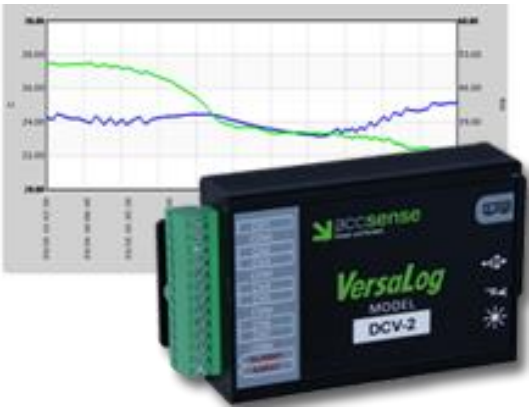
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VersaLog

Multi-Channel Data Loggers



User's Manual

Accsense VersaLog

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About this Manual

This manual contains operational information for Accsense VersaLog Data Loggers. Please read this manual before using the data loggers.

Limits of Liability and Disclaimer of Warranty:

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Rev 2.4 For Accsense Site View 3.3.4. Feb. 2018

Conditions of Sale and Product Warranty

Accsense VersaLog and the Buyer agree to the following terms and conditions of Sale and Purchase:

1. Limited Warranty.
   ACCSENSE VERSALOG warrants its product(s) to be free from defects in materials and workmanship for a period of one year from the date of registered purchase. Any unit which is found to be defective will, at the discretion of ACCSENSE VERSALOG, be repaired or replaced.

   ACCSENSE VERSALOG will not be responsible for the repair or replacement of any unit damaged by user modification, negligence, abuse, improper installation, or mishandling.

   ACCSENSE VERSALOG reserves the right to alter any feature or specification at any time.

2. Limitation of Liability.
   The product must NOT be used in applications where failure of the product could lead to physical harm or loss of human life. Buyer is responsible to conduct their own tests to meet the safety regulation of their respective industry.

   IN NO EVENT WILL ACCSENSE VERSALOG BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, CONSEQUENTIAL OR PUNITIVE DAMAGES FOR USE OF THE PRODUCT, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR REVENUES, COSTS OF REPLACEMENT, BUSINESS INTERRUPTIONS, LOSS OF DATA OR DAMAGES RESULTING FROM USE OF OR RELIANCE ON THE PRODUCT, EVEN IF ACCSENSE VERSALOG IS EXPRESSLY ADVISED ABOUT THE POSSIBILITY OF SUCH DAMAGES.

3. Extended Warranty.
   Extended 2-year warranty service is available to purchase on new products at time of order entry and up to ninety days thereafter. The extended warranty protects you from unbudgeted service expenses and provide additional 2 years of protection at a fraction of the price of a repair.

4. Return Policy.
   Defective Product Return:
   A Buyer may return a defective product to ACCSENSE VERSALOG for repair or replacement, at ACCSENSE VERSALOG option, in the event ACCSENSE VERSALOG determines that the product is defective. The defective product must be returned to ACCSENSE VERSALOG within the warranty period. The Buyer shall be responsible for all shipping costs. Repaired or replaced products are warranted for the balance of the original warranty period, or at least 90 days.

   Non-defective Product Return:
   Products that are not defective may be returned to ACCSENSE VERSALOG within 30 days from the date of shipment. All non-defective product returns are subject to a 20% restocking fee. If the product is unsatisfactory for the application for which it was purchased, ACCSENSE VERSALOG shall, at its option, either refund the purchase price paid by the Buyer or replace the product with one that is satisfactory for the application. The Buyer shall be responsible for all shipping costs and restocking fee determined by ACCSENSE VERSALOG.

   Method of Return:
   Prior to returning the product, completely fill out the RMA Application Form, send it to ACCSENSE VERSALOG or contact ACCSENSE VERSALOG directly for a Return Material Authorization number. All products returned to ACCSENSE VERSALOG must be securely packaged in the original shipping materials and reach ACCSENSE VERSALOG without damage and shipped in accordance with Applicable laws, rules, and regulations. The products must contain all software and accessories that were shipped to the Buyer in connection with the product.

5. ACCSENSE VERSALOG reserves the right to alter any feature or specification at any time.

Notes to Buyer:
If you disagree with any of the above terms or conditions you should promptly return the unit to the manufacturer or distributor within 30 days from date of purchase.

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1. Introduction

1.1 Features of the logger

Congratulations on purchasing the Accsense VersaLog series data loggers! These portable battery powered data loggers allow recording information and saving measurements to a 4MB flash memory for later retrieval.

The internal lithium battery provides up to 10 years of instantaneous logging operation when sampling at interval of one minute.

Accsense VersaLog data logger can be manipulated by VersaLog SiteView Windows software for data downloading, logging management, and property configuration. It has both TTL-compatible serial port and USB interface for different communications requirements.

Accsense VersaLog data loggers feature a wide sampling interval range from 20 milliseconds to 12 hours, providing an alternative to data acquisition devices and paper chart recorders.

Accsense VersaLog data loggers provide alarm outputs controlled by the low and high programmable alarm thresholds of each enabled channel. The alarm control outputs can be used to turn on/off external alarm devices such as strobe lights, sirens or alarm telephone diallers.

Accsense VersaLog data loggers also have an excitation control output used to switch the power supply of the external transducer/transmitter.

Accsense VersaLog data loggers contain one internal thermistor channel, and seven external process signal channels. The 16-bit analog-to-digital converter makes the measurements more precise and accurate.

Accsense VersaLog data loggers also have a rugged, splash-resistant aluminum enclosure, and internal electronics are protected against moisture ingress by conformal coating.

1.2 Approvals

CE

All Accsense VersaLog Series data loggers are in conformity with the EN standard(s) listed below:

- ☑ **EN 61000-6-2:[2005]**
  General standards – Immunity for industrial environments

☑ **EN 61000-6-3:[2007]**
General standards – Emission standard for residential, commercial and light-industrial environments

following the provisions of the following directive(s)

☑ **2004/108/EC** **Electromagnetic compatibility (EMC)**



All Accsense VersaLog Series data loggers comply with Part15 of the FCC Rules. Operation is subject to the following two conditions:

1. These devices may not cause harmful interference, and
2. These devices must accept any interference received, including interference that may cause undesired operation.

1.3 Care of the logger

Although the Accsense VersaLog data loggers are weather resistant, the loggers are designed to work in humid atmospheres of up to 95% RH non-condensing. They should be protected against immersion. The environment temperature should be within – 40 to +70°C (-40 to + 158°F).

1.4 Identity of the logger

Each logger has its own unique serial number, which can be found on the back of the enclosure. The serial number is used to identify the logger and enable us to keep a record of its history like calibrations and warranty. Please reference it in any correspondence with ACCSENSE VERSALOG.

1.5 Battery

The battery lasts in excess of 10 years when sampling at 1-minute intervals. When the battery is nearing the end of its service life, the on-board status LED will glow in amber each time the logger is sampling the data. The battery indicator on the status window in VersaLog SiteView software will also display warning of low battery level. The battery operates approximately one or two weeks from the time the logger first indicates a low battery, but we recommend that the battery be changed as soon as the warning is displayed. The battery is factory replaceable only.

1.6 Recalibration

Any Accsense VersaLog data logger is supplied with all channels pre-calibrated and should not require any further recalibration for a period of 12 months.

We recommend the logger be recalibrated every year. You may recalibrate the logger longer than a year depending on your application standard.

You may return the logger to the supplier for recalibration service or recalibrate it on your own via VersaLog SiteView software.

VersaLog SiteView software provides two-point calibration for the most of the loggers.

1.7 Safety Warning

Maximum Input Voltage Range

For logger model: VL-DCV-2, VL-DCVC-HR, VL-TH, VL-TC:
The logger is designed to measure single common ground DC voltages in the range up to 20 VDC. Any voltages over this range may cause permanent damage to the device.

Maximum Input Current Range

For logger model: VL-DCC-HR, VL-DCVC-HR:
The logger is designed to measure single common ground DC current in the range up to 50 mA. Any current over this range may cause permanent damage to the device.

External Power Supply
When using external power supply (via USB, Serial Port, Device Server, or thirty party +5 VDC power supply) to power the logger please make sure that the external power supply has the same common ground with the external input process signals.

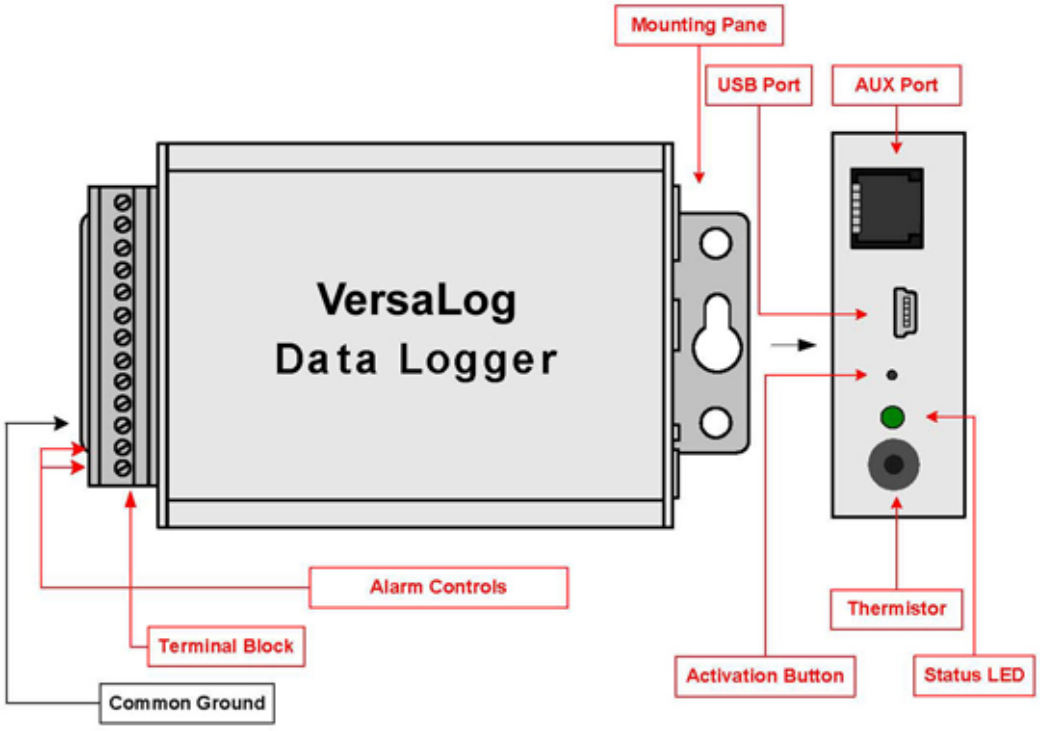
When using other third party external power supplies, please make sure the voltage of the external power supply is +5 VDC (+/- 5% ripple).

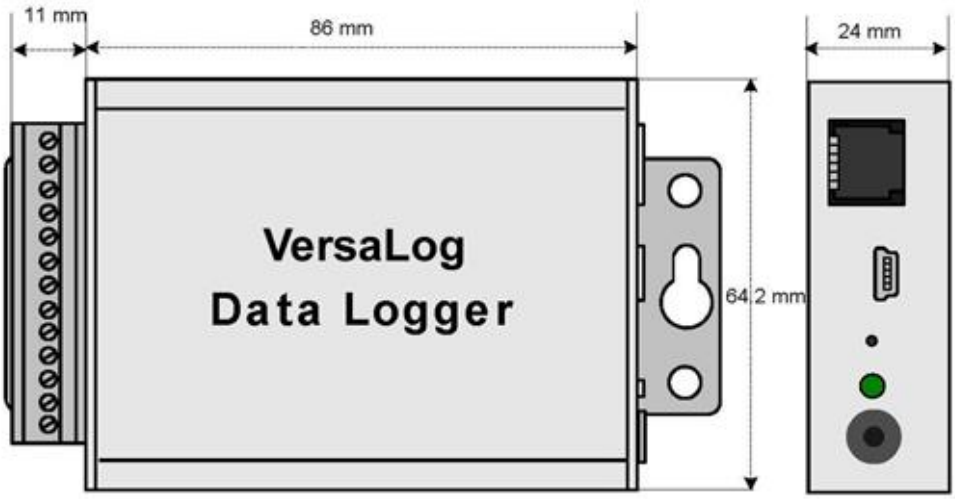
Grounding
The common ground of the Accsense VersaLog data logger is connected directly to the ground of the input process signals and the ground of the external power supply (if applicable).

2. Hardware & Mechanical Dimension

Logger Diagram:

For Model VL-DCV-2, VL-DCC-HR, VL-DCVC-HR, VL-TC, VL-TH:





Dimension: 88 X 64.2 X 24 MM
3.46 X 2.53 X 0.95 Inches

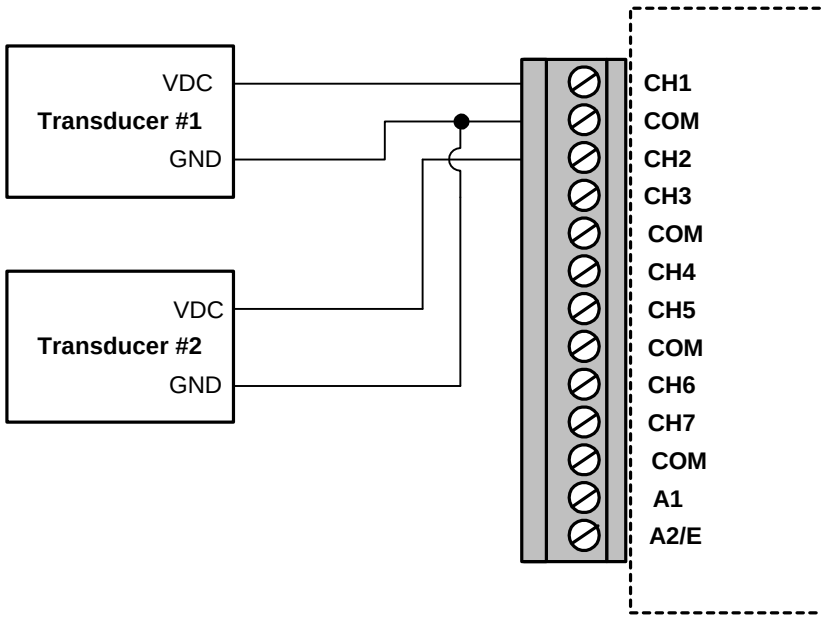
3. Channels and Sensor connections

All Accsense VersaLog data loggers have one on-board thermistor located beside the status LED.

All "COM" terminals are connected together and should be connected to the common ground of the process signals.

VL-DCV-2 – Voltage Inputs, Programmable Range

Besides the on-board thermistor channel, the VL-DCV-2 logger has seven external voltage DC channels used to measure single-ended voltage DC signals maximum of 20 volt. The following figure illustrates the correct input connections:



Voltage External Input Connections

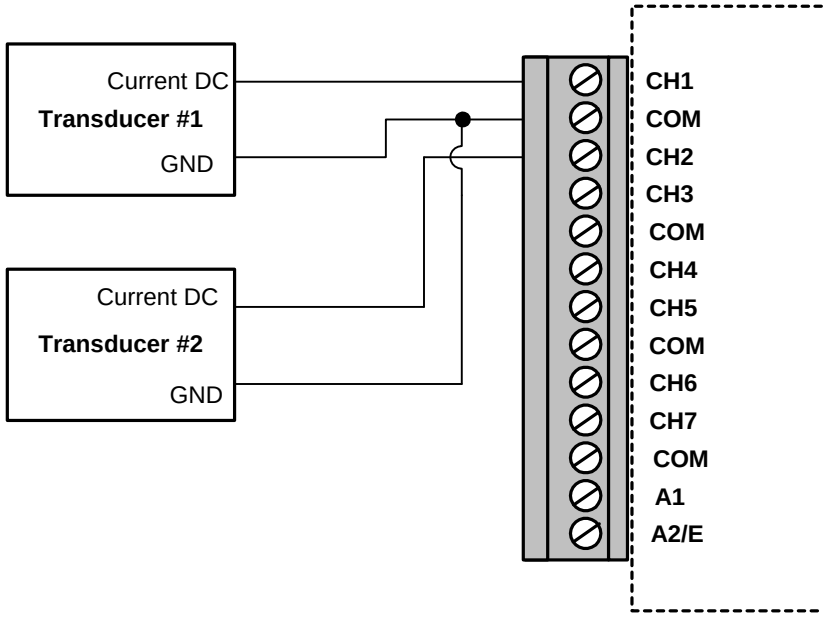
Note: All inputs must share the same common ground.

Channel and Sensor Specifications:

Connections	Pluggable terminal block for 7 external channels, excitation controls and alarm outputs.
Channels	One on board thermistor temperature (-40°C ~ 70°C, -40°F ~ 158°F). Seven external Voltage DC. Software programmable input range selections for each channel: 0 ~ 20 V, -5 ~ +5 V
Resolution	0.0018%
Accuracy	Thermistor channel: +/-0.2°C (0°c ~ 70°C, 32°F ~ 158°F) +/-0.05% FSR @ 25°C
Input Impedance	> 1 MOhms
Over-voltage protection	+/- 40 VDC

VL-DCC-HR – Current Inputs

Besides the on-board thermistor channel, VL-DCC-HR logger has seven external current DC channels used to measure single-ended current DC signals maximum of 20 mA. The following figure illustrates the correct input connections:



Current External Input Connections

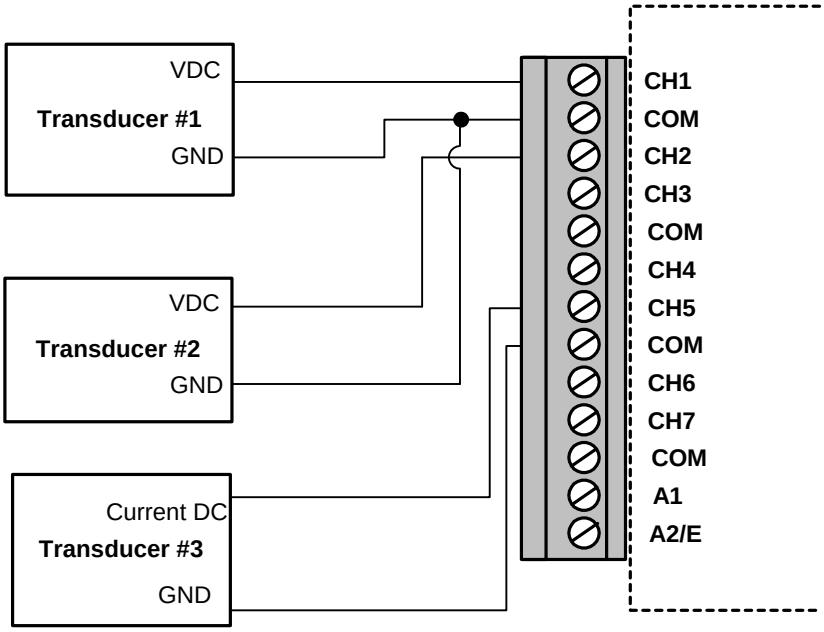
Note: All inputs must share the same common ground.

Channel and Sensor Specifications:

Connections	Pluggable terminal block for seven external channels, excitation controls and alarm outputs
Channels	One on-board thermistor temperature (-40°C ~ 70°C, -40°F ~ 158°F). Seven external Current DC inputs: 0 ~ 20 mA
Resolution	0.0018%
Accuracy	Thermistor channel: +/- 0.2°C(0°C ~ 70°C, 32°F ~ 158°F) Current channels: +/- 0.1% FSR @ 25°C
Load Resistor	12 Ohms
Over-current protection	+/- 100 mA

VL-DCVC-HR – Voltage & Current Inputs, Range Programmable

Besides the on-board thermistor channel, the VL-DCVC-HR logger has seven external voltage and current channels. The first four external channels are used to measure single-ended voltage maximum of 20 VDC and the remaining three external channels are used to measure single-ended current DC signals maximum of 20 mA. The following figure illustrates the correct input connections:



Voltage and Current External Input Connections

Note: All inputs must share the same common ground.

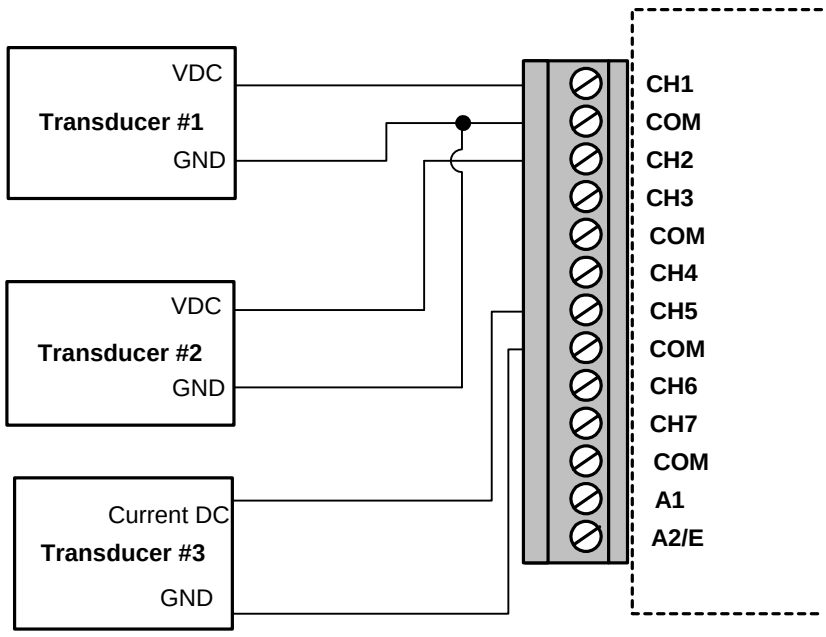
Channel and Sensor Specifications:

Channels	CH1 ~ CH4 (voltage): programmable range for each channel: 0 ~ 20 V, 0 ~ 2 V. CH5 ~ CH7 (current) programmable range for each channel: 0 ~ 20 mA.
Accuracy	Reference Temperature : 0.36°F Voltage channels: +/- 0.05% FSR @ 25°C for 20V channels +/- 0.1% FSR @ 25°C for 2V channels Current channels: +/- 0.15% FSR @ 25°C
Load Resistor	For current channel: 12 Ohms
Protection	Voltage channel: +/- 40 VDC Current channel: +/-100 mA

VL-DCVC – Voltage & Current Inputs, Range Programmable

Besides the on-board thermistor channel, the VL-DCVC logger has seven external voltage and current channels. The first four external channels are used to measure single-ended voltage maximum of 20 VDC and the remaining three external channels are used to measure single-

ended current DC signals maximum of 20 mA. The following figure illustrates the correct input connections:



Voltage and Current External Input Connections

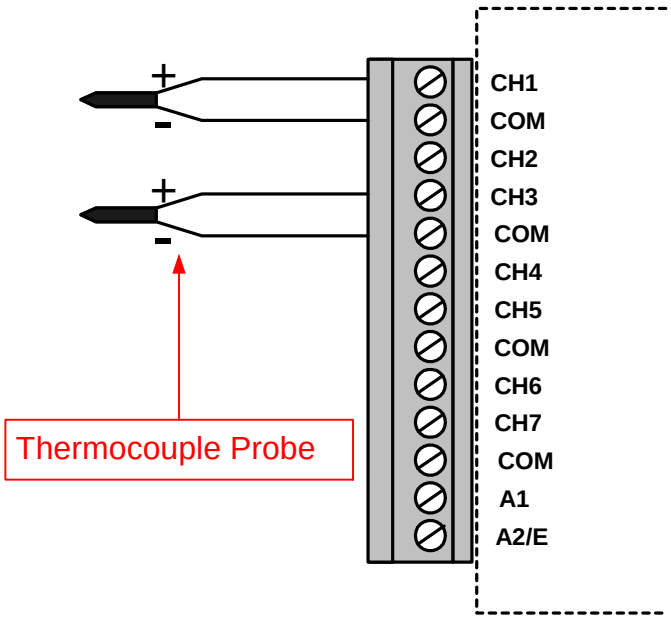
Note: All inputs must share the same common ground.

Channel and Sensor Specifications:

Channels	CH1 ~ CH4 (voltage): programmable range for each channel: 0 ~ 20 V, 0 ~ 2 V. CH5 ~ CH7 (current) programmable range for each channel: 0 ~ 20 mA.
Accuracy	Reference Temperature : 0.36°F Voltage channels: +/- 0.15% FSR @ 25°C from 0.1 V and up +/- 0.5% FSR @ 25°C from 0 to 0.1 V Current channels: +/- 0.15% FSR @ 25°C from 2.5 mA and up +/- 0.5% FSR @ 25°C from 0 to 2.5 mA
Load Resistor	For current channel: 12 Ohms
Protection	Voltage channel: -3VDC - 40 VDC Current channel: +/-100 mA

VL-TC – Thermocouple Inputs, Range Programmable

Besides the on-board thermistor channel, the VL-TC logger has seven external voltage DC channels used to measure thermocouple probes or small voltage signals. The following figure illustrates the correct input connections:



Thermocouple Input Connections

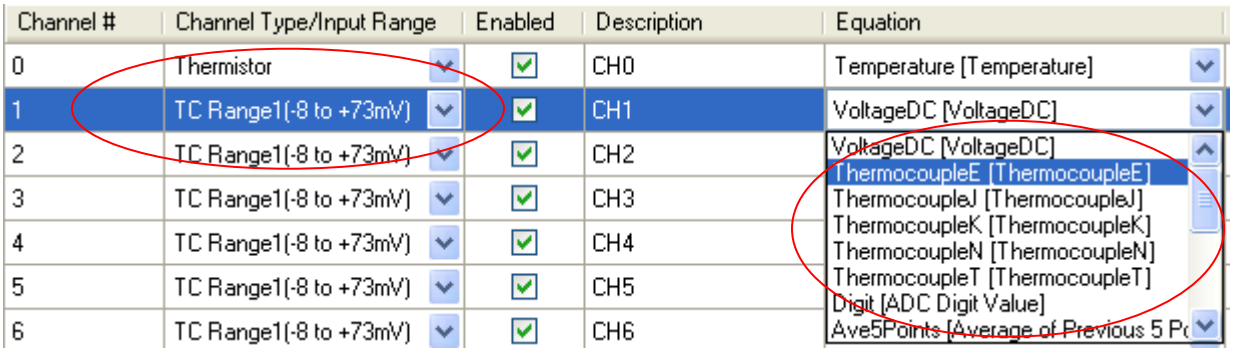
Note: All inputs must share the same common ground.

Channel and Sensor Specifications:

Channels	One on-board thermistor reference temperature (-40°F ~ 158°F). Seven external thermocouple inputs. Type: E, N, J, K, T Software programmable input range selections for each channel
Accuracy	Reference Temperature : 0.36°F Thermocouple Inputs: +/- 0.2% + T/C Accuracy @ 25°C
Over-voltage protection	+/- 40 VDC

Measure Temperature:

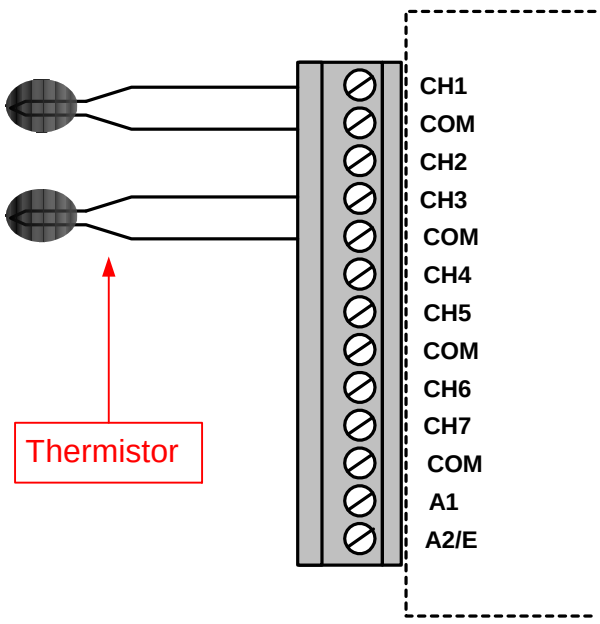
Based on the thermocouple type you want to use and the desired temperature range you want to measure you can select one of four channel's available ranges and the correct factory thermocouple equation:



For detailed temperature range and voltage – temperature look-up table of a specific thermocouple type please refer to NIST's website at:
http://srdata.nist.gov/its90/download/download.html

VL-TH – Thermistor / Resistor Inputs

Besides the on-board thermistor channel, the VL-TH logger has seven external channels used to measure the external thermistors or resistors. The following figure illustrates the correct input connections:



Thermistor External Input Connections

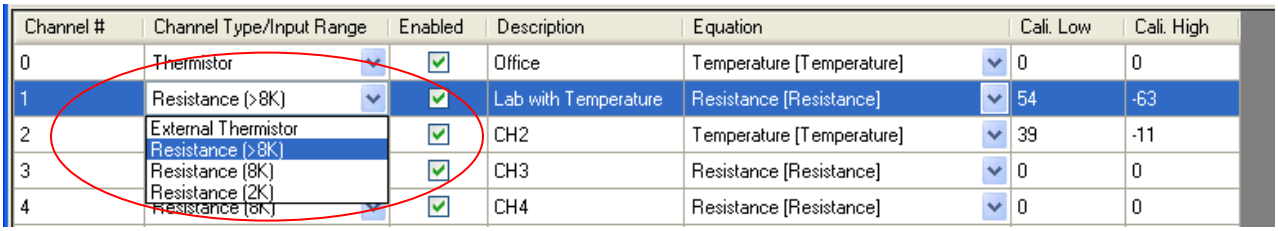
Note: All inputs must share the same common ground.

Channel and Sensor Specifications:

Connections	Pluggable terminal block for seven external channels, excitation controls and alarm outputs.
Channels	One on-board thermistor temperature (-40°C ~ 70°C, -40°F ~ 158°F). Seven external thermistor channels for 10K thermistors
Accuracy	Internal thermistor channel: +/- 0.2°C(0°C ~ 70°C, 32°F ~ 158°F) External thermistor channels: +/- 0.2% FSR @ 25°

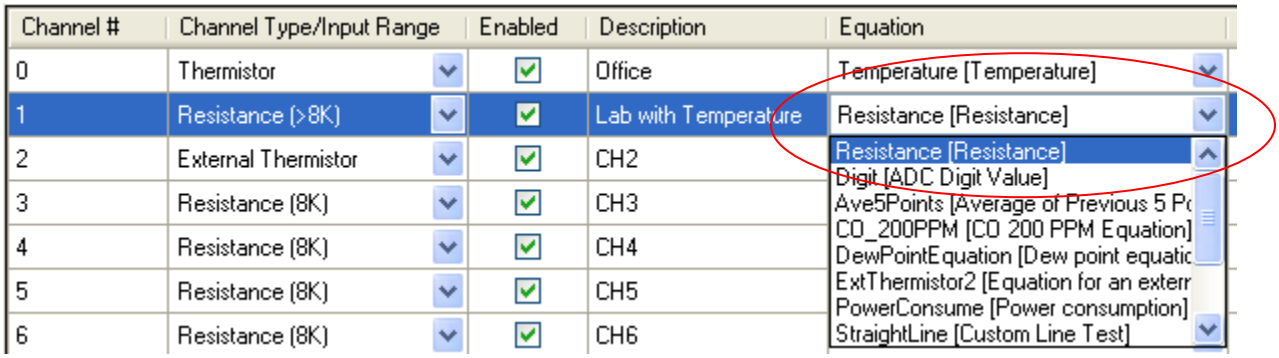
Measure Resistance:

Accsense VersaLog provides factory resistance equation for measuring the resistor's value. Based on the range you want to measure you can select either >8 Kohms, between 2 and 8 Kohms or from zero to 2 Kohms. In Configuration dialog:



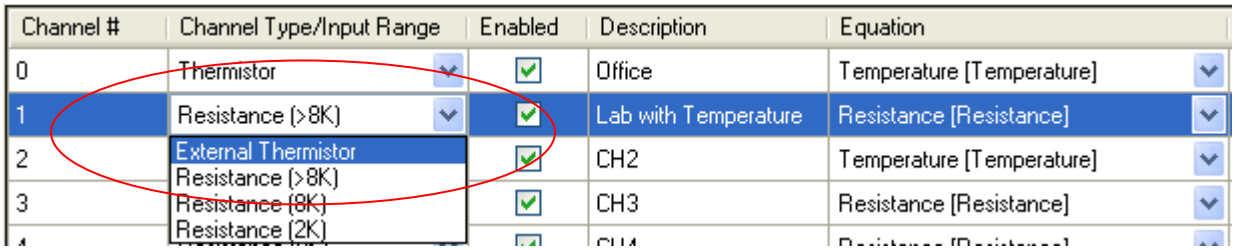
Change Channel Type/Input Range to the one best fits your measuring range.

Once you selected the right range you choose Resistance equation:

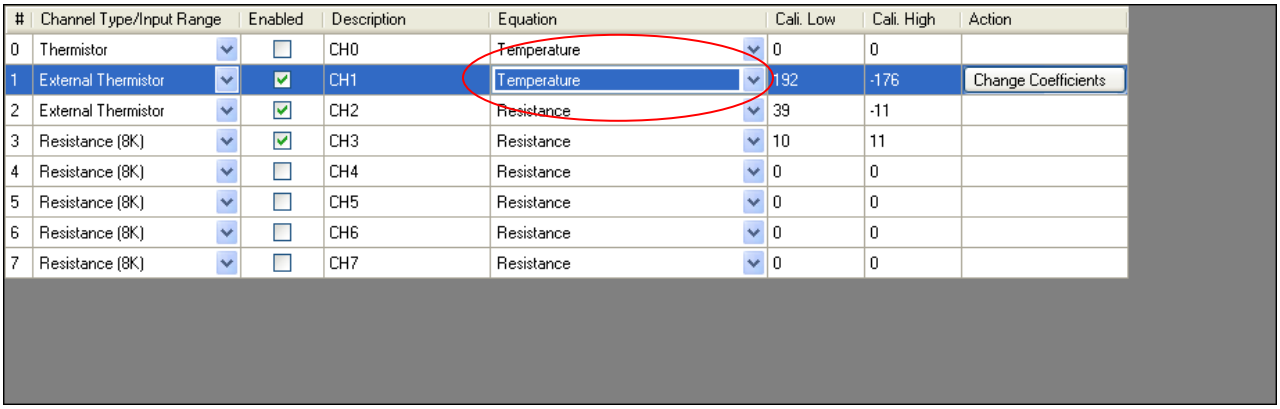


Measure Temperature:

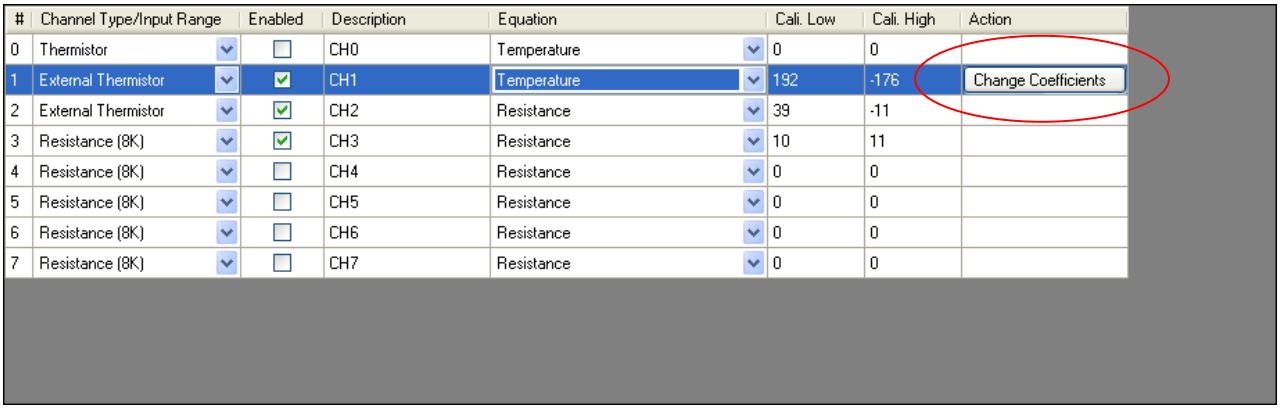
To measure temperature of an external thermistor, you need to change the channel type to External Thermistor:



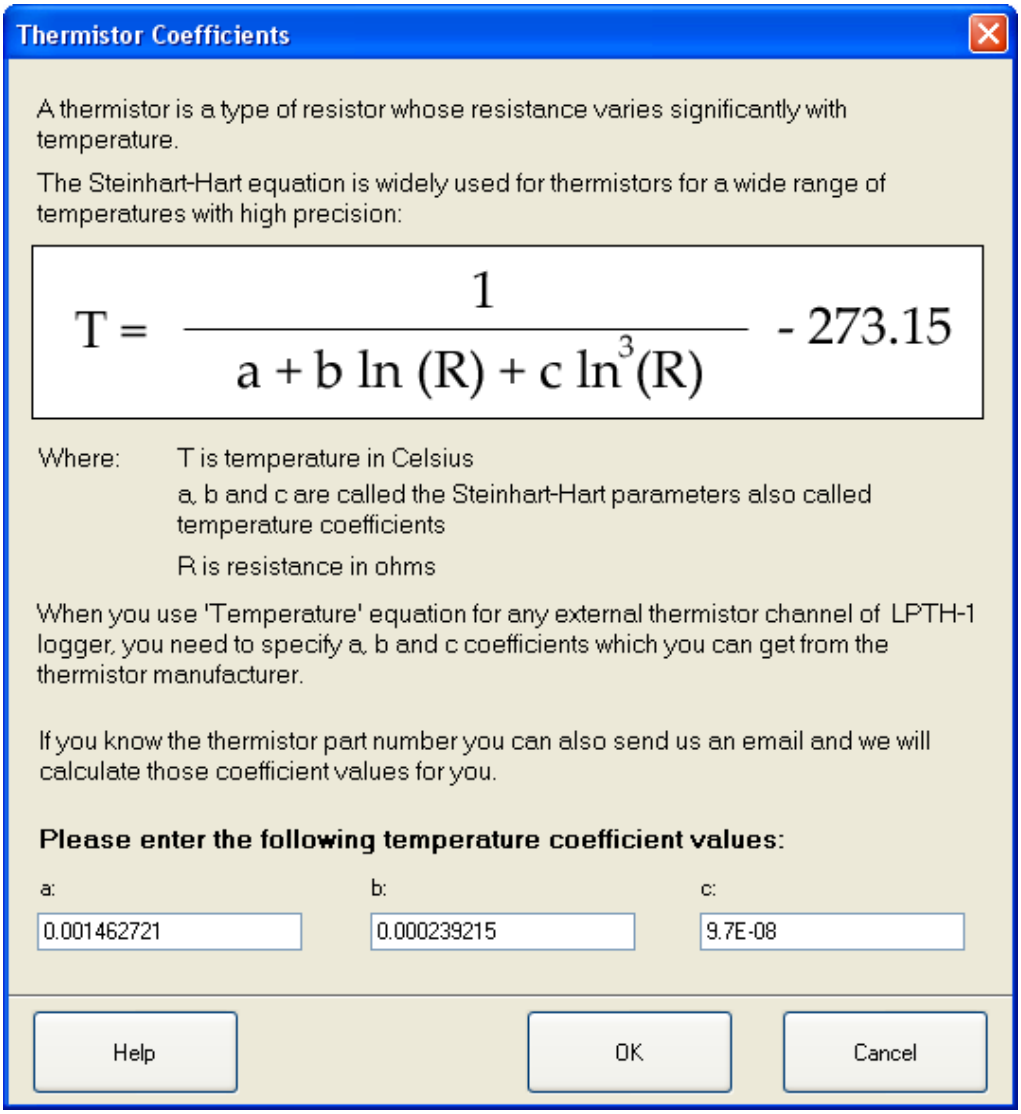
The simple way to measure temperature is by using built-in "Temperature" equation. You select "Temperature" in "Equation" column:



Then you need to change temperature coefficient values by clicking "Change Coefficients" button in "Action" column:



In the pop-up dialog enter new temperature coefficient values and click "OK" button.



You can also use a custom equation to do the same job or even more complicated calculation. An example of external thermistor equation is included in the Accsense VersaLog package. When you create your own equation you can refer to this equation and replace those temperature coefficients with the ones obtained from the thermistor manufacturer. The contents of the sample equation looks like this:

```
1
2
3  //An example for external thermistor channel.
4  //You may change a,b and c values based on the thermistor spec
5  //Value 'Input' is resistance value
6  public double ExtThermistor2(double Input)
7  {
8
9      double a, b, c, lgr, Output;
10     //different thermistor will have different a, b, c values
11     a = 0.001028444;;
12     b = 0.000239244;
13     c = 0.000000156;
14
15     //validation
16     if(Input <= 0)
17         Input = 1;
18     //===========
19     lgr = Math.Log(Input);
20
21       Output = 1f / (a + b * lgr + c * lgr * lgr * lgr) - 273.15f;
22
23       return Output;
24
25 }
26
```

Once you have created your equation (for example YSI2252(YSI thermistor 44004)), you can apply it to the channel:

Channel #	Channel Type/Input Range	Enabled	Description	Equation
0	Thermistor	☑	Office	Temperature [Temperature]
1	External Thermistor	☑	Lab with Temperature	Thermistor103J2 [Mytest]
2	External Thermistor	☑	CH2	
3	Resistance (8K)	☑	CH3	
4	Resistance (8K)	☑	CH4	
5	Resistance (8K)	☑	CH5	
6	Resistance (8K)	☑	CH6	

DewPointEquation [Dew point equatic
ExtThermistor2 [Equation for an exterr
PowerConsume [Power consumption]
StraightLine [Custom Line Test]
StrightLineLow [Low Temp]
testTemp [Test]
Thermistor103J2 [Mytest]
YSI2252 [YSI thermistor 44004]

VL-BR-- EXCITATION/SENSE INPUT, VOLTAGE INPUT, FIXED RANGE

The VL-BR is a single channel, battery powered, stand-alone strain gauge bridge data logger. It supports 4/6 wheatstone bridges by providing voltage excitation, excitation voltage compensation and low level signal amplification.

What is a Strain Gauge

A strain gauge (also strain gage) is a device used to measure the strain of an object.
The gauge is attached to the object by a suitable adhesive. As the object is deformed, the foil is deformed, causing its electrical resistance to change. This resistance change, usually measured using a Wheatstone bridge, is related to the strain by the quantity known as the gauge factor.
The gauge factor GF is defined as:

$$GF = \frac{\Delta R/R_G}{\epsilon}$$

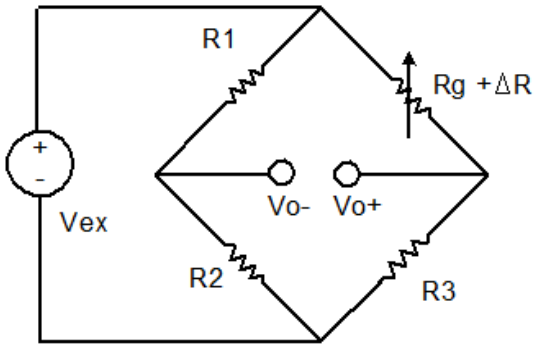
where

ΔR is the change in resistance caused by strain,
R_G is the resistance of the undeformed gauge, and
ϵ is strain.

A Wheatstone bridge is an electrical circuit used to measure an unknown electrical resistance by balancing two legs of a bridge circuit. The Wheatstone bridge consists of four resistances (R1, R2, R3 and R4), an excitation voltage and an output voltage. Generally, one or more of the resistances are variable and change in accordance with some physical phenomenon, such as strain in this case. The Wheatstone bridge then converts this change in resistance to a change in voltage.
There are 3 configurations are used - quarter bridge, half bridge or full bridge.

Quarter Bridge Circuit:

Only one active strain gauge (Rg) is used as shown below. R3 is the inactive gauge, which is identical to the active gauge but does not encounter any mechanical strains and is used for compensating the temperature effect. The other two arms contain fixed resistors.

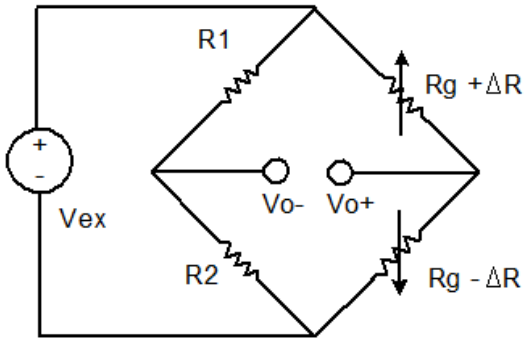


F1. Quarter Bridge

Half Bridge Circuit:

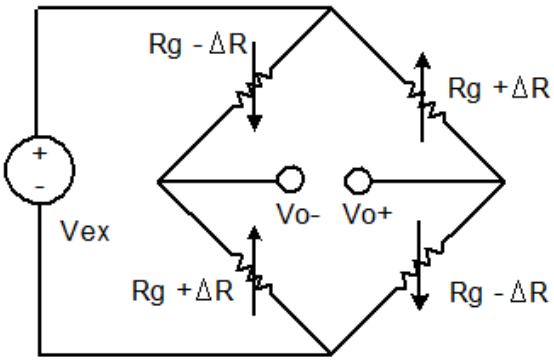
If the dummy gauge in the above figure is replaced by an active gauge, as shown below, the resulting arrangement is called a half bridge. The half bridge has advantages for temperature

compensation and higher bridge sensitivity over the quarter bridge so that small strain levels can be detected more accurately.



F2. Half Bridge

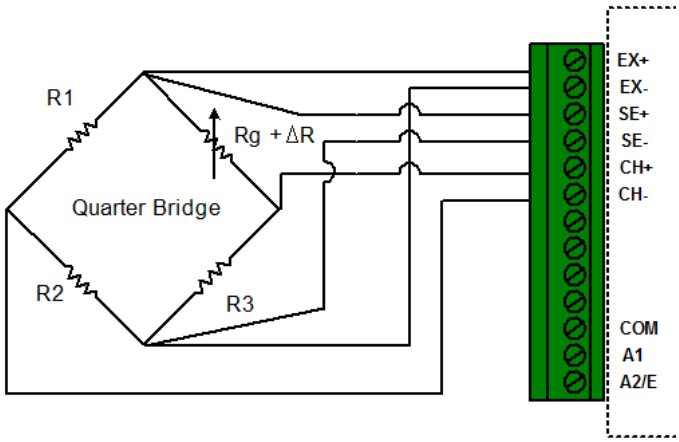
Full Bridge Circuit:
If four active gauges are employed in the circuit, the arrangement is called Full Bridge as shown below. It is automatically temperature compensated when all four active gauges bonded on the same material, and the highest sensitivity is obtained.



