

21X MICROLOGGER OVERVIEW

OV6. SPECIFICATIONS

The following electrical specifications are valid for an ambient temperature range of -25 to +50°C unless otherwise specified.

ANALOG INPUTS

NUMBER OF CHANNELS: 8 differential or up to 16 single-ended. Each differential channel can be configured as two single-ended channels.

CHANNEL EXