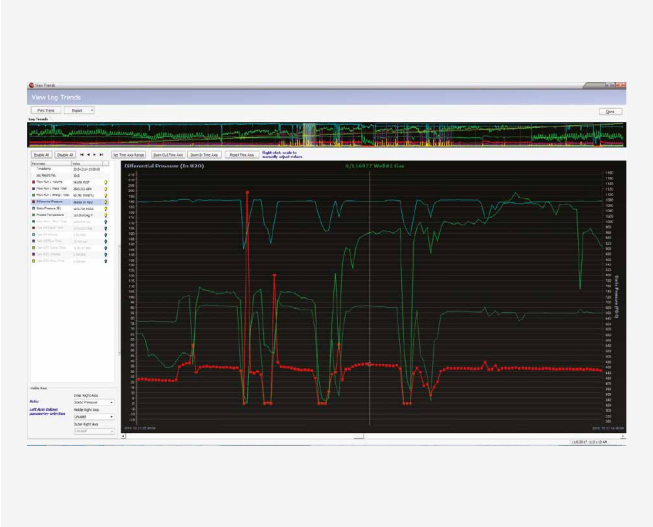
Where fast logging is required, the Scanner 3100 flow computer can be configured to simultaneously sample up to nine inputs at a frequency of 10 times per second and log the averages of those inputs once per second, setting a high bar for accuracy.

Viewing log data

After the information is acquired, data for up to 32 items can be viewed sequentially on the local Scanner 3100 flow computer LCD display in groups of four or five items.

Any value can be measured against an alarm threshold, ensuring that exceptions occurring during the log interval are marked in the log. Individual alarms or groups of alarms can be directed to trigger up to six switch outputs supported by the Scanner 3100 flow computer.

Data history records can be viewed on a computer screen by connecting to the Scanner 3100 with a smart device that has a web browser application. More commonly, the data is downloaded to a computer so that it can be reported numerically and graphically from the Sensia Scanner Data Manager* analysis and reporting software supplied with a Scanner 3100 purchase. This software also provides multiple data export formats and customizable reports. See the Scanner Data Manager software data sheet for more details.



Data may be transferred from the Scanner 3100 flow computer to the PC by an Ethernet connection to a PC operating an FTP client or a browser application. In addition, WiFi, cellular communication, or other wireless methods can support remote data collection.