F3. Full Bridge

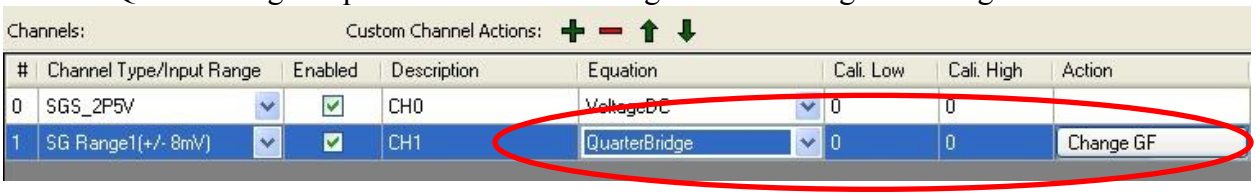
Connect Strain Gauge to a Data Logger
iLog Srtrain Gauge/Bridge data logger supports six-wire configuration when connecting to a wheatstone bridge circuit. The following wirings are for SiteView built-in Strain Gauge equations:

Wiring for Quarter Bridge Circuit:

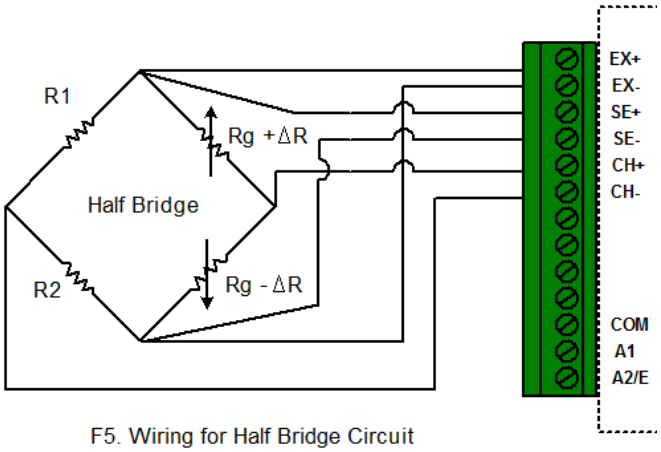


F4. Wiring for Quarter Bridge Circuit

This circuit is for equation "QuarterBridge". When configure the logger, choose "QuarterBridge" equation and click "Change GF" to change the Gauge Factor.



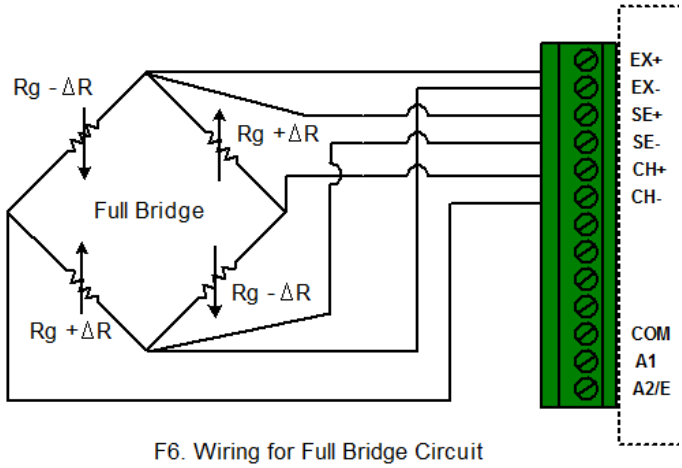
Wiring for Half Bridge Circuit:



F5. Wiring for Half Bridge Circuit

This circuit is for equation "HalfBridge". When configure the logger, choose "HalfBridge" equation and click "Change GF" to change the Gauge Factor.

Wiring for Full Bridge Circuit:



F6. Wiring for Full Bridge Circuit

This circuit is for equation "FullBridge". When configure the logger, choose "FullBridge" equation and click "Change GF" to change the Gauge Factor.

Other Bridge Circuit:

If your bridge circuit is not included in the above configurations, you may need to write your own equation. SiteView includes a custom equation "BridgeSample" for your reference. The source code looks like:

```
// Sample Equation for iLog Strain Gauge/Bridge
public double SampleBridge(double Input)
{
        //Change it according to your curcuit
        double GF = 1;//Gauge Factor
        //The voltage of the bridge output
        double Vo = Input;
        //The voltage of the Excitation sense channel
        double Vex = Channels[0].Measurement;

        /* this block is for half bridge circuit
        double strain = -2 * Vo / (Vex * GF);
        return strain;
        */
        /* this block is for full bridge circuit
        double strain = -Vo / (Vex * GF);
        return strain;
        */
        /* this block is for quarter bridge circuit */
        double strain = -4 * Vo / ((2 * Vo + Vex) * GF);
        return strain;

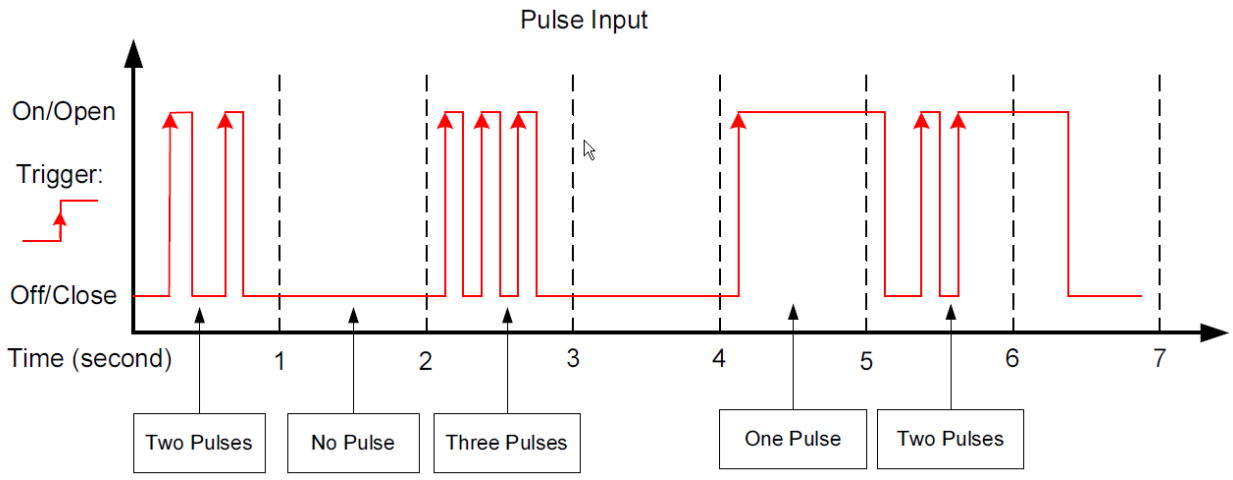
}
```

Channel and Sensor Specifications:

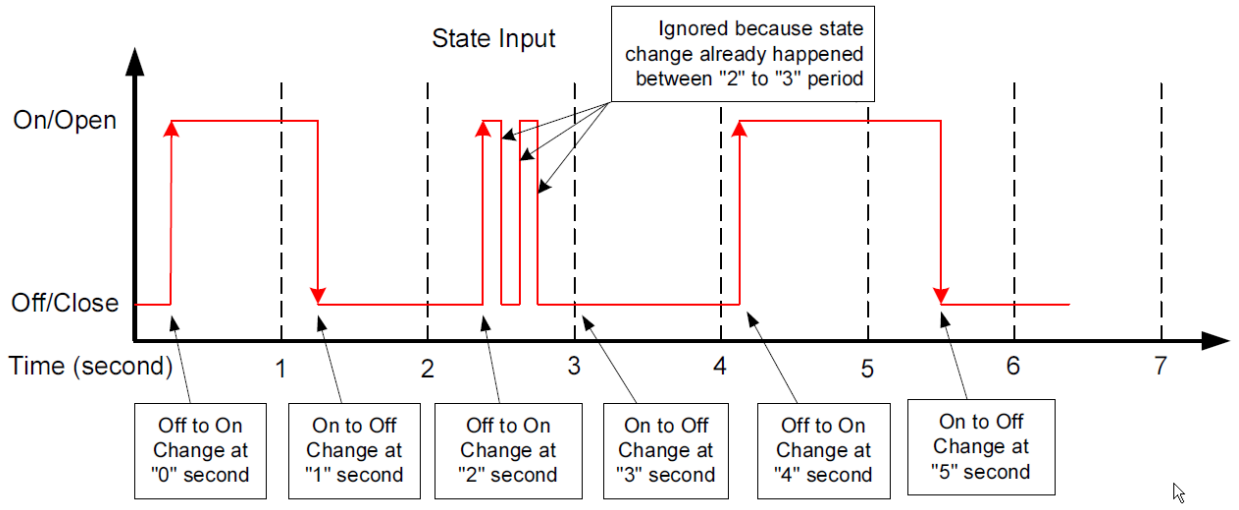
Channels	CH1 – Excitation sense input CH2 - ±8 mV input range
Excitation Voltage Output	2.5VDC (Max load current: 10mA)
Accuracy	± 0.2% @ 25°C

VL-P – State/Event/Pulse Inputs, Range Programmable

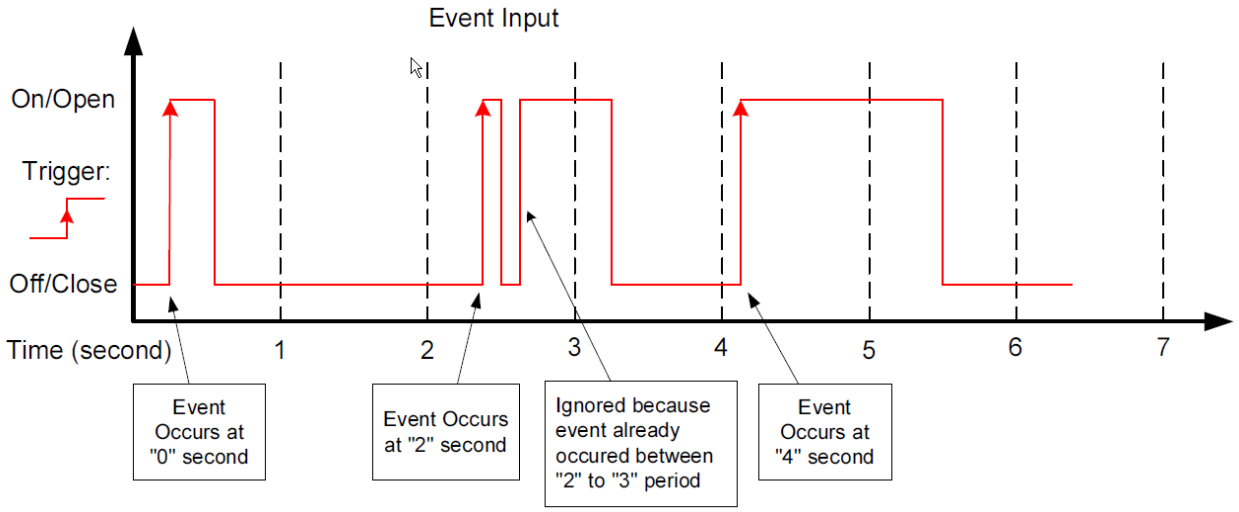
VersaLog P is a 7-channel, battery powered, stand-alone pulse/state/event data logger. The logger detects electronic or mechanical pulse counts, state changes or events in any of the seven channels. Data is stored in non- volatile flash memory for later retrieval. It works with gas/water/power meter, rain gauge, flow rate meter and any other digital signal/switch closure output devices.



State channel is used to detect a state changes. It records the time stamp when a state changed from Off/Close to On/Open and from On/Open to Off/Close . The resolution of the time stamp is the sampling interval. i.e. if a state changed more than once during a sampling interval period only the first state will be recorded (the third period in the diagram below). A typical application is to monitor how long a device is on and off.



Event channel is used to detect the number of events that occur but not the duration of the event. In each sampling interval period if it detects an event, it saves the event with the time stamp. The resolution of the time stamp is the sampling interval. i.e. if there are more than one events occur during the same sampling interval period it only saves the first event (the third period in the diagram below). A typical application is to monitor rainfall with tipping bucket.

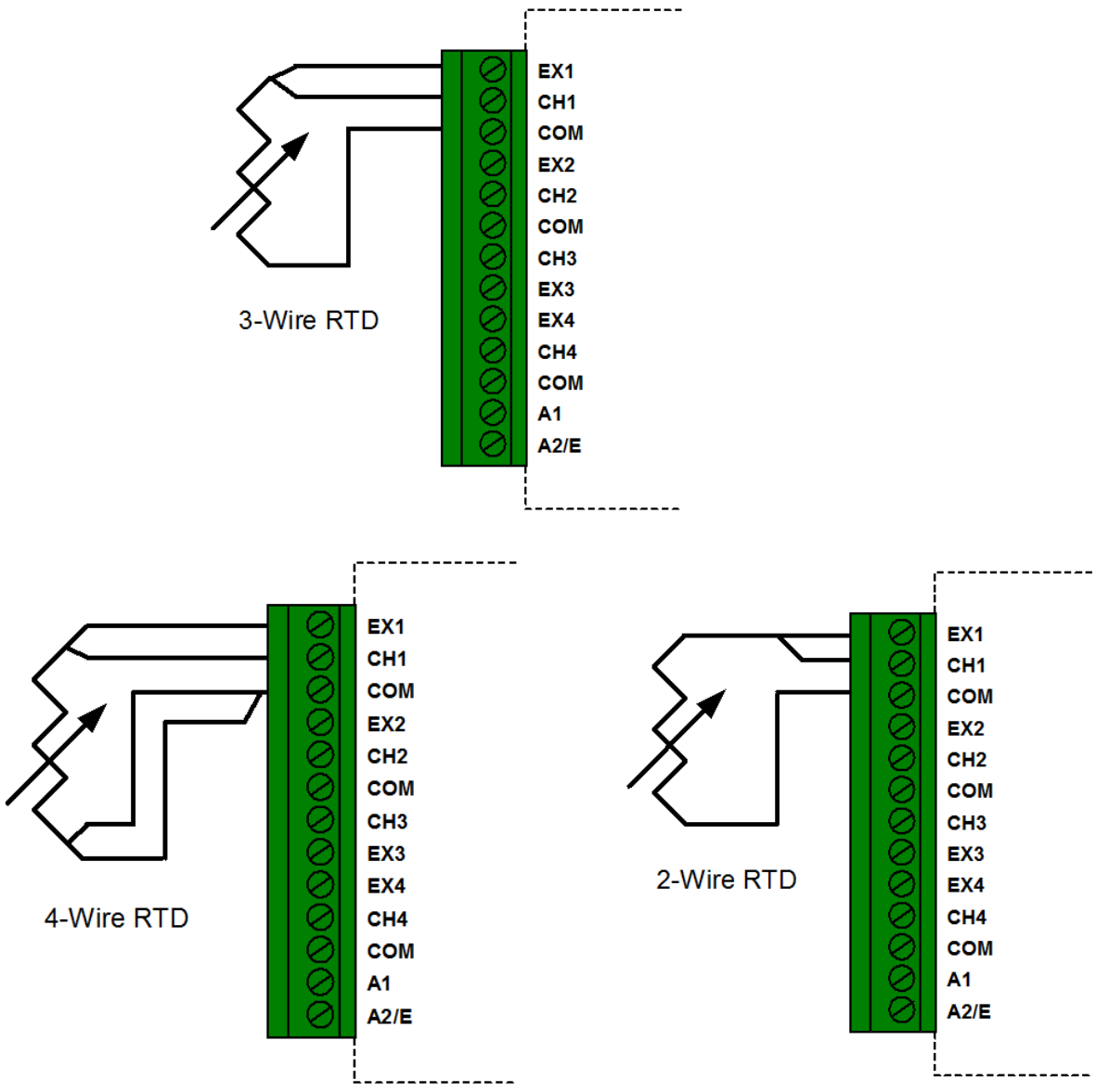


Connections	Pluggable terminal block for seven external channels and alarm outputs.
Channels	Seven external channels record state changes, event or pulse count. Each channel can be configured as either stage, event or pulse channel based on applications. For Event and Pulse configuration, each channel's trigger detection can be configured between Normal Open (High to Low)

	(suggested) and Normal Close (Low to High) (not suggested)
Type of Inputs	Voltage, solid state switch, coil relay, dry contact, digital TTL signal.

VL-RTD-1 (for PT100)

Besides the on-board thermistor channel, VL-RTD-1 logger has four external channels used to measure the external RTD sensors. The following figure illustrates the correct input connections:



Channel and Sensor Specifications:

Connections:	Plugeable terminal block for four external channels, excitation controls and alarm outputs
Channels:	CH0: on-board thermistor (-40 ~ +70°C (-40 to + 158°F). CH1 ~ CH4: three-wire/two-wire RTD. VL-RTD-1: 20 ~ 400 Ohms (-200°C ~ 850°C) Built-in equations for TCR 0.00385 and 0.00392
Resolution:	0.0018% (PT100: 0.02°C)
Accuracy:	Thermistor channel: +/- 0.2°C(0°C ~ 70°C) RTD channels: +/- 0.015% @ 25°C LRTD-1: +/-0.16°C @ 25°C

Choose Right Equation for RTD Sensors:
SiteView provides two factory RTD equations for measuring the temperature values:

RTD_TCR385:
This equation is for RTD sensor (PT100) with TCR 0.00385 Ω/Ω/°C between 0 and 100°C. The temperature coefficients are:
A: 3.9083E-3 B: -5.775E-7 C: -4.183E-12

RTD_TCR392:
This equation is for RTD sensor (PT100) with TCR 0.00392 Ω/Ω/°C between 0 and 100°C. The temperature coefficients are:
A: 3.9848E-3 B: -5.87E-7 C: -4E-12

SiteView also provides a custom equation called **RTDEquation** in case a RTD sensor has different characteristics. The sample code looks like below and you can change TMAX, TMIN, A, B, C and R0 to make it suit for your application:

```
//    A custom equation for any RTD sensor
//    Please change the following parameters based on the RTD types

const double TMAX = 850; //maximum temperature range in degree C
const double TMIN = -200; //minimum temperature range in degree C
//temperature coefficients. Change them accordingly
const double A = 3.9083E-3;
const double B = -5.775E-7;
const double C = -4.183E-12;
//resistance value in OHM at zero degree C
const double R0 = 100;

//A custom equation. Do not change equation name. Equation must return a value.
public double RTDEquation(double Input)
{
    //Input is resistance in Ohm
    double r = Input;

    double t;
```

```
        double rtst;
        double tindex;
        int loop = 0;
        tindex = (TMAX - TMIN) / 4;
        t = (TMAX + TMIN) / 2;
        rtst = T2R(t);
        while (0.999999999 * r > rtst || rtst > 1.000000001 * r)
        {
            if (rtst < r) t += tindex;
            if (rtst > r) t -= tindex;
            tindex /= 2;
            rtst = T2R(t);//call helping function for resistance in OHM
            //make sure no infinite loop if the value is out of the range
            if (loop++ > 40)
                break;

        }
        return t; //always return value in degree C
    }

    //helping function
    double T2R(double t)
    {
        double r;
        // if t < 0
        if (t < 0)
            r = R0 * (1 + A * t + B * Math.Pow(t, 2) + C * (t - 100) * Math.Pow(t, 3));
        // if t >= 0
        else
            r = R0 * (1 + A * t + B * Math.Pow(t, 2));
        return r;
    }
```

4 Basic Functions

Built-In Equations

Equation and Channel Type are two essential parameters to make sure the physical measurement can be converted correctly.

An equation is a software functionality identified by its name of up to 16 characters. A built-in equation is an equation provided by VersaLog SiteView software to convert a measurement for a specific channel type.

A channel must have an equation assigned to it in order to make the measurement conversion.

“Digit” built-in equation can be assigned to any channel type. If you assign “Digit” equation to a channel the physical measurement will be the original digital value measured by ADC (Analog-to-digital converter) hardware.

The following table lists all available built-in equations for all channel types:

Channel Type	Equation Name	Equation Description
Internal-Thermistor	Temperature	Temperature
External-Thermistor	Temperature	Temperature
0-20 VDC	VoltageDC	Voltage DC
-5 to +5 VDC	VoltageDC	Voltage DC
0-20 mA DC	CurrentDC	Current DC
Thermocouple Rage1: -8 to +73 mV	ThermocoupleE ThermocoupleJ ThermocoupleK ThermocoupleN ThermocoupleT VoltageDC	Thermocouple E Thermocouple J Thermocouple K Thermocouple N Thermocouple T Voltage DC
Thermocouple Rage3: -2 to +18 mV	ThermocoupleB ThermocoupleE ThermocoupleJ ThermocoupleK ThermocoupleN ThermocoupleR ThermocoupleS ThermocoupleT VoltageDC	Thermocouple B Thermocouple E Thermocouple J Thermocouple K Thermocouple N Thermocouple R Thermocouple S Thermocouple T Voltage DC
Pulse	Pulse	Pulse
Event	Event	Event
State	State	State
RTD	RTD_TCR385 RTD_TCR392	For TCR of 0.00385 For TCR of 0.00392

Measuring & Logging

During the session of logging, when it's time to sample, the Accsense VersaLog data logger measures the signal of each enabled channel, converts it to digital value and saves to the on-board memory.

Accsense VersaLog data loggers use a group of preset parameters to decide when and how to take in data and save it to the memory. Those parameters can be configured by VersaLog SiteView software and their definitions are given as below:

Start Time:
This parameter specifies the date and time when the logger starts the session of logging.

End Time:
This parameter specifies the date and time when the logger will stop the session of logging. This value may be overridden by **Logging Mode** parameter. . If **Logging Mode** was set to **Continue Logging**, the **Start Time** and the **End Time** will be shifted forward.

Sampling Interval:
This parameter specifies the time span the logger will wait after it takes the first sample and before it takes the second sample.

If the logger is configured with a sampling interval of 4 seconds or faster, it will operate in fast sampling mode. When a logger is in fast sampling mode, it has the following conditions:

1. The logger needs external power supply (supplied by USB or AUX port) for the logging period.
2. Any communications with the logger will interrupt its operation and stop the recording.
3. The number of enabled channels depends on the sampling intervals:
   1 channel with 20 ms interval
   2 channels with 30 ms interval
   8 channels with 40 ms or bigger interval

Logging Mode:
This parameter specifies if the logger will stop or continue logging when the memory is full. Available settings are **Stop Logging** and **Continue Logging**.

If **Logging Mode** was set to **Stop Logging**, the logger will stop logging at the **End Time**. If **Logging Mode** was set to **Continue Logging**, the logger will continue logging and the oldest data will be overwritten by the new data.

Downloading Data

The data in the logger can be transferred to the computer by VersaLog SiteView software. If the logger is not in **Fast Sampling** mode, the data can be downloaded any time even when the logger is still recording. If the logger is in **Fast Sampling** mode, downloading the data will make the logger stop logging at the time when it received the downloading command.

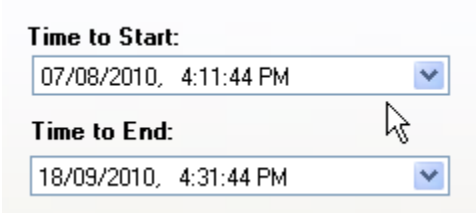
The readings saved in the logger are ADC digital values, and will be converted to physical measurements by VersaLog SiteView software after they are downloaded to the computer. The data conversion is handled by an equation that may be embedded in VersaLog SiteView software or a script provided by the user.

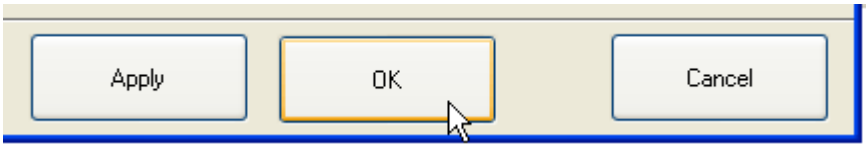
Field Activation

The Accsense VersaLog data logger comes with an on-board activation button which can be used to activate/initiate the logging session in the field.

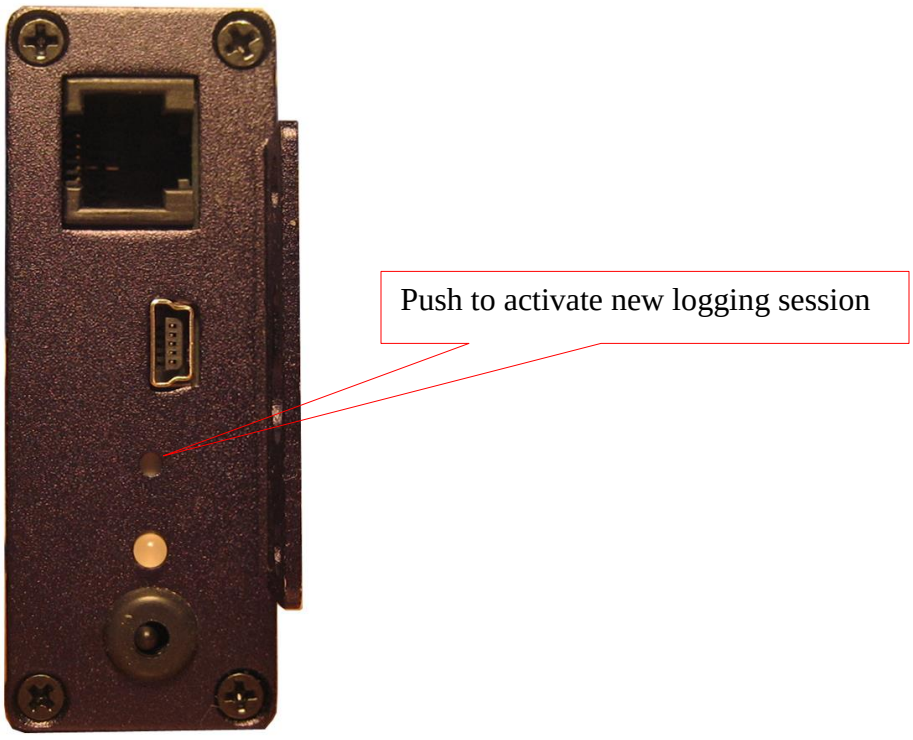
To activate the logger for new session:

1. With the VersaLog SiteView software, open the configuration dialog of the logger, and set the start time to any time the desired start time will never reaches. Click **OK** button to save new settings to the logger.





2. The logger is now in **Start Delay** mode. When you need to activate the logger, press and hold the Activation button on the logger. When you see the status LED starts to flash release the button. The logger is now activated and is recording data.



Field Activation

Note: The activation button cannot be further activated once the logger has started the new session.

Status LED

The Accsense VersaLog logger has an on-board LED used to indicate:

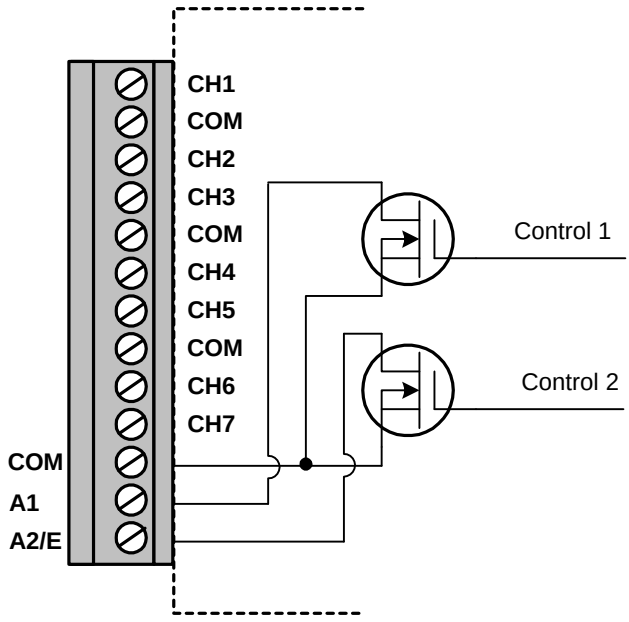
1. Sampling:
   When the LED was enabled by Accsense VersaLog, it will flash once in green when the logger is sampling. The colour of the LED can be overridden by the following conditions:
2. Alarms:
   The LED will flash red when it samples if any channel alarms are enabled and are triggered.
3. Low Battery:
   The LED will flash in amber when it samples if the logger detects a low battery level.

If you do not need the LED to indicate the status of operation you can disable it (via Accsense VersaLog) in order to increase the battery life.

Alarm1 & A2/EXT Terminals

Alarm1 and A2/EXT terminals internally connect to the on-board N-channel MOSFET switches. They can be used to control an external power supply to turn on/off devices like lamp, strobe light or siren, or coil relays. The maximum power the switches can supply is 200mA @ 24VDC.

The internal schematics of the switches are as follows:



Alarm1 and A2/EXT can be associated with alarm state and/or excitation control. Please refer to Alarm Output and Excitation Control for details.

Alarm Output

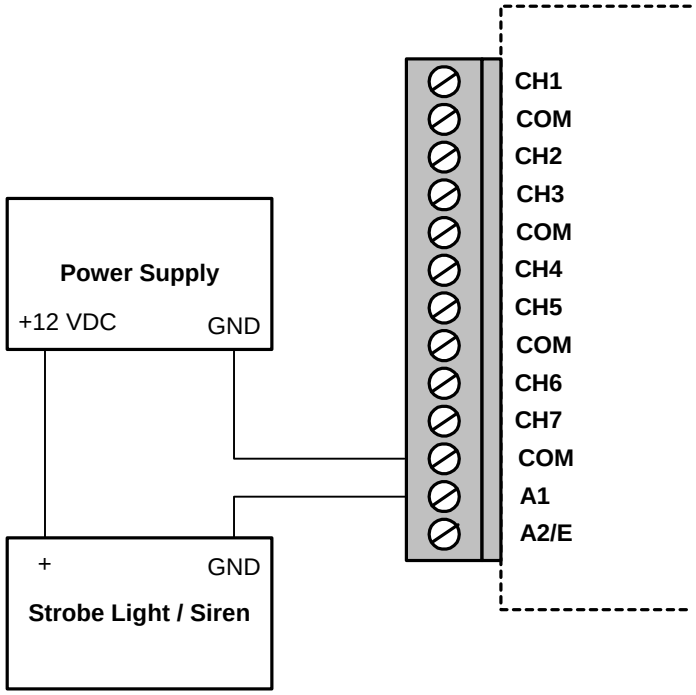
The logger will be in a state of alarm if **ALL** of the following conditions are met:
1. Channel alarms are enabled.
2. The logger is logging the data.
3. Current sampled reading is beyond low or high alarm thresholds.
4. Alarm-On Delay counter has moved down to zero.

When the logger is in alarm state, Alarm1 and/or A2/E terminal strips can be configured by Accsense VersaLog to be activated certain time after an alarm was triggered. The delay time selections are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 minutes.

The following alarm output combinations can be set by Accsense VersaLog:

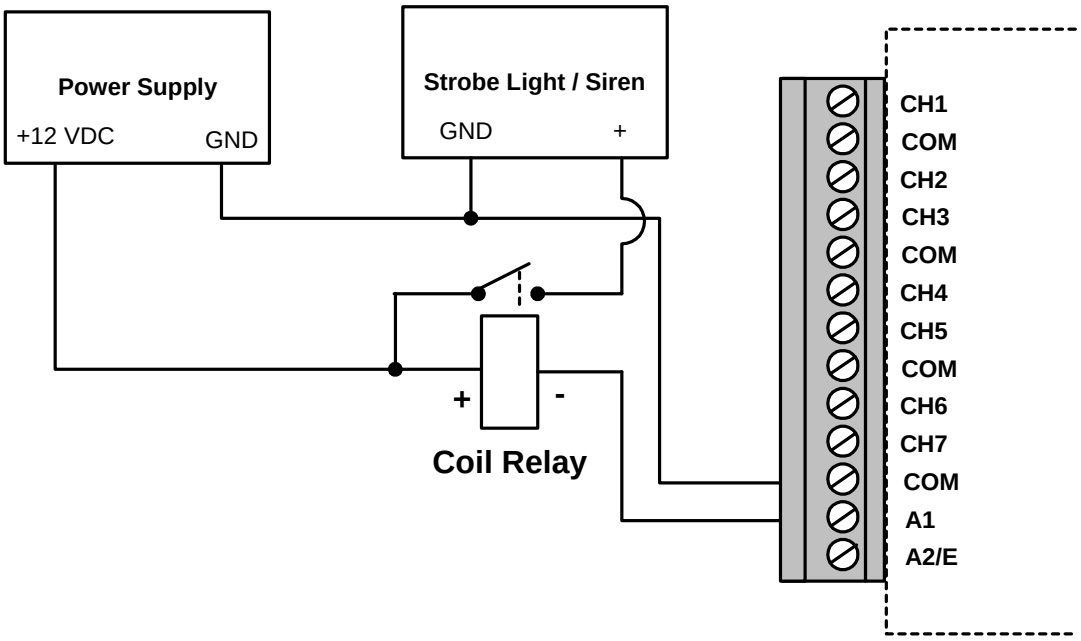
Alarm1 & A2/E Options	**Description**
Disable any output -> Alarm1 and A2/EXT	No output connects to Alarm1 and A2/E terminals.
High alarm -> A2/EXT only	High-alarm state controls A2/EXT terminal.
Low alarm -> Alarm1 only	Low-alarm state controls Alarm1 terminal.
High alarm -> A2/EXT and low alarm -> Alarm1	High-alarm state controls A2/EXT terminal and low-alarm state controls A1 terminal.
High alarm and low alarm -> Alarm1	Both high and low alarm states control A1 terminal.
Excitation control -> A2/EXT	Excitation controls A2/EXT terminal.
Excitation control -> A2/EXT and both alarms -> Alarm1	Excitation controls A2/EXT and both high and low alarm states control Alarm1 terminal.
Excitation control -> A2/EXT and low alarm -> Alarm1	Excitation controls A2/EXT terminal and low alarm state controls Alarm1 terminal.
Excitation control -> A2/EXT and high alarm -> Alarm1	Excitation controls A2/EXT terminal and high alarm state controls Alarm1 terminal.

The following schematics illustrate the physical connections required to control and drive an external device by the alarm output:



Alarm1 is used as switch to turn on/off siren based on alarm state.

If the alarm device needs more power to drive, A1 provides control signal to drive a coil relay as follows:



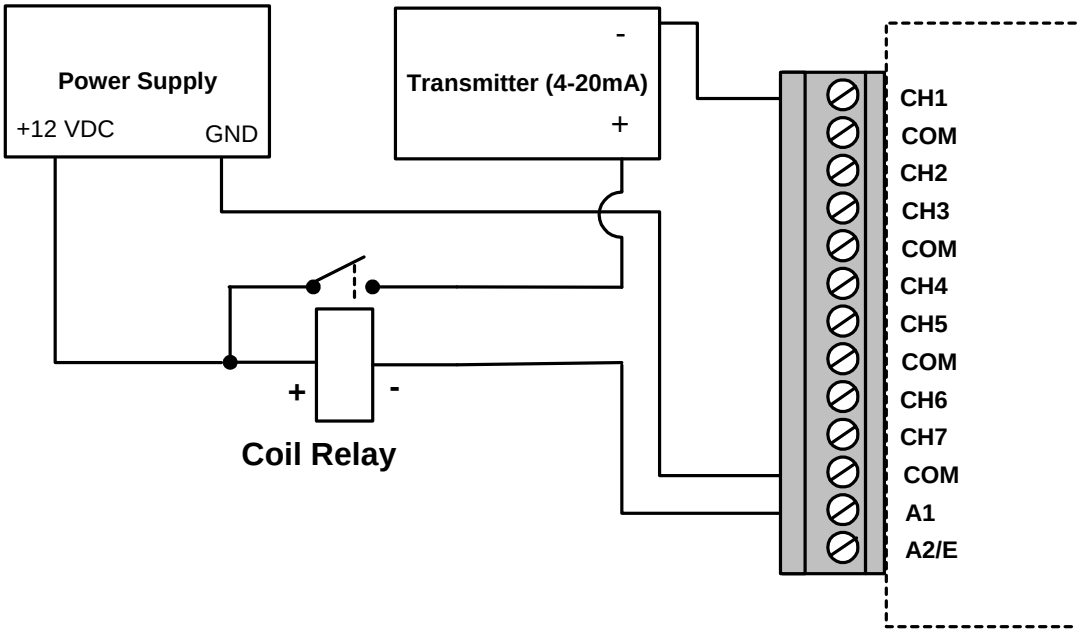
Alarm1 is used as switch of the power supply.

Excitation Output

Excitation output is used when you need to save the electric power of the device that provides the signal source to the data logger. When there is no local power available and a battery pack is used to power the transducer, excitation control greatly reduces power consumption. It turns on the transducer only when it samples the data and turns off the transducer after the sampling.

A2/EXT on the terminal strips can be configured by VersaLog SiteView software for excitation output purpose.

The following schematics illustrate the physical connections required to switch on/off an external battery pack for a 2-wire current loop transmitter:



5. Software

VersaLog SiteView Windows software is used to communicate with the Accsense VersaLog data logger for data downloading, logging management, and channel range configuration.

This section outlines basic functions that VersaLog SiteView offers. For complete instructions on how to use Accsense VersaLog software please refer to **Accsense VersaLog SiteView User's Manual** available for download online.

System Requirements

Computer:

CPU: 1.0 GHZ or above
Memory: 256M or above
Port: 1 USB port or 1 COM port
Hard Drive: 1GB or above

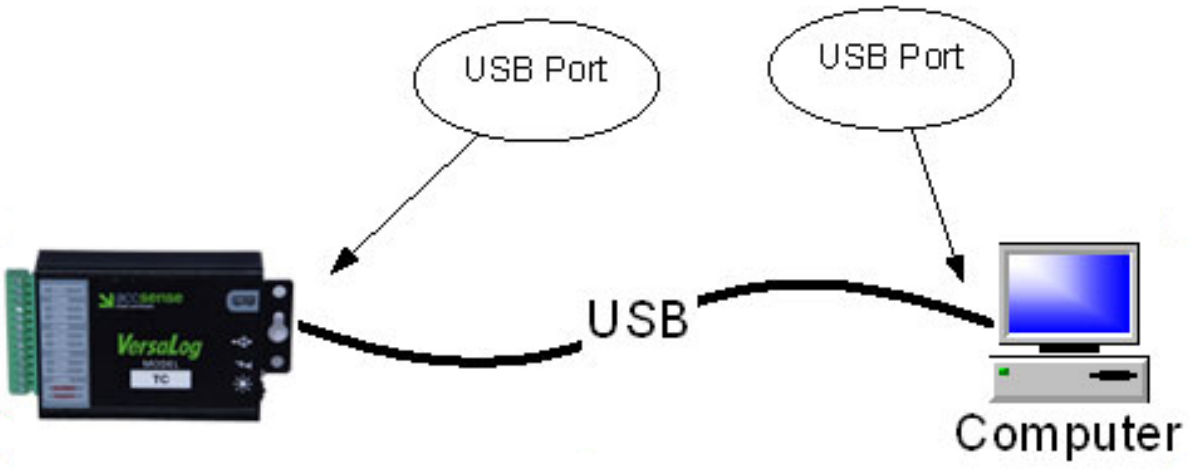
Operating System:

Windows XP with SP2 or above, Windows Vista, Windows 7, Windows 8

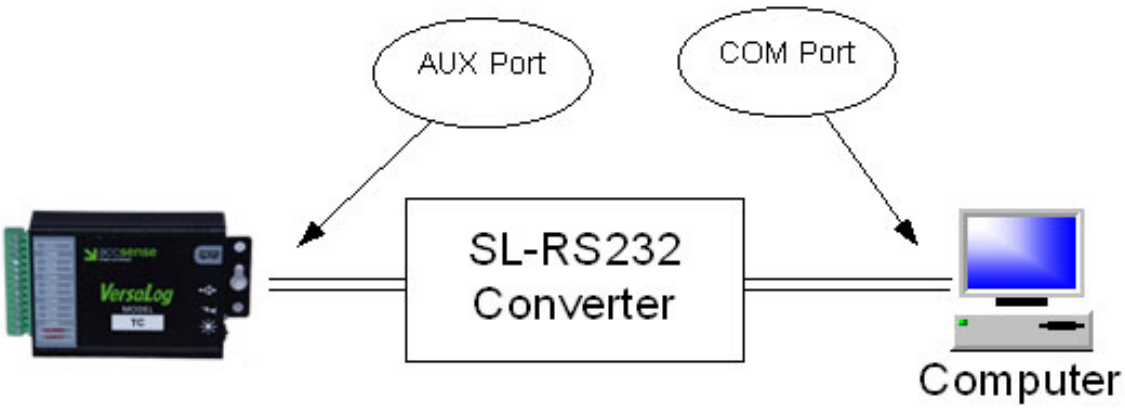
Communications Interfaces

The Accsense VersaLog logger has both TTL-compatible serial port and USB interface. It can communicate with host device via either USB or serial port.

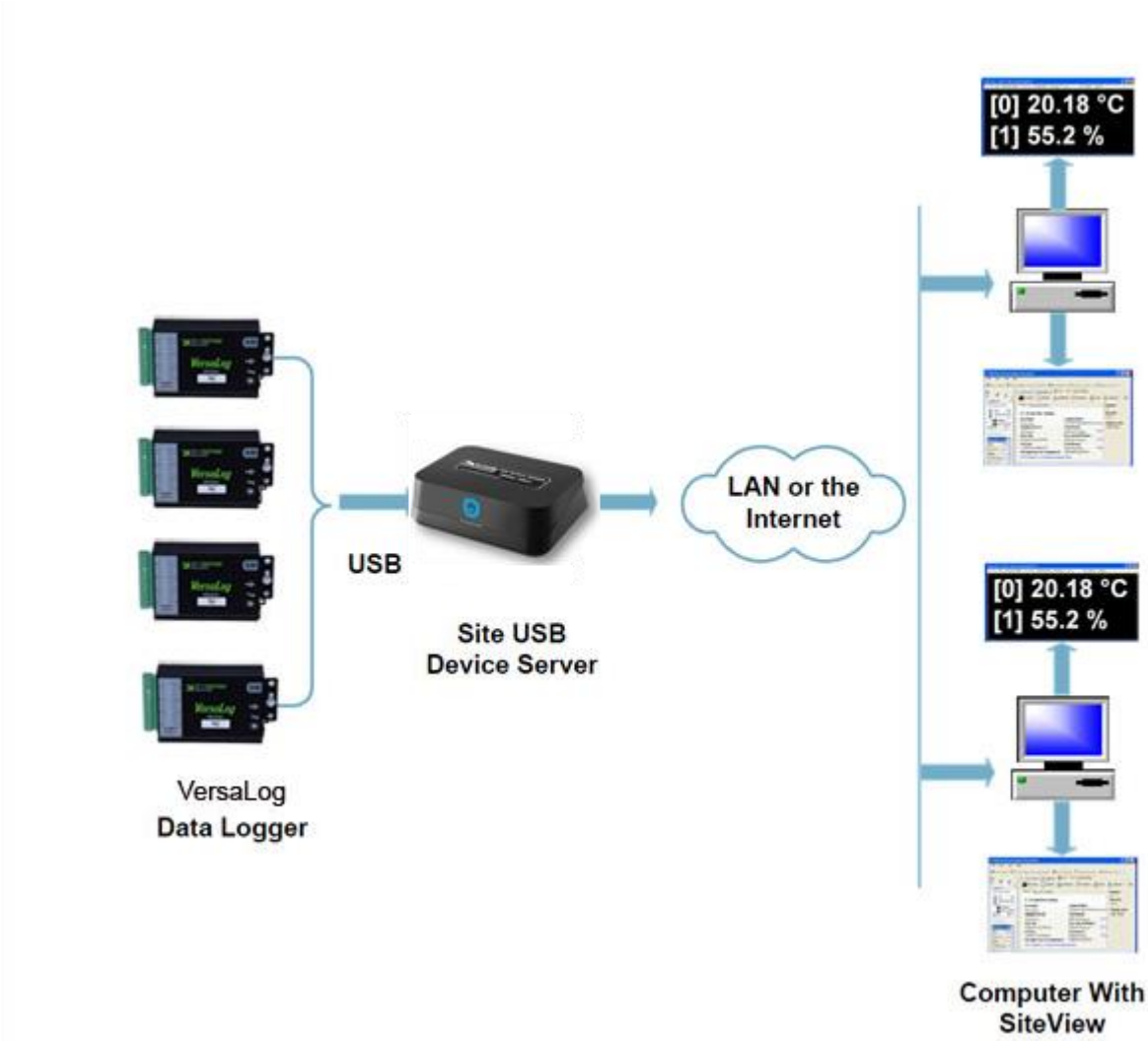
The following schematics illustrate different options that VersaLog SiteView software can communicate with a data logger.



USB Connection



Serial Port Connection

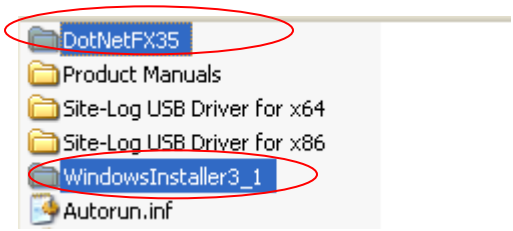


Ethernet Connection (with Site USB Device Server)

Install Accsense VersaLog

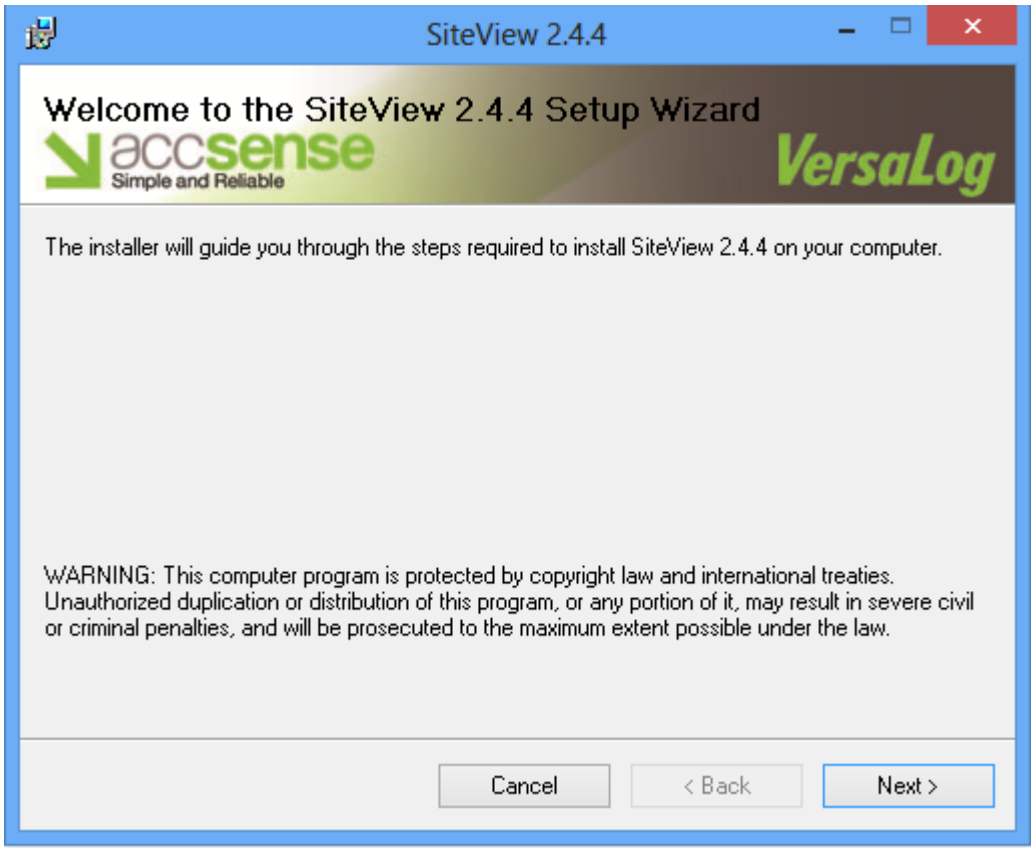
1. Install Prerequisites (For Windows XP Users):

   If your computer does not have WindowsInstaller3.1 and .Net Framework 3.5 or above installed please manually install them from the enclosed CD.

