

Features

- Fully isolated (150Vac) analog inputs
- Eliminates AC and DC common-mode related measurement problems
- 400nV resolution with 18 bit resolution
- Field programmable for thermocouples, voltage, and current without external shunts, dividers or circuitry
- User programmable filtering levels
- Low-power design for optimum battery life
- HyperLogger Module
 - Four analog channels
- ModuLogger Module
 - Four analog channels or eight channels isolated in pairs
 - Maximum of 44 input channels

**The Authority in
 Unrestricted Data
 Logging**



Isolated Analog Interface Modules

The Isolated Interface Modules provide completely isolated analog input capability and are available as plug-in modules for both the HyperLogger and ModuLogger portable data logging systems. These interface modules provide increased flexibility and simplify installations in systems where the possibility of ground loops, noise and common-mode problems may exist, making for easier and more precise measurements.

Data Logging Examples Requiring Isolation:

1. Measurement of signals shared between multiple sensors.
2. Measurements in the presence of circulating AC currents that exceed the common-mode rejection range of typical non-isolated inputs.
3. In measuring signals that have large DC offsets that exceed the common-mode input range of typical non-isolated inputs.

All channels are true differential instrumentation inputs with extremely high common-mode noise rejection. Typical portable instrumentation common-mode rejection for non-isolated inputs is less than 5 volts DC, the HLIM-7 and MLIM-7 have 150Vac and 200Vdc rejection that removes any ground loop and noise related problems. PhotoMOS and special input protection circuitry make for 150Vac of isolation and a damage resistant interface module.

The HyperLogger Interface Module, HLIM-7 and the ModuLogger Module, MLIM-7 are controlled by their own microprocessor offering 18-bit resolution and corresponding accuracy. Setup of the input channels and data logging/alarming strategy is accomplished with HyperWare™, Logic Beach's powerful icon-base programming software.



Isolated Analog Interface Modules

Typical Applications

Problem 1: An **electrical utility** needs to measure temperatures at various points within a superheater using thermocouples welded onto the superheater's piping. Within the generation facility, large AC voltage differentials, 10's of volts or greater, commonly exist although the equipment is theoretically "grounded". Feeding these signals into non-isolated inputs on conventional non-isolated instrumentation will result in erroneous readings (and possible damage) since the AC voltages superimposed on the DC signals will exceed the input range (referred to as the common-mode input range) of the instrument front end multiplexers, amplifiers, etc.

Solution: Use of a Logic Beach data logger with an isolated input module breaks the AC current path allowing accurate high-resolution measurements on very low level (microvolt) thermocouple signals.

Problem 2: In a **process plant**, measurements are required on various existing 4-20mA loops instrumented parameters (e.g. flow, temperature, pressure). Different power sources provide loop power for the various 4-20mA loops. Differential AC voltages can exist between the power supplies "common" points due to varying degrees of power supply design quality. Connecting loops directly into non-isolated inputs results in measurement errors and possible damage to the logger's inputs due to differential voltages exceeding the maximum allowable common-mode input. Additionally, inserting instrumentation at varying nodes within the loop can result in DC voltages that exceed the input common-mode input range of the instrument once again causing erroneous readings and/or permanent damage.

Solution: Utilize a Logic Beach data logger and isolated interface module to break the DC and AC current paths.

Problem 3: In the **development** of an appliance it is desired to measure various voltages around a 24VDC circuit. These include a power supply, drive motor, controller and display all in series, as well as the current in the circuit from a voltage drop across a precision shunt. Node voltages connected to the data logger will range up to 24Vdc relative to the power supply negative terminal exceeding the input common-mode range of non-isolated inputs and causing measurement errors.

Solution: Utilize an isolated interface module to provide isolated floating inputs for node voltage and current measurements.

Channel Configurations

General: All inputs can be individually field configured to accept thermocouple, Vdc and mAdc inputs directly without the addition of external shunts, dividers, temperature compensation or additional circuitry.

HyperLogger: The HLIM-7 Module has four fully isolated inputs.

ModuLogger: The MLIM-7 Module has eight inputs configured as 4 fully isolated channels with a piggyback input on each channel with a shared common. Each pair of channels is fully isolated from the other pairs, as well as other data logger circuitry. One input of each pair can accept +/-30Vdc directly.

Hyperware™ Implementation

Both the MLIM-7 and HLIM-7 modules are 100% compatible with HyperWare™ communication, programming and data analysis software. Upon data logger query, HyperWare automatically identifies and displays installed hardware. Isolated input icons are displayed for integration into a Program Net. Refer to HyperWare™ data sheet for details on the power and features of icon-based Data Logger programming.

Specifications

Channel Count:

HLIM-7: 4 isolated inputs

MLIM-7: 8 inputs, 4 fully isolated inputs or four pairs of 2 (shared common).

Input Types/Ranges:

Thermocouple Types: J, K, E, T, R and S

DC Voltage

High Range: +/-30Vdc

Low Range: +/-2.4Vdc, +/-1.2Vdc, +/-100mVdc, +/-55mVdc, +/-23mVdc

DC Current: +/-22mA, +/-11mA, +/-1mA, +/-500uA, +/- 200uA

Input Impedance:

Thermocouple/Low Vdc: >15Gigohm

30Vdc Range: >2.5Mohm

Current: 100 ohm shunt

Accuracy:

Thermocouple: +/-0.2°C to 1.0°C depending on range

DC Voltage: +/-0.03%F.S. (note 1)

DC Current: +/- (0.1% Rdg +2.5uA)

Resolution:

Signal resolution: 18 Bit or 1 part in 262,144

Thermocouple: 0.1°C

DC Voltage: <400nV on 23mV Range

<200uV on 30Vdc Range

DC Current: <100nA on 22mA Range

Common-mode Range:

150Vac, 200Vdc (note 2)

Input Protection:

Current Inputs: Fused and transient clamped

Voltage Inputs: Transient voltage clamped

Thermocouple: Transient voltage clamped

Note 1: Maximum settling time enabled.

Note 2: The ModuLogger system is designed for Class 2 inputs maximum (i.e. <32Vdc). Voltages above this level are potentially lethal.