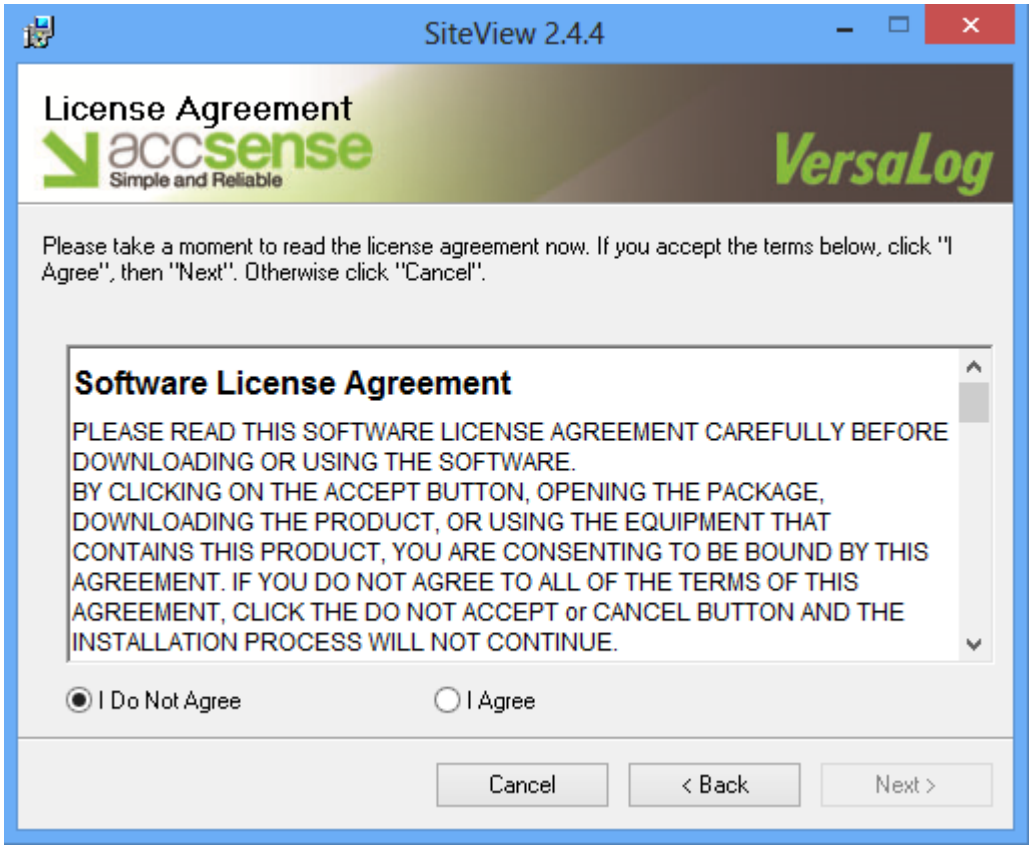


2. Install VersaLog SiteView.

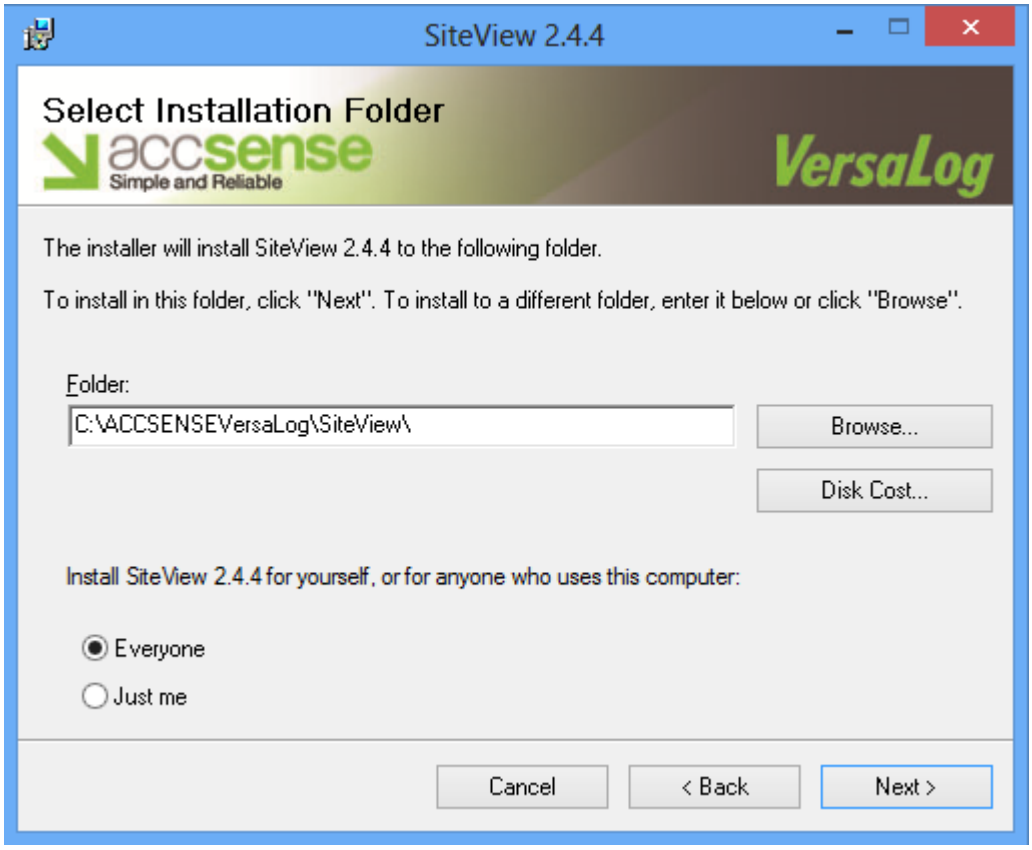
   Insert the included CD to the CD Drive. The installation should start to run automatically. Follow the on-screen instructions to complete the installation.



Click “Next >” button to proceed to the next page.

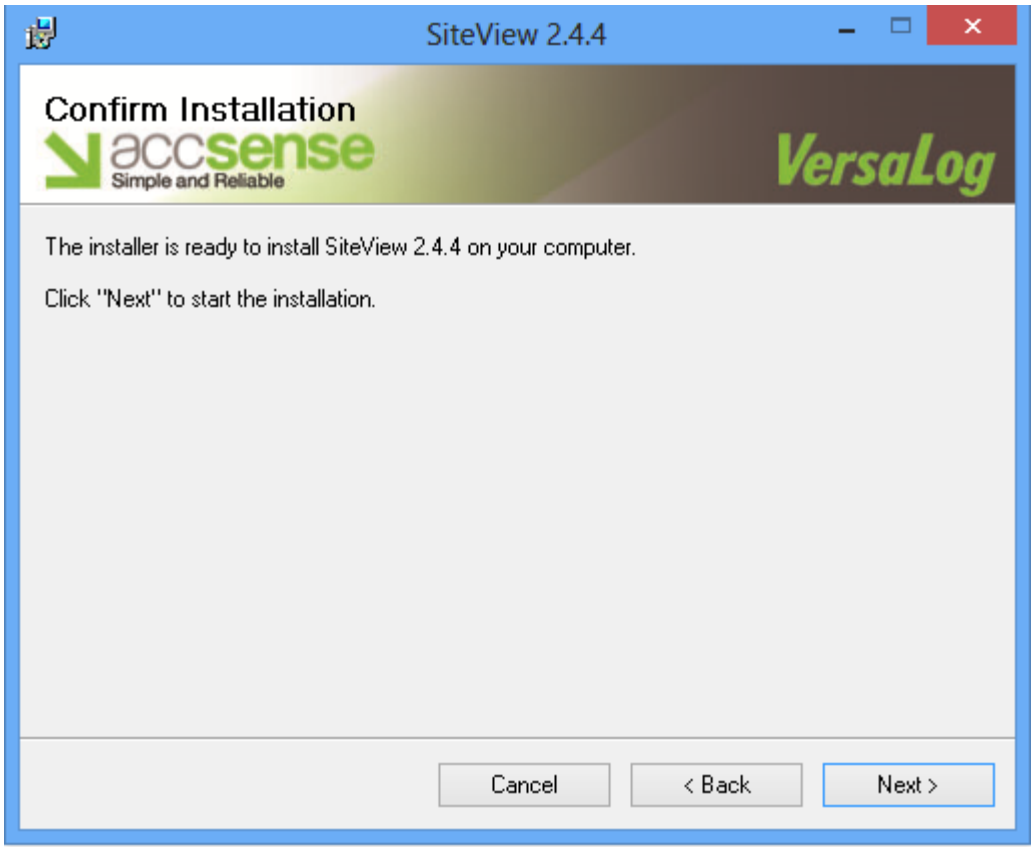


Please read the License Agreement carefully. If you accept the terms click “I Agree”, then click “Next >” button. Otherwise click “Cancel” to cancel the installation.

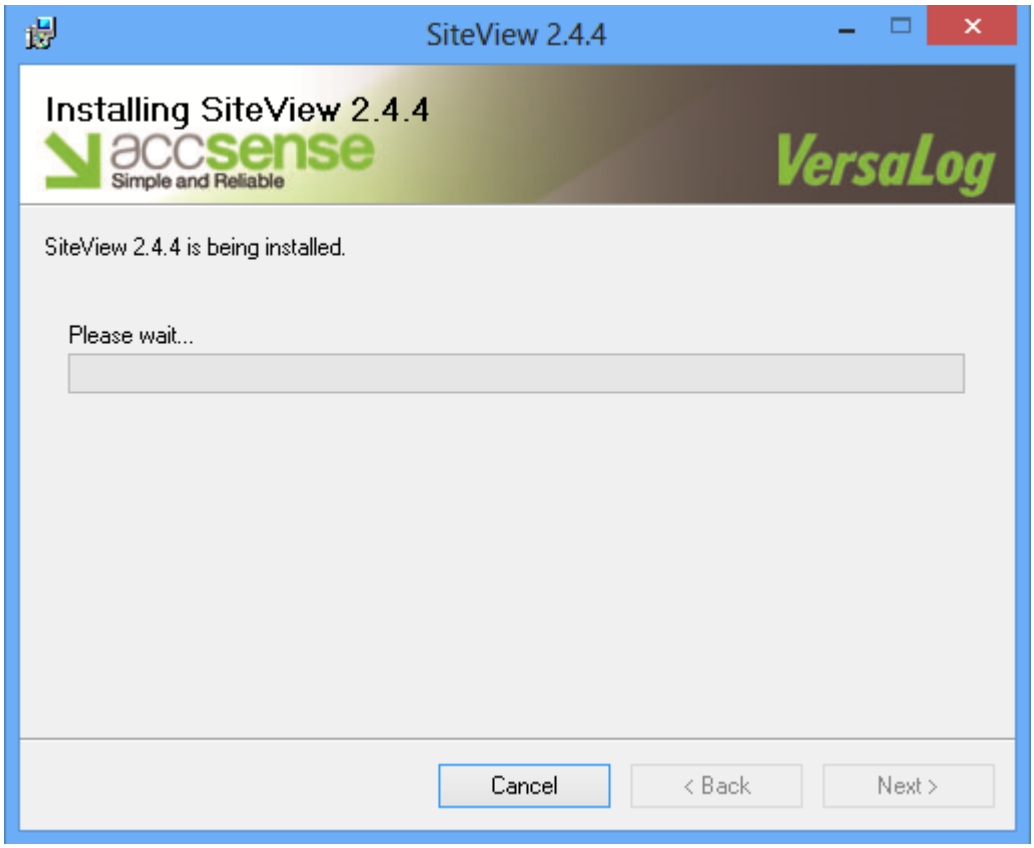


In this dialog select a destination folder where VersaLog SiteView will be installed. We recommend you keep the default folder.

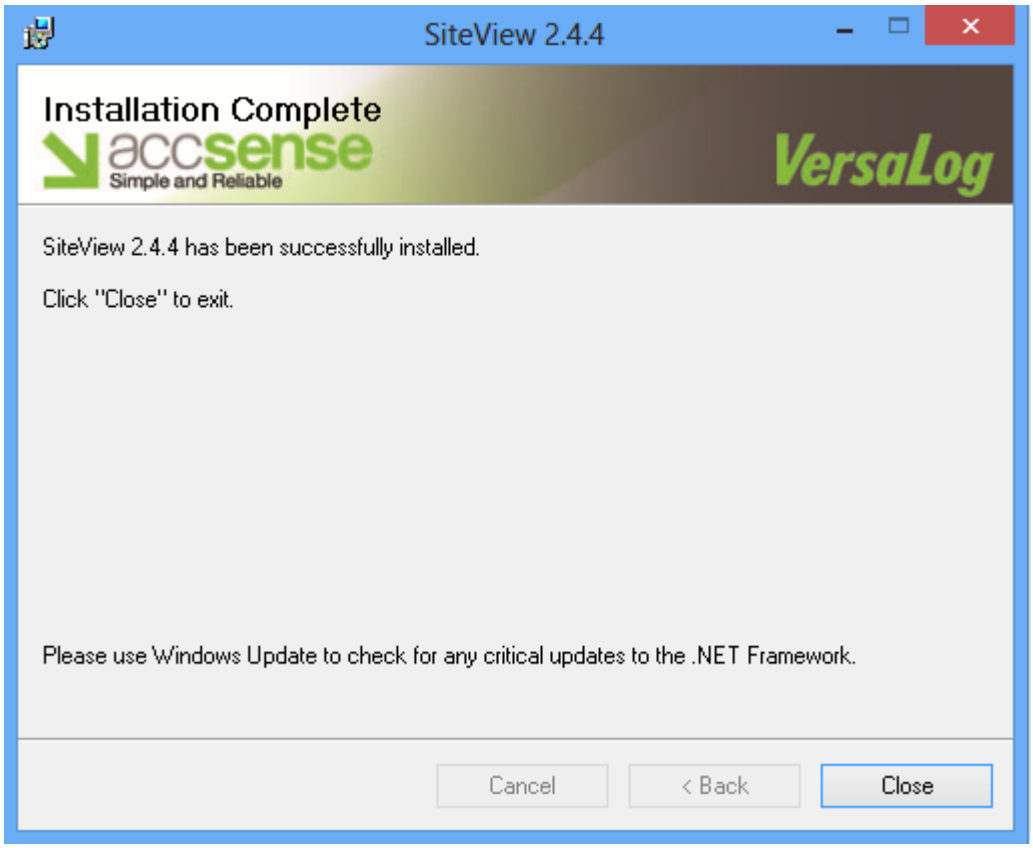
Once you are ready, click “Next >” button to proceed to the next page.



This confirmation page gives you the chance to modify previously selected options. Click “Next >” button to start the installation.



As VersaLog SiteView is being installed the above dialog shows the installation progress by percentage. Once the installation is complete, the below dialog appears:



Click “Close” button to finish the installation and close the dialog.

Install USB Driver

Upon the completion of the above steps, the Site-View USB Driver Installation dialog will start automatically.

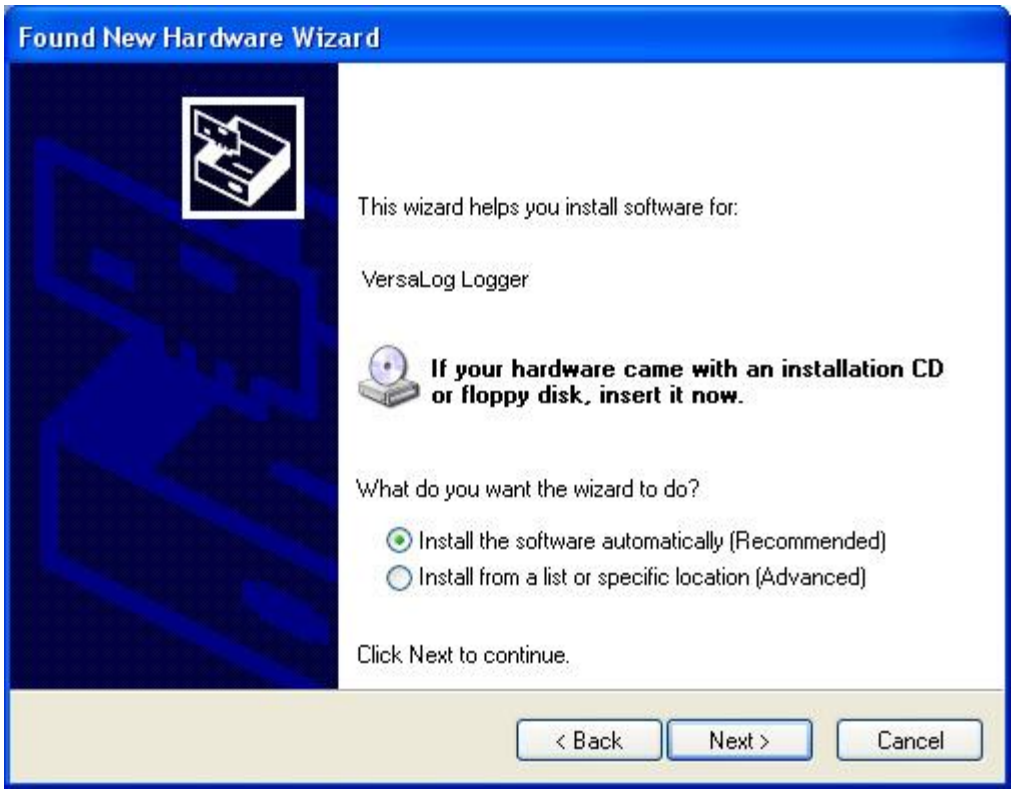
Connect Data Logger

Connect the logger to the computer's USB port. Windows Vista and Windows 7 will automatically recognize the data logger.

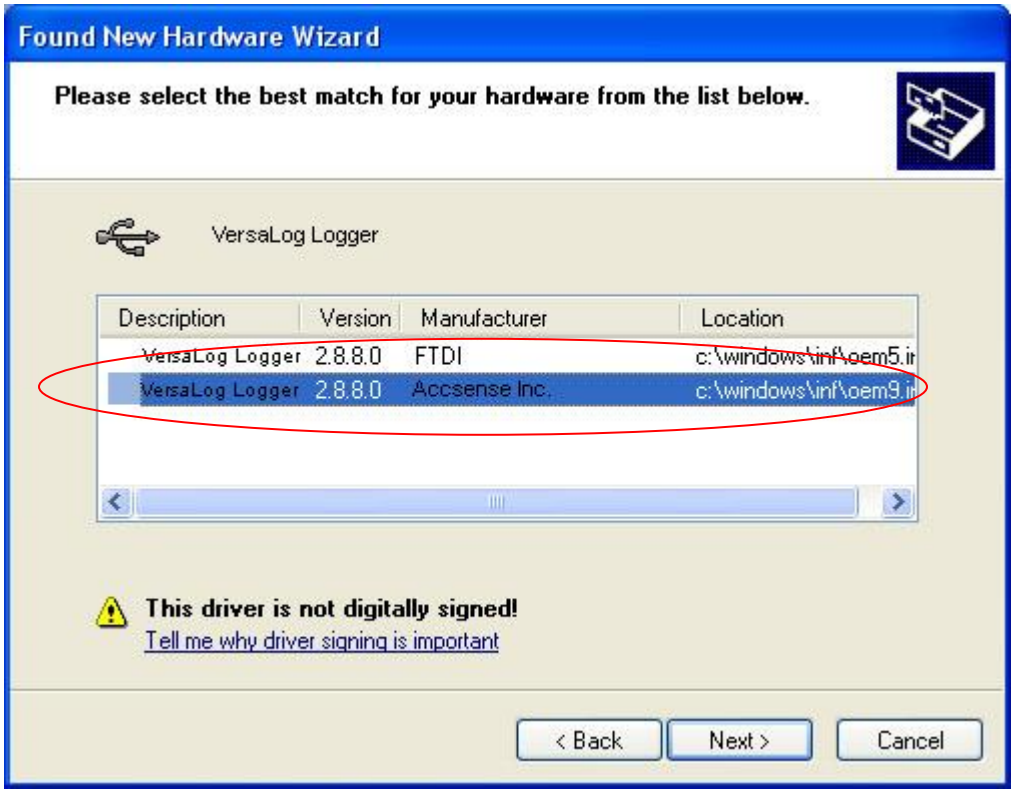
For Windows XP users, the following dialog window will appear:



Select "No, not this time" from options available and then Click "Next >" to proceed with the installation.



Select "Install the software automatically (Recommended)" as shown in the above figure and then click "Next >".

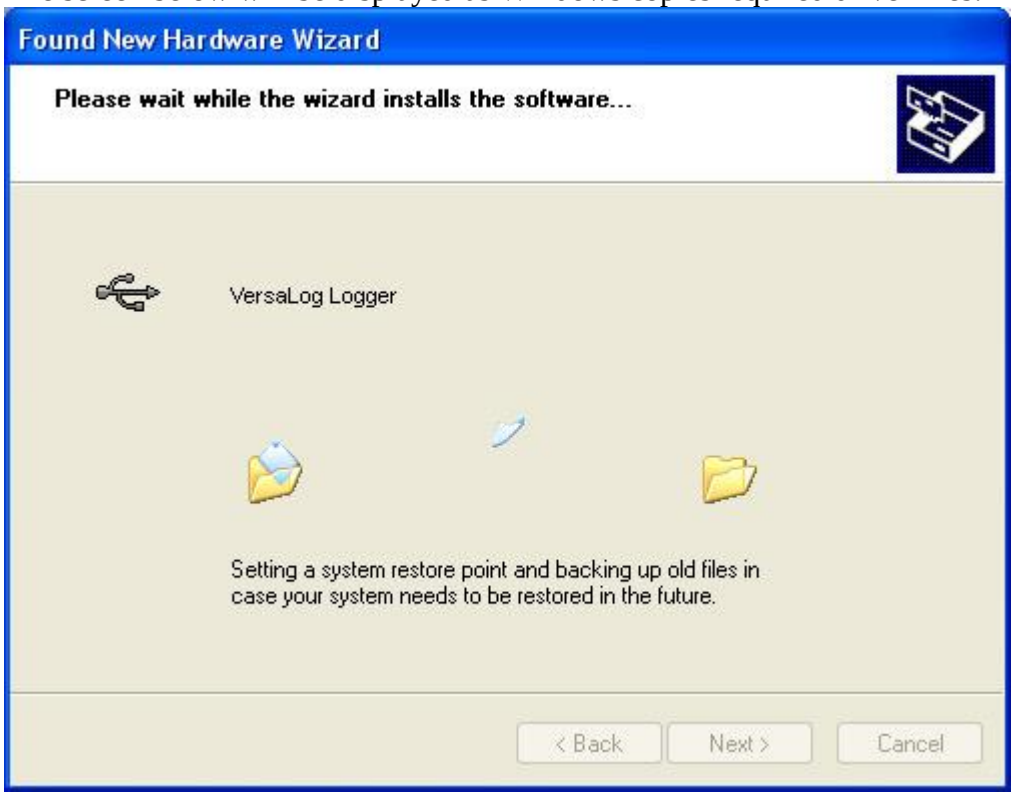


Select the item with Manufacturer of Accsense VersaLog and click “Next>” to proceed.

In the following message dialog, click "Continue Anyway" to continue with the installation:



The screen below will be displayed as Windows copies required driver files:



Windows should then display a message indicating the installation was successful:



Activate Accsense VersaLog

After the installation Accsense VersaLog needs to be activated by entering Product Key you obtained when you bought Accsense VersaLog.

If the above installation of VersaLog SiteView was successful, VersaLog SiteView can be launched by either one of the following methods:

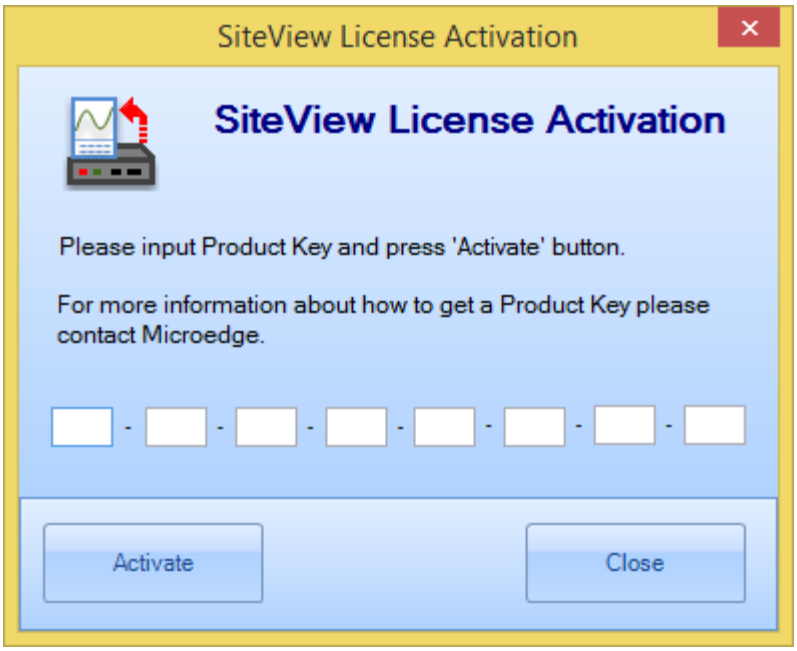
Double click on SiteView icon on the desktop:



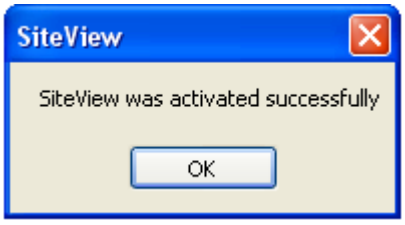
Or:

Using Windows Start Menu, select Start : All Programs: Accsense VersaLog: SiteView.

Double click “SiteView” icon on the desktop, and the following dialog appears:

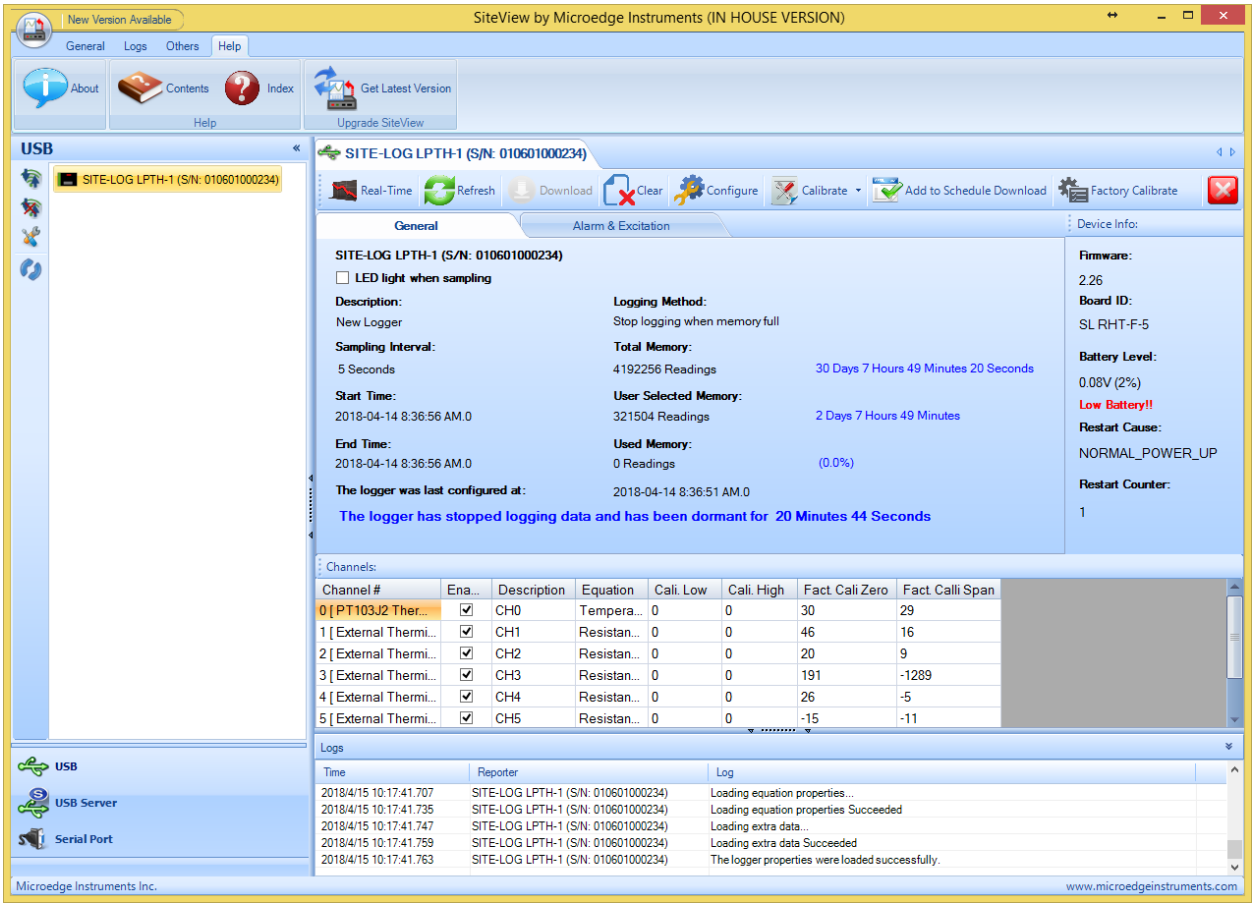


Enter the Product Key, then click the **Activate** button. If the Product Key is accepted the following confirmation dialog will appear:



Click **OK** button to finish the activation. From now you can start using VersaLog SiteView.

Main Window Frame



Communication Panel

The communication Panel contains USB, USB Device Server, Serial Port and Serial Device Server communication tabs that are used to deal with the respective physical logger connections to the computer. For instance, if the logger is connected to the computer via a USB port you need to use USB tab to communicate with the logger.

Menu Bar

The Menu Bar contains File, View, Tools, and Help menus and their respective sub menus that are used to complete various tasks.

Tool Bar

The Tool Bar provides an easy way to access the menu items by including some of the frequently used items on the tool bar as the tool bar buttons.

Main Working Panel

The Main Working Panel contains a series Tab pages for logger status and the graph information illustrated as the follows:

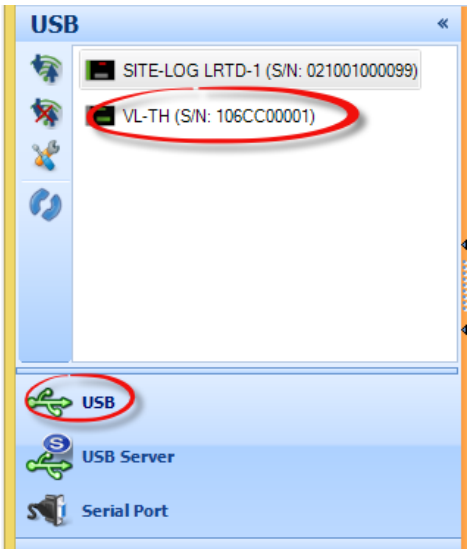


Information Log Panel
This section shows the information logs for any activities Accsense VersaLog does. This is for diagnostics and information purposes.

View Logger Status

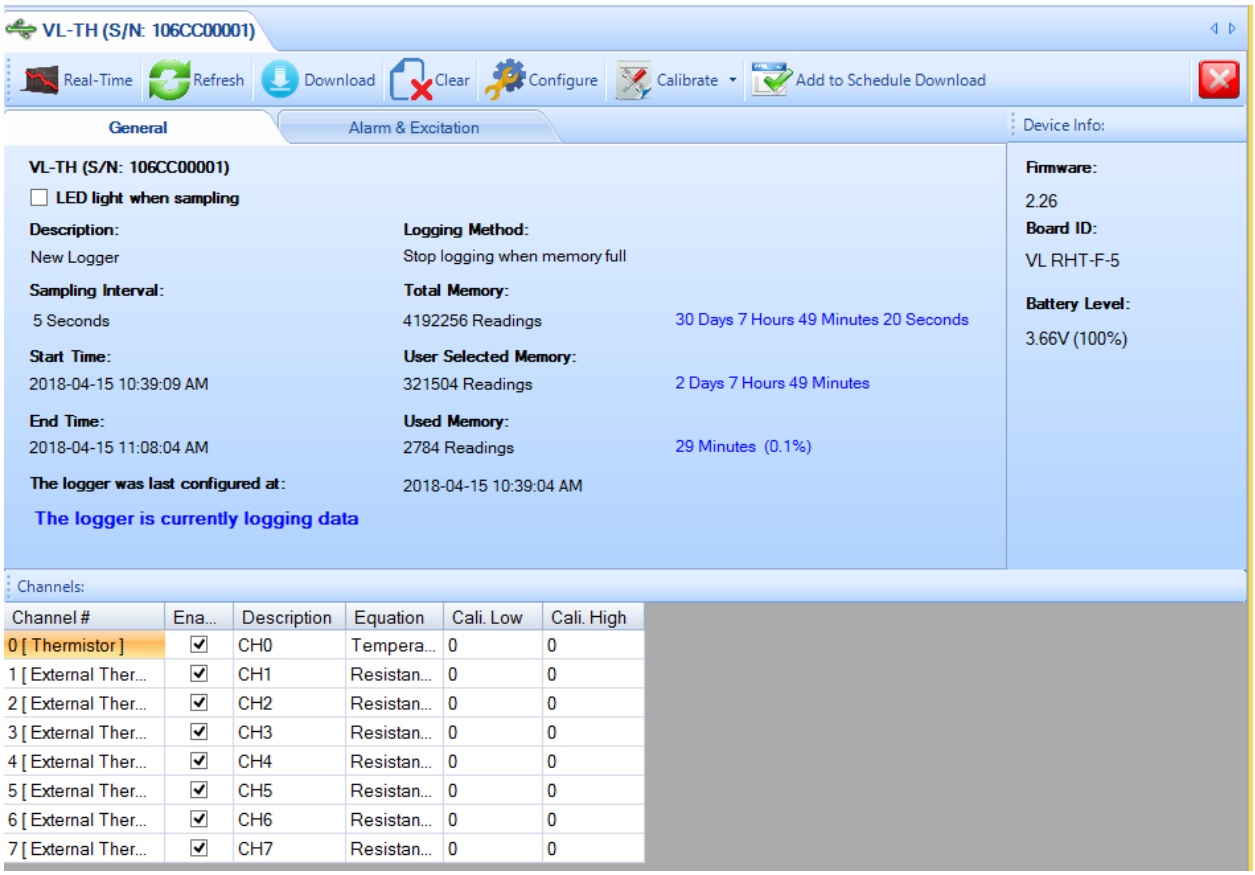
This manual will use USB as an example of communications interface. For other communications interfaces please refer to **Accsense VersaLog User's Manual** available for download online.

If the logger is connected to the computer correctly the logger icon should show in USB tab of the communication panel illustrated below:



Double clicking **Accsense VersaLog Logger** icon or clicking "Contact" button with the icon been highlighted will bring up the logger status page.

The status page shows the start and end time, sampling interval and other properties of the connected logger:

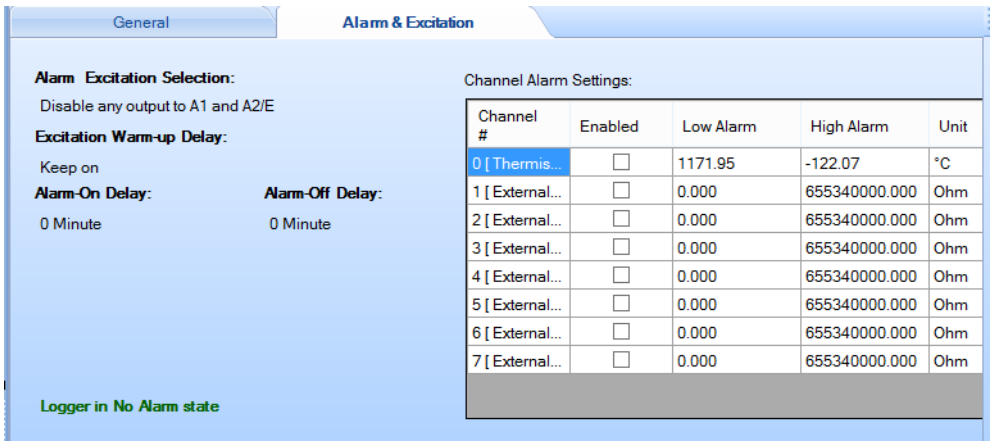


General

This sub tab page displays the general properties of the logger.

Alarm & Excitation

This sub tab page displays the properties regarding the alarm and excitation. By clicking the "Alarm & Excitation" tab page caption, the following page will appear:



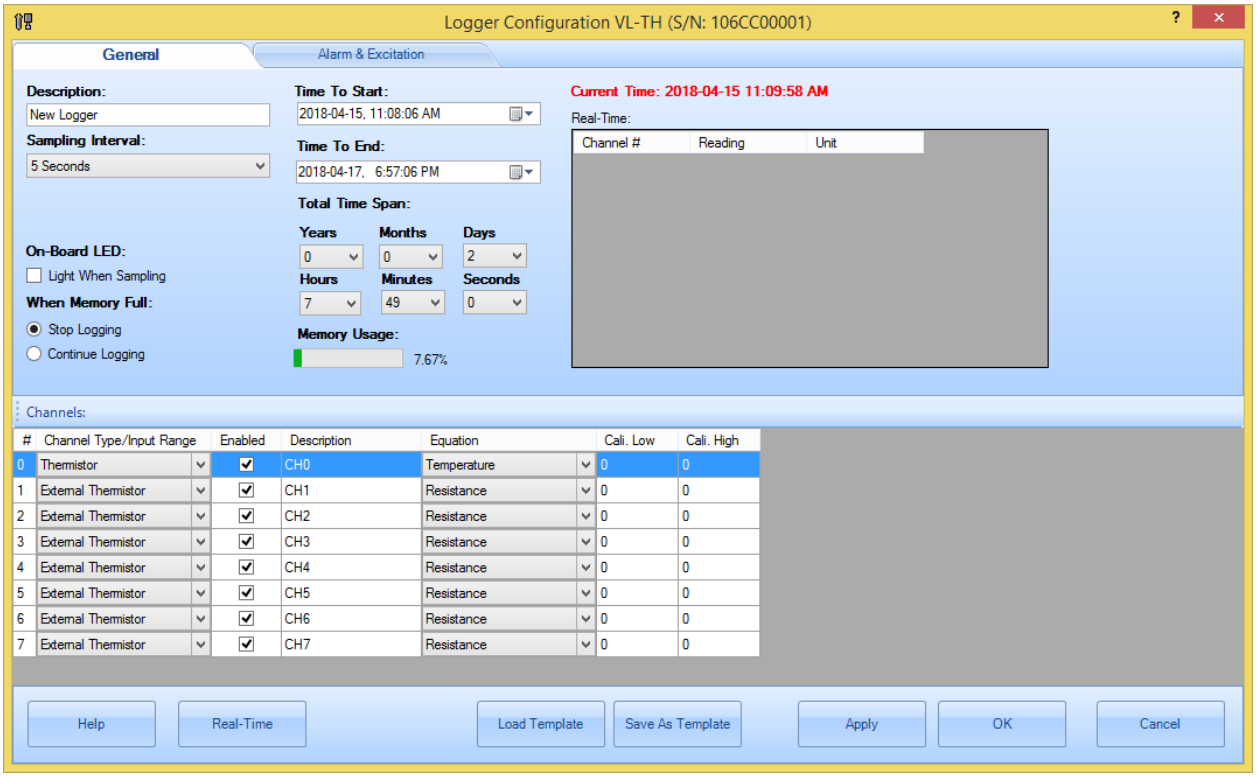
Through the tool bar buttons you can act on other tasks described in the following chapters.

Configure Logger

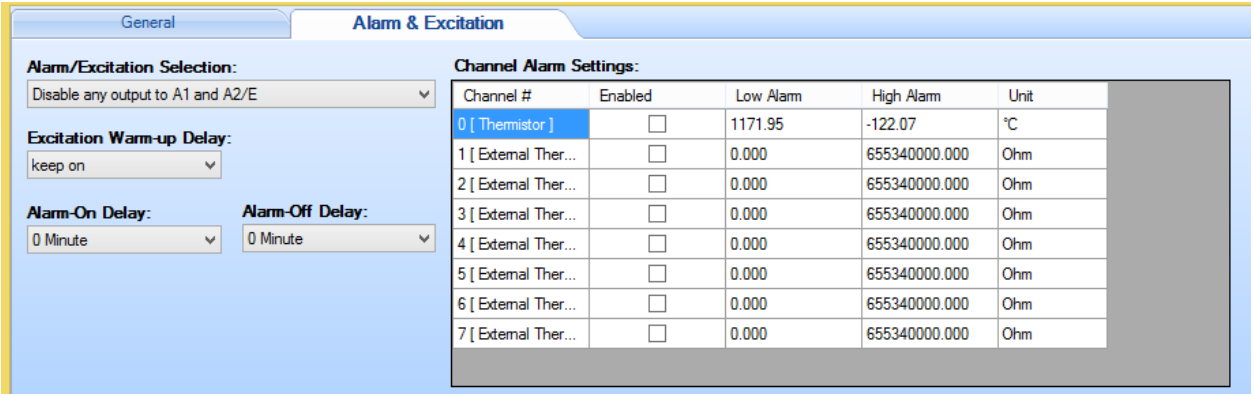
Configuration of the logger is a procedure to edit the properties of the logger and to start the new logging session.

If you are already in the logger status panel, clicking on the **Configure** button will bring up the configuration dialog window:





There are two tab pages in this dialog. The **General** page is displayed in the above screen shot. If you click **Alarm & Excitation** tab the following page will appear:



The following fields are for editing:

Description:
Description specifies the information about the logging session with a maximum of 30 characters. It will be the default Title section of the plot in the plot view.

Sampling Interval:
This field specifies the time span the logger will wait between two measurements sampling. Valid settings are:

Sampling Interval for Fast Sampling Mode	Sampling Interval for Normal Sampling Mode
20, 30,…90 milliseconds	5 seconds to 9 seconds in 1-second increment
100, 200,… 900 milliseconds	10 seconds to 50 seconds in 10-second increment
1, 2,3,4 seconds	1 minute to 59 minutes with 1-minute increment
	1 hour to 12 hour with 1-hour increment

If the sampling interval is four seconds or faster the logger must be powered by an external power supply during the logging period.

Making changes to the Sampling Interval will affect Total Time Span fields.

On-Board LED
Check this field to enable the on-board status LED. If the LED is enabled it will flash each time when it samples data to indicate:
1. The logging is active if the LED flashes in green.
2. The logger is in alarm state if the LED flashes in red.
3. The battery will die soon if the LED flashes in amber.

If you do not need LED indication, you can uncheck this field to increase the battery life.

When Memory Full
If you want the logger to stop logging when the memory is full select **Stop logging**. If you want the logger to continue logging and overwrite the oldest data with the new data (FIFO), you choose **Continue logging**.

Time to Start & Time to End
These two fields specify the desired time the logger will start logging data and the time to stop logging data.

Making changes to the Time to Start/End will affect Total Time Span fields mentioned later.

If you have selected the **Continue logging** field, when the memory is full, both start time and end time will move forward accordingly.

Total Time Span
These fields are an alternate way to specify the total logging time from the start time you specified above.

Changes made on these fields will affect **Time to End** field.

Channel Settings:

Enabled
Check this field to enable this channel for logging.

Channel Range
This field specifies the measurement range the channel will use. Different channel types have different input range selections. Please refer to **Channels and Sensor Connections** chapter for details.

Description
This field specifies the name or the description of the channel (maximum of 30 characters).

Equation
This field specifies the equation used for the channel. Different channel ranges have different default equations. Please refer to **Channels and Sensor Connections** chapter for details.

In order to convert a process signal to a correct measurement value an equation must be applied to the channel.

For example, if you want to use the 0 – 5 VDC channel to record a battery voltage output, the logger will first convert the battery voltage values to digital values and save them in the memory. Later when all data are downloaded to a computer, Accsense VersaLog will use equation "VoltageDC" to convert the digital values back to voltage values.

If you are recording the voltage output of a transducer or transmitter and the range of the voltage refers to another measurement unit, you will need to create your own equation for this conversion. For instance, if your CO2 transducer outputs 0 – 5VDC representing 0 – 5000PPM of CO2, the custom equation you need to create looks like this:

```
public double CO2Equation(double Input)
```

```
{
        double output;
        output = 5000 * Input  / 5 ;
        return output;
}
```

For detailed instructions on how to create a custom equation please refer to the **Accsense VersaLog User's Manual** available for download online.

Cali. Low & Cali. High
These two fields specify the custom calibration values that are used for measurement adjustment.

The Cali. Low value specifies the digital value that is over zero when the input value is in the low range value (for 0 – 5 VDC channel the low range is zero volt). The equation will subtract this value from the original digital value when doing the conversion.

The Cali. High value specifies the digital value that is over 65535 when the input value is in the high range value (for 0 – 5VDC channel the high range is 5 volt). The equation will subtract this value from the original digital value when doing the conversion.

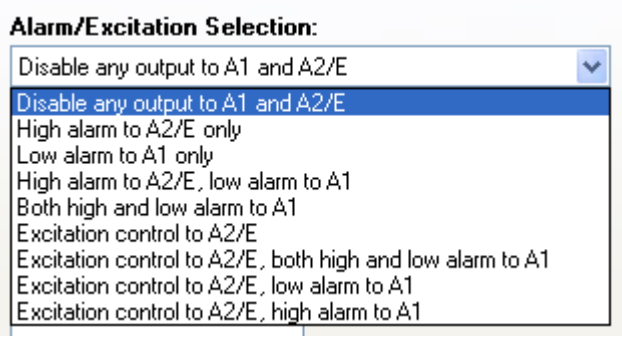
The valid range for these two parameters is from –32768 to 32767.

These two parameters for each channel were originally set to zero when the logger was first released.

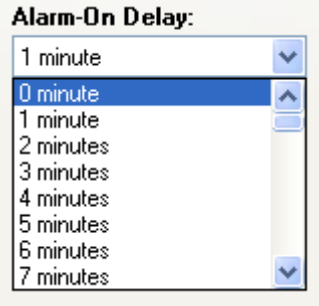
If you have finished the **Cali. Low** and **Cali. High** calibration instructed in the later chapter, the "Cali. Low" and "Cali. High" values may be readjusted.

Alarm and Excitation:

Alarm/Excitation Selection
This field specifies how Alarm1 and A2/E terminals are being controlled by alarm state and/or excitation settings. Available settings are:

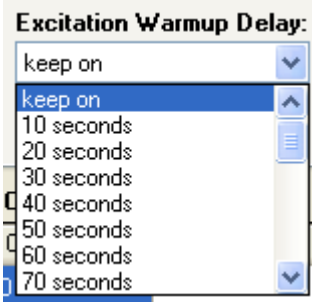


Alarm-On Delay
This filed specifies a time delay before sending out alarm notification if there is an alarm.



Excitation Warm-up Delay

This field specifies how much delay will be put after the excitation terminal is activated and before the logger is taking the sample.

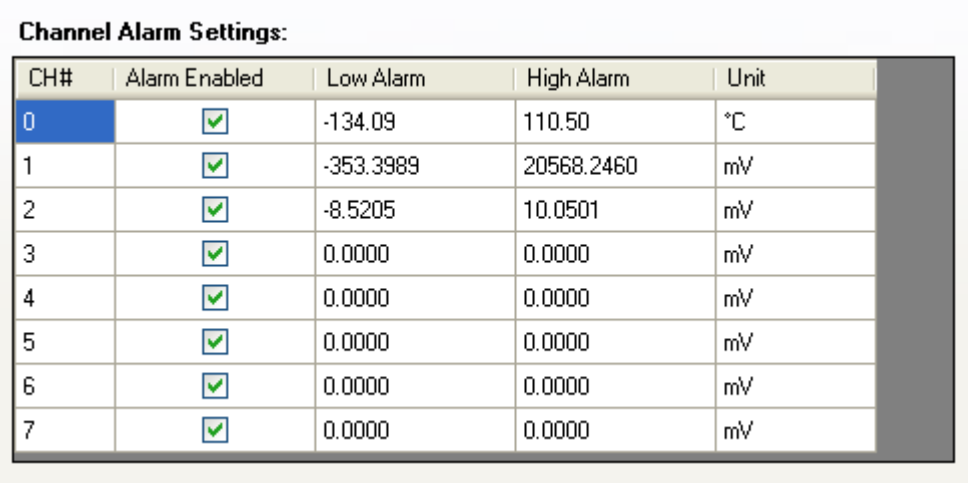


Channel Alarm Settings

This table specifies how each channel controls alarm state by:

Alarm Enabled: Check this field to associate this channel to the alarm state.

Low & High Alarm: These fields define the alarm thresholds. If the reading is beyond these thresholds, the alarm is triggered.



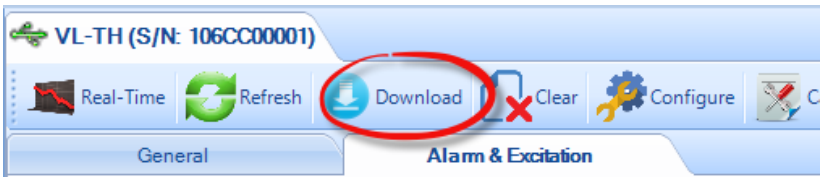
Once you have finished making changes to the available settings, you can click **OK** button to save the settings to the logger. The logger will start to record data from **Time to Start** you have set.

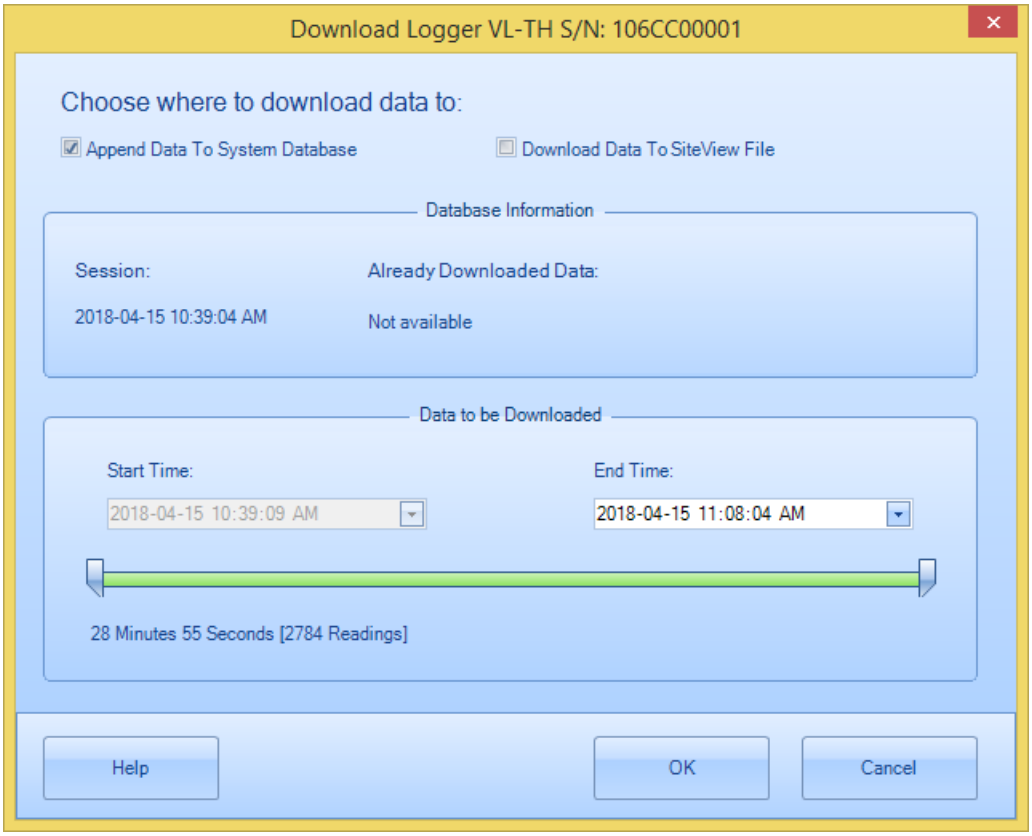
Note: clicking on OK or Apply buttons will erase all existing measurements saved in the logger.

For a detailed description of each available setting please refer to the **Accsense VersaLog User's Manual** available for download online.

Download Logger

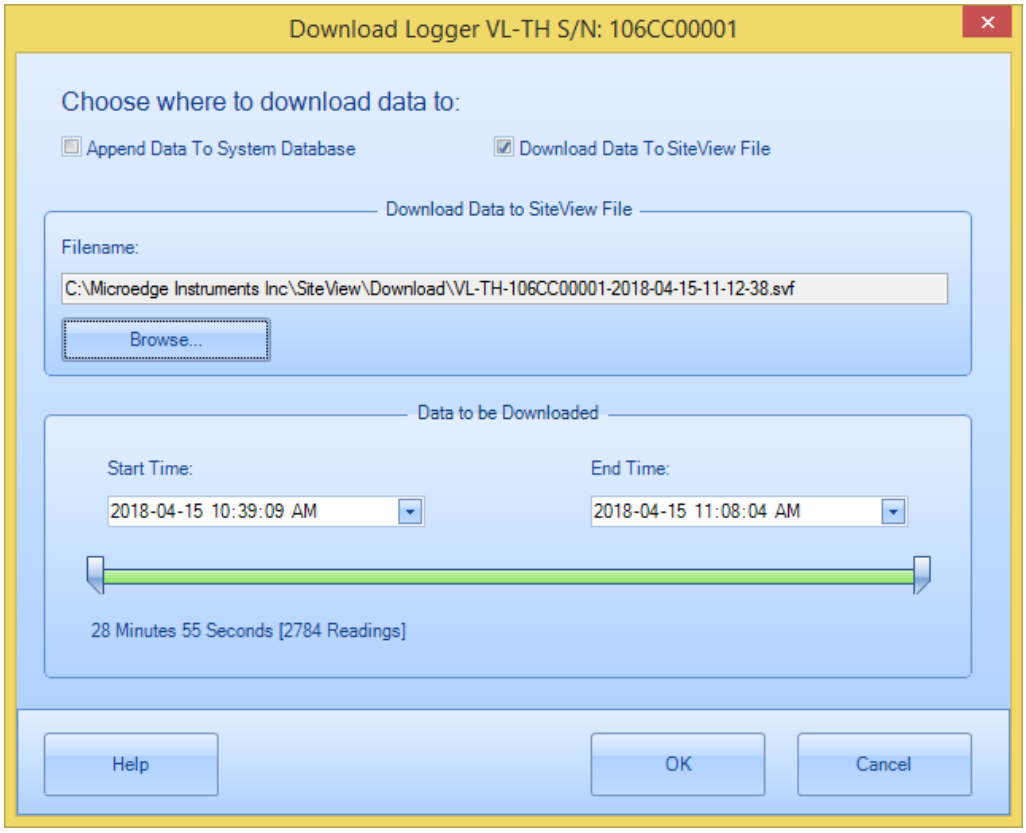
If you are already in logger status tab, clicking on "Download" button will bring up **Download** dialog window:





Started from Site View 3, data can be downloaded to the system database. Each data logger has a life-time database file associated to it. If you choose to "Append Data to System Database" you can specify End Time and start to download the data.

If you choose to download data to a separate Site View file, the user interface looks like:



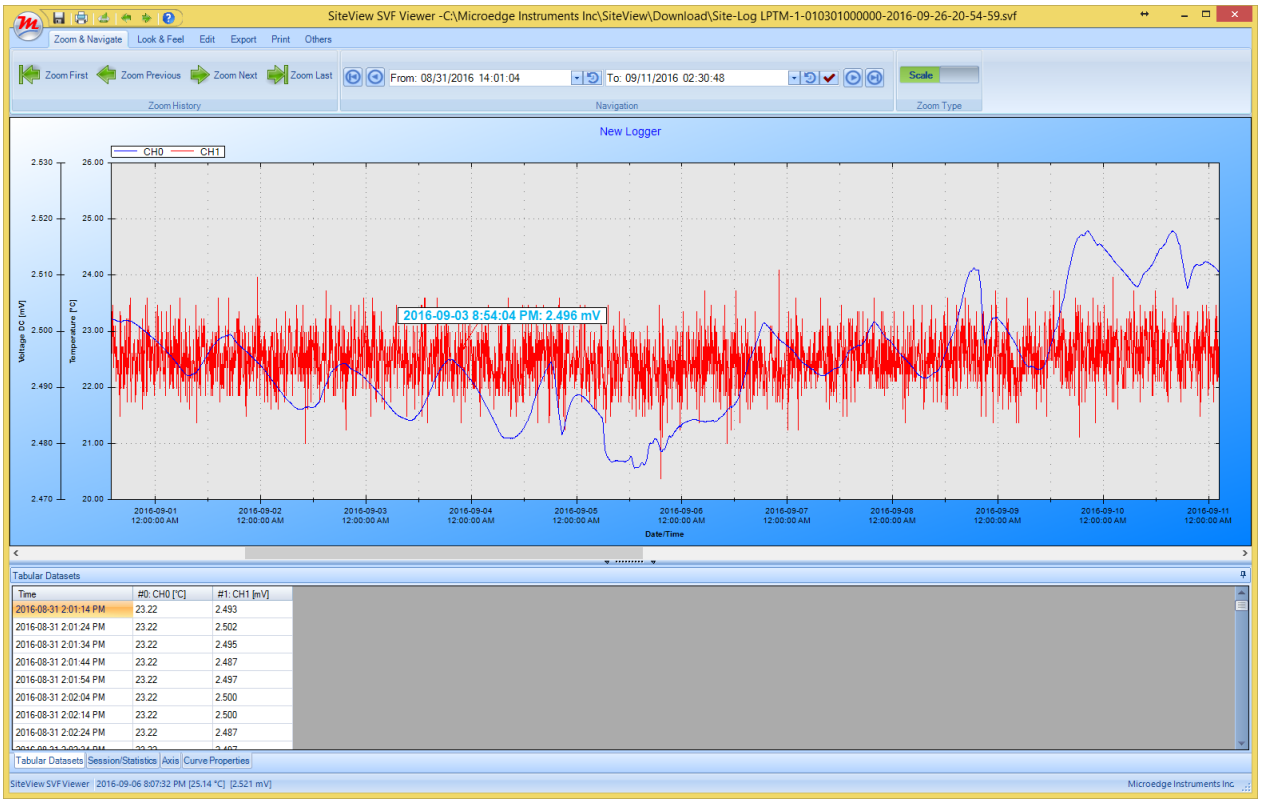
The fields that you can edit are:

Filename & Browse
These fields specify the full file path the downloaded data will be saved into.
Clicking on **Browse** button will display **File Save** dialog where you can edit or choose a file name.

Start Time & End Time
These fields specify the desired start and end time for the data to be downloaded. You can use either scroll bars or the calendar controls to change the start and end time.

Once you have selected a desired time frame you can click **OK** button to start the download process.

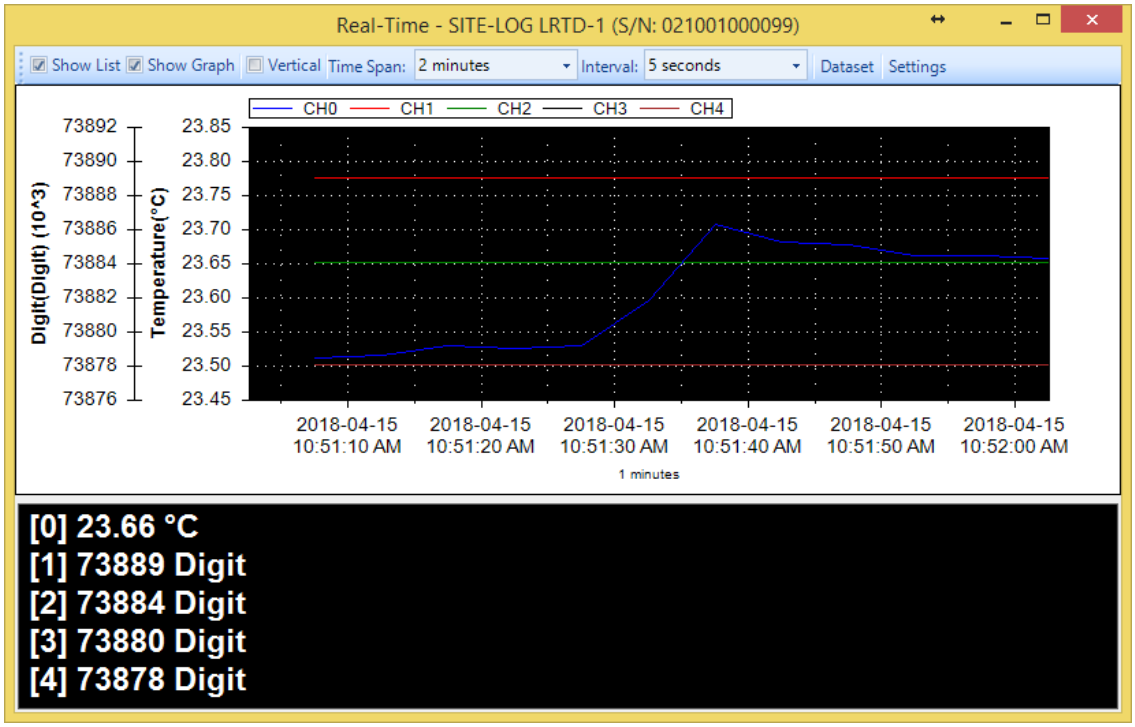
After the download the plot and tabular data will be displayed (If **Display plot after download** was not checked the plot will not display):



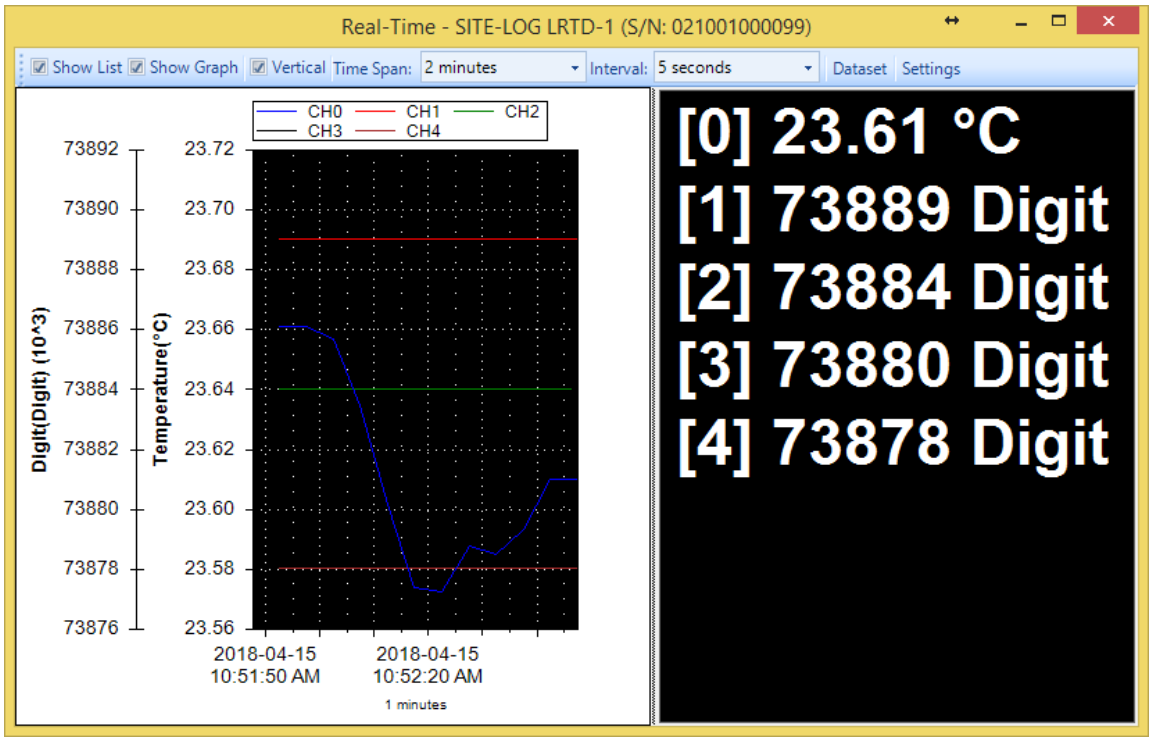
Real-Time Display

If the logger is in normal sampling mode (sampling interval is 5 seconds or longer), VersaLog SiteView can view the real-time measurements while the logger is still logging data. The real-time display shows the list of the latest channel real-time measurements, as well as the trend chart of all channel real-time measurements for the past given period of time from the current time.

To open real-time view, if the logger has been contacted and the status of the logger is displayed, click on **Real-Time** tool bar button. The following real-time dialog appears:



Real-Time in Horizontal View



Real-Time In Vertical View

Tool bar buttons:

Show List

Click to show/hide the list view panel.

Show Graph

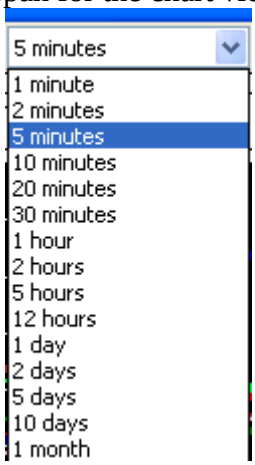
Click to show/hide the chart view panel.

Vertical

Click to display the chart and list views vertically.

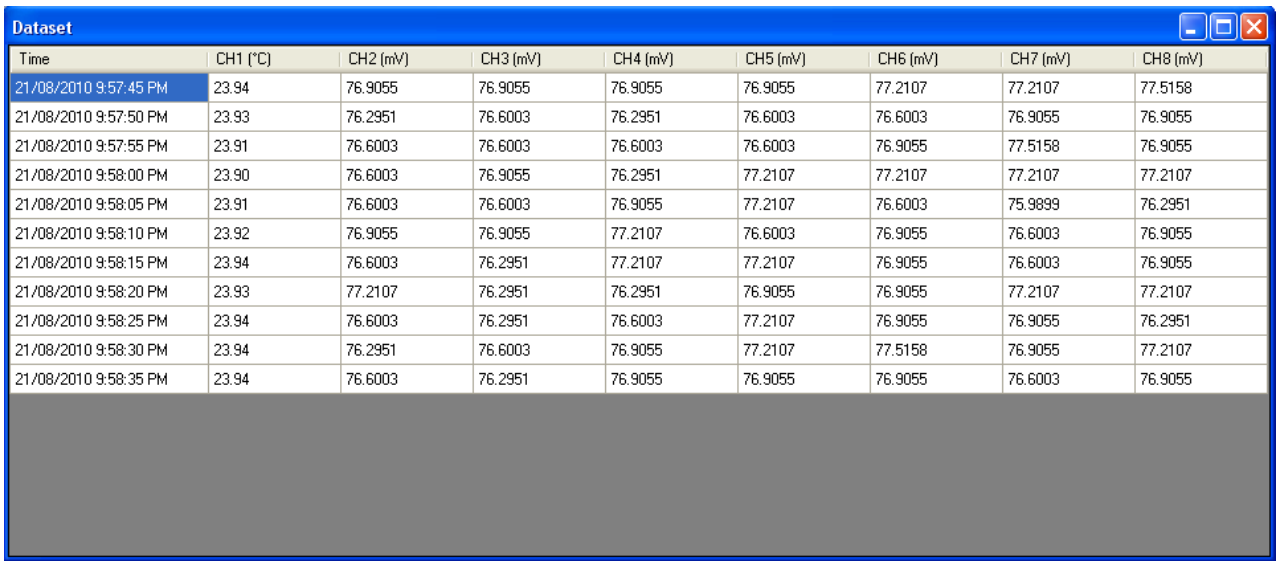
Time Span

This field allows changing the time span for the chart view. Available settings are:



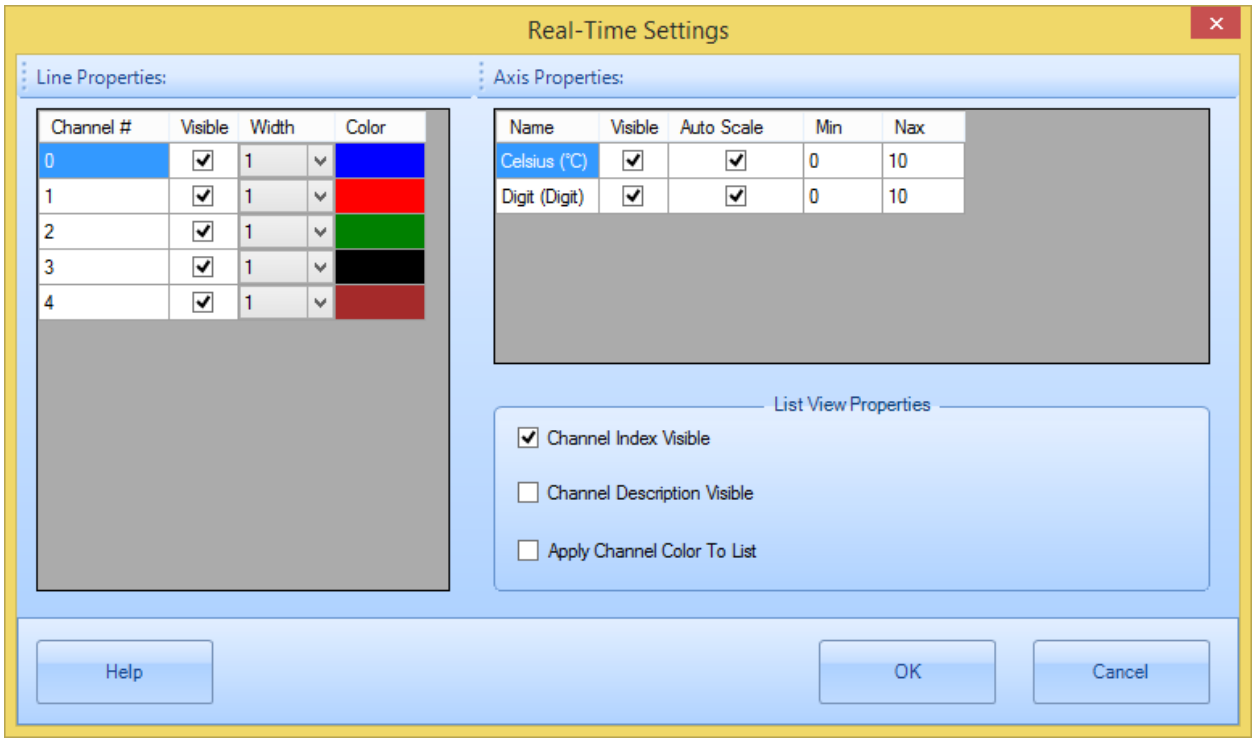
Dataset

Click to display the tabular view of the recorded measurements illustrated below:



Time	CH1 (°C)	CH2 (mV)	CH3 (mV)	CH4 (mV)	CH5 (mV)	CH6 (mV)	CH7 (mV)	CH8 (mV)
21/08/2010 9:57:45 PM	23.94	76.9055	76.9055	76.9055	76.9055	77.2107	77.2107	77.5158
21/08/2010 9:57:50 PM	23.93	76.2951	76.6003	76.2951	76.6003	76.6003	76.9055	76.9055
21/08/2010 9:57:55 PM	23.91	76.6003	76.6003	76.6003	76.6003	76.9055	77.5158	76.9055
21/08/2010 9:58:00 PM	23.90	76.6003	76.9055	76.2951	77.2107	77.2107	77.2107	77.2107
21/08/2010 9:58:05 PM	23.91	76.6003	76.6003	76.9055	77.2107	76.6003	75.9899	76.2951
21/08/2010 9:58:10 PM	23.92	76.9055	76.9055	77.2107	76.6003	76.9055	76.6003	76.9055
21/08/2010 9:58:15 PM	23.94	76.6003	76.2951	77.2107	77.2107	76.9055	76.6003	76.9055
21/08/2010 9:58:20 PM	23.93	77.2107	76.2951	76.2951	76.9055	76.9055	77.2107	77.2107
21/08/2010 9:58:25 PM	23.94	76.6003	76.2951	76.6003	77.2107	76.9055	76.9055	76.2951
21/08/2010 9:58:30 PM	23.94	76.2951	76.6003	76.9055	77.2107	77.5158	76.9055	77.2107
21/08/2010 9:58:35 PM	23.94	76.6003	76.2951	76.9055	76.9055	76.9055	76.6003	76.9055

Settings
Click to display more properties illustrated below:



For detailed instructions on how to change real-time view settings please refer to **Accsense VersaLog Instruction Manual** available for download online.

Calibrate a Channel

VersaLog SiteView software provides two-point calibration for most of the loggers.

Understand Cali. Low & Cali. High
In the logger status page, there are two properties for each listed channel called **Cali. Low** and **Cali. High**. These two fields specify the calibration values that are used for measurement adjustment.

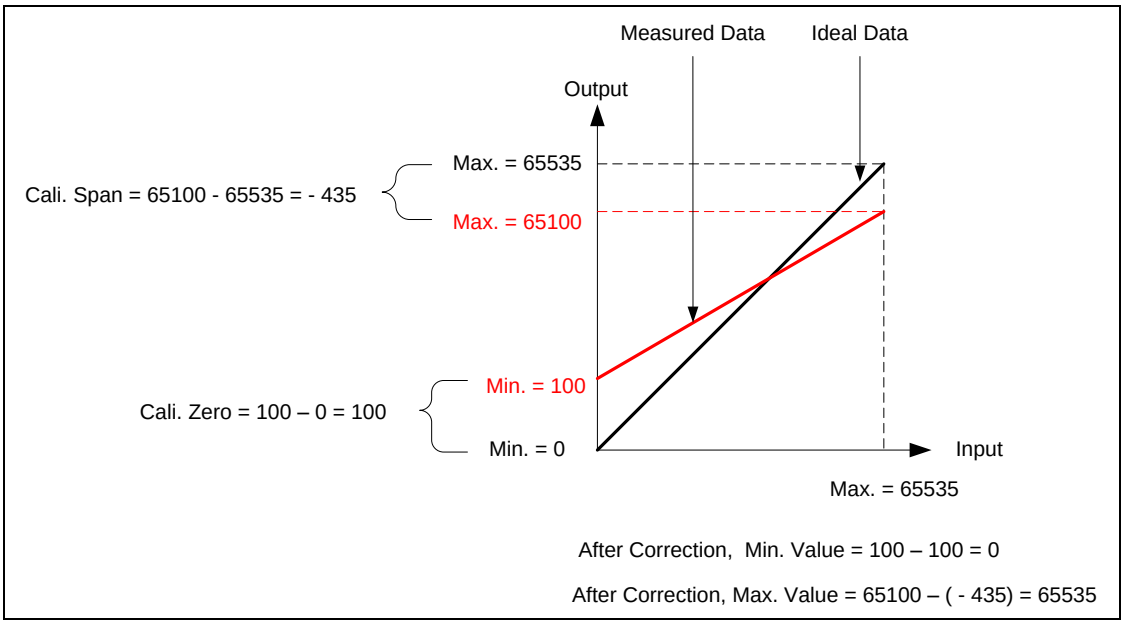
Cali. Low value specifies the digital value that is over zero when the input value is the lowest value (for 0 – 5 VDC channel the lowest value is zero volt). For instance, if you apply zero volt input and the logger measured 100 as the digital value, then **Cali. Low** should be 100 digits. The equation entity will subtract this value when resolving the correct lowest digital value.

Cali. High value specifies the digital value that is over 65535 when the input value is the highest value (for 0 – 5VDC channel the high range is 5 volt). For instance, if you apply 5 volt voltage to the channel and the logger measured 65100 as the digital value. Then **Cali.**

High is "- 435" (calculated from 65100 – 65535). The equation entity will subtract this value (-435) from the digital value when resolving the highest digital value.

The valid range for these two parameters is from –32768 to 32767.

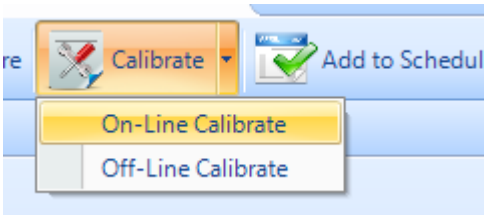
The following figure illustrates the relationship between an ideal data line and a measured data line and how **Cali. Low** and **Cali. High** correct the measured data line.



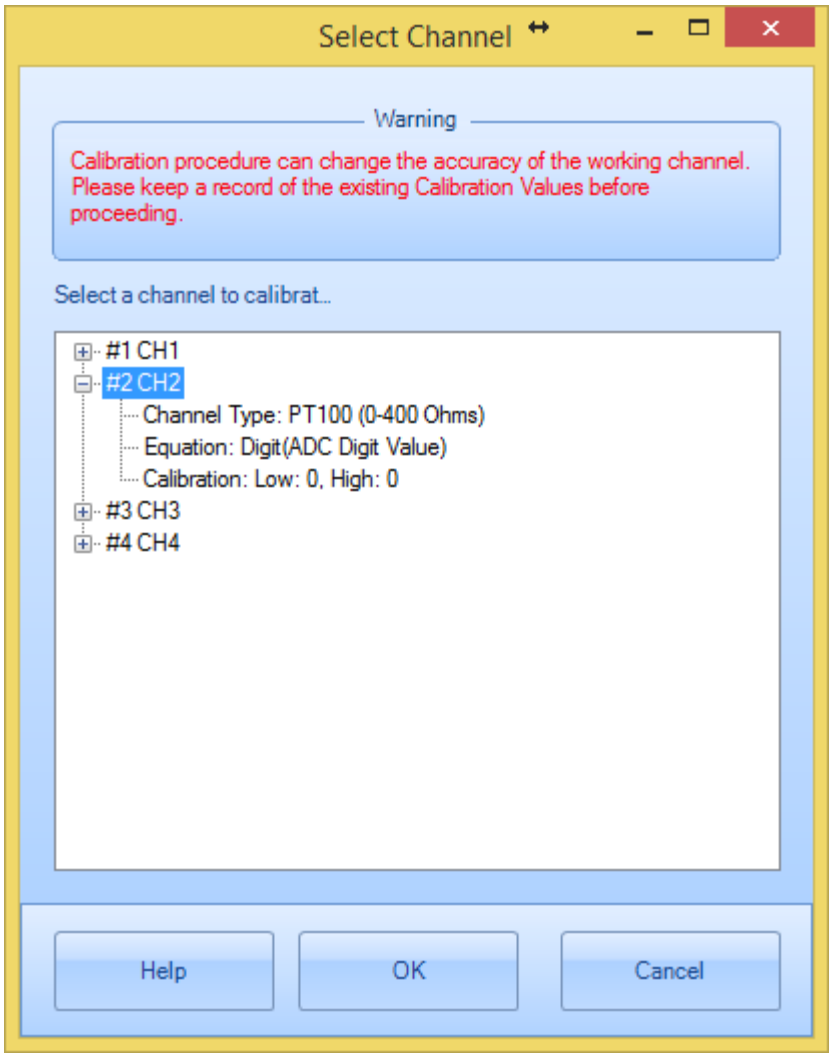
Decide On-Line or Off-Line Calibration

If the source signal like voltage or current can be connected to the logger while the logger is connecting to the computer, you can calibrate the logger on-line. If the source signal like a temperature or relative humidity is not available for on-line calibration, you can calibrate the logger off-line after the logger has recorded the low and high point data.

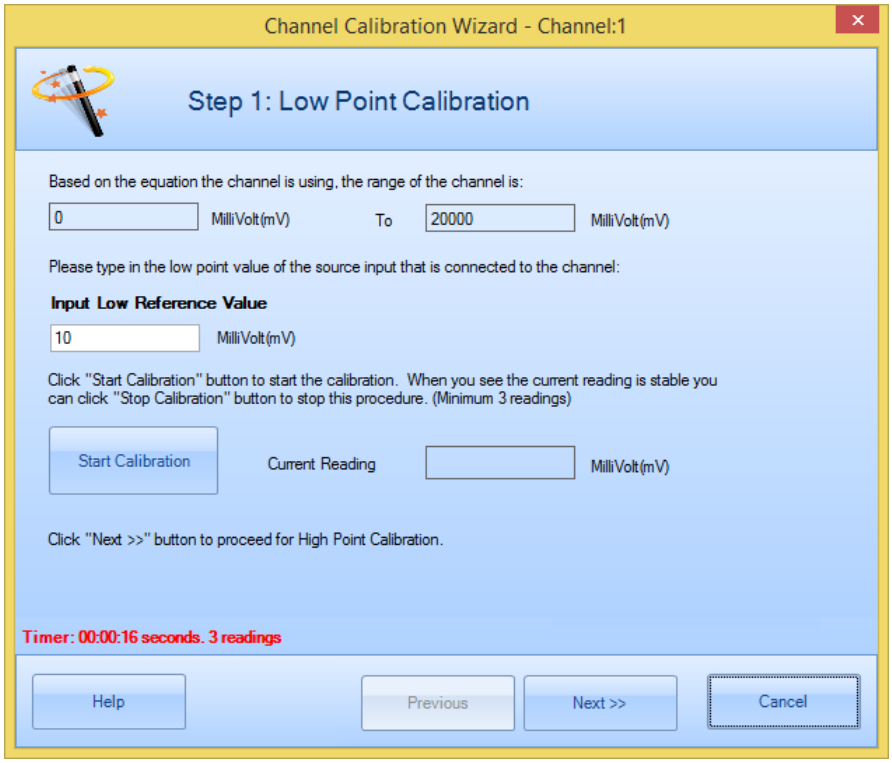
You access On-Line / Off-Line Calibration via Calibrate button on the logger status tool bar.

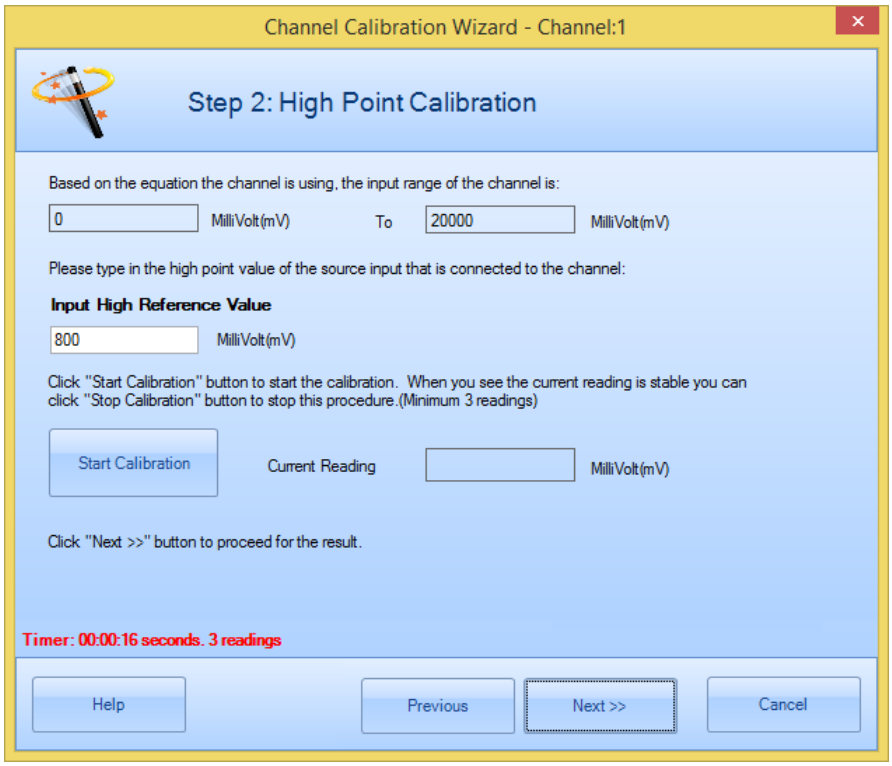


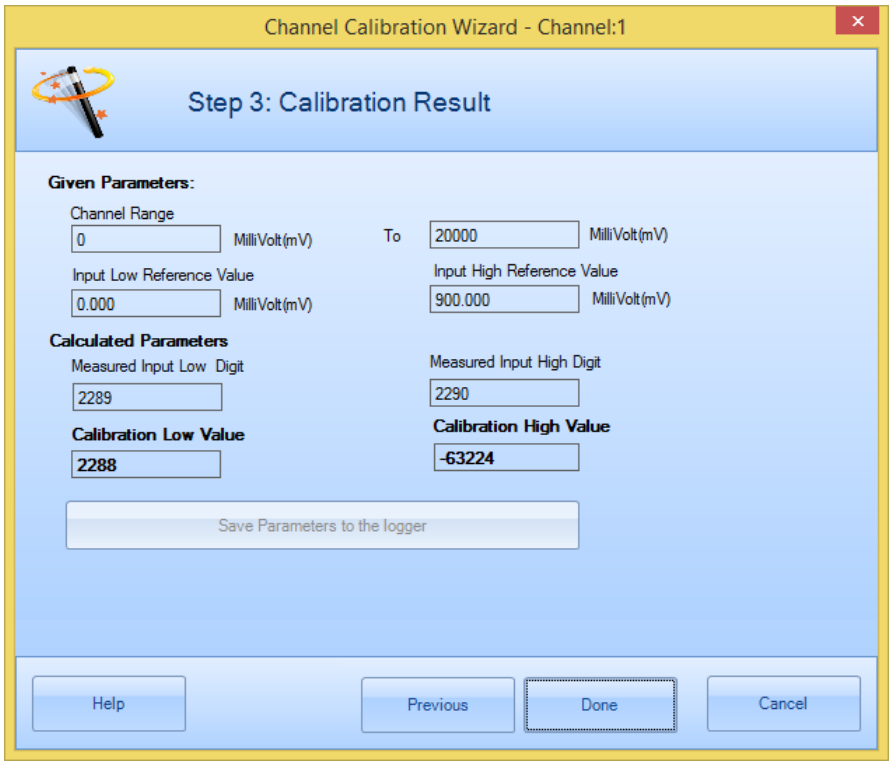
The following dialog appears:



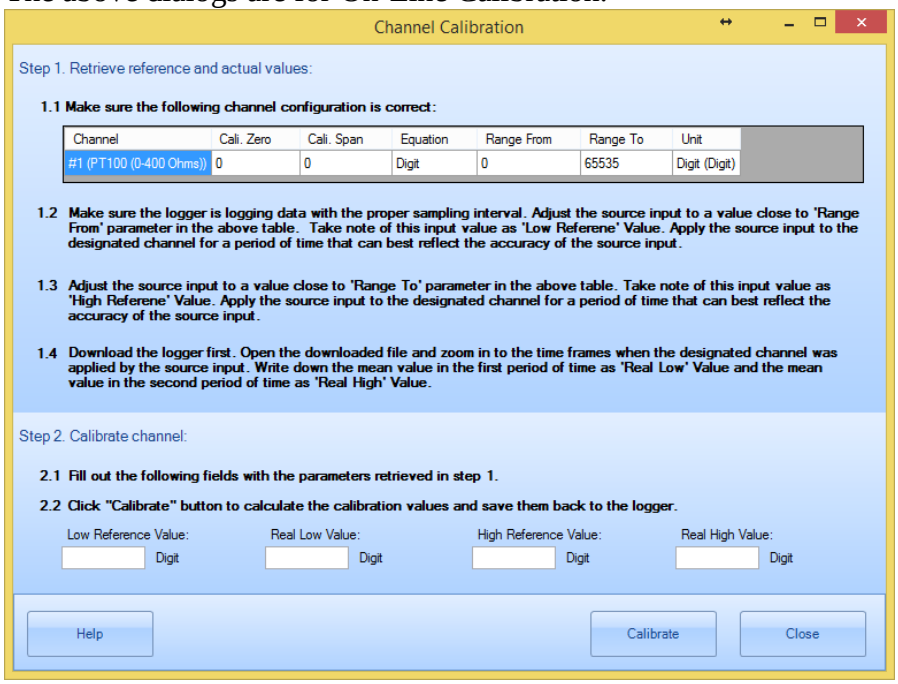
Select the channel you want to calibrate on and click **OK** button. The calibration dialogs appear as follows:


Channel Calibration Wizard - Channel:1
Step 1: Low Point Calibration
Based on the equation the channel is using, the range of the channel is:
0
MilliVolt(mV)
To
20000
MilliVolt(mV)
Please type in the low point value of the source input that is connected to the channel:
Input Low Reference Value
10
MilliVolt(mV)
Click "Start Calibration" button to start the calibration. When you see the current reading is stable you can click "Stop Calibration" button to stop this procedure. (Minimum 3 readings)
Start Calibration
Current Reading
MilliVolt(mV)
Click "Next >>" button to proceed for High Point Calibration.
Timer: 00:00:16 seconds. 3 readings
Help
Previous
Next >>
Cancel


Channel Calibration Wizard - Channel:1
Step 2: High Point Calibration
Based on the equation the channel is using, the input range of the channel is:
0
MilliVolt(mV)
To
20000
MilliVolt(mV)
Please type in the high point value of the source input that is connected to the channel:
Input High Reference Value
800
MilliVolt(mV)
Click "Start Calibration" button to start the calibration. When you see the current reading is stable you can click "Stop Calibration" button to stop this procedure.(Minimum 3 readings)
Start Calibration
Current Reading
MilliVolt(mV)
Click "Next >>" button to proceed for the result.
Timer: 00:00:16 seconds. 3 readings
Help
Previous
Next >>
Cancel



The above dialogs are for On-Line Calibration.



The above dialog is for Off-Line Calibration.

Please refer to **Calibrate Logger** chapter in **Accsense VersaLog User's Manual** for details.

6. Specifications

Common Specifications

Alarm	
Channel Alarms	Two editable alarm thresholds per channel. Alarm controls Alarm1, A2/EXT outputs and send out over comm. interface.
Alarm Outputs	Alarm1 & A2/EXT can be configured as alarm outputs. Alarm-On: MOSFET(N-Channel) switch on Alarm-Off: MOSFET(N-Channel) switch off Max Power: 200mA @ 24VDC. With purchase of VersaLog SiteView software, Accsense VersaLog can report alarm status to host PC via USB, Modem or Ethernet Device Server.
Alarm-On Delay	Programmable 0 - 10 minutes delay with 1-minute increment.
Alarm Indicator	On-board LED lights in red when in alarm state.
On-board Memory	
Capacity	4 Mega-bytes (2 Mega measurements)
Data Retention	Over 20 years
Sampling & Logging	
Sampling Interval	20 milliseconds [1] to 12 hours, user selectable.
Logging Mode	Stop recording or FIFO when memory is full.
Logging Activation	Programmable instant, start delay or field push button activation.
Communications	
Interface	USB (Mini-USB-B) (USB-A-mini USB-B Cable included) AUX(RJ11) for direct TTL level communications With purchase of DeviceServer, Accsense VersaLog can be connected to Ethernet for remote access.
Baud Rate	Auto-detect baud rate from 2400 to 115200 bps on both USB and AUX.
Battery	
Power	Built-in 3.6V Lithium Battery.
Life Cycle	10 years for other models based on 1 minute sampling interval. 5 years for VersaLog P based on 1 minute sampling interval, normal open contact
Software	
SiteView [2]	Configuration, downloading, scheduled downloading, plotting, real-time plotting, custom calibration and custom equation
Software Requirements	Computer with 1.0 GHZ or faster processor 256 MB Memory or higher 1.0 GB of available hard-drive space or higher Windows XP with SP2 or later, Vista, Windows 7 + 8 At least one USB port or one COM port.

Physical	
Material	Aluminum Enclosure.
PCB Treatment	Conformal coating
Dimension	88 X 64.2 X 24 mm 3.46 X 2.53 X 0.95 Inches
Weight	150g
Mounting	Probe/wall-mount holes for hanging/mounting.
Others	
LED Indicator	Tri-Color LED: (can be disabled for power saving) Normal Sampling: green when sampling. Alarm: red when sampling. Low Battery: amber when sampling.
Excitation Control	A2/EXT terminal strip can be configured as excitation control output for driving the power of connected devices. Warm-up Interval settings: 10 to 240 seconds with 10-second increment.
Operating Environment	-40 ~ +70°C (-40°F to + 158°F), 0 ~ 95 %RH non-condensing.
Clock Accuracy	+/- 1 minute per month
Approvals	CE, FCC

[1]: Maximum enabled channels: 1 for 20ms interval, 2 for 30ms, 8 for 40ms or bigger interval.
[2]: Sold separately.

Logging Capacity

Sampling Interval	Enabled Channel	Logging Capacity
1 minute	1	3.98 years
1 minute	2	727 days
1 minute	8	181 days
10 seconds	1	242 days
10 seconds	2	121 days
10 seconds	8	30 days

Sampling Interval	Enabled Channel	Logging Capacity
1 second	1	24 days
1 second	2	12 days
1 second	8	3 days
100 ms	1	58 hours
100 ms	2	29 hours
100 ms	8	7.2 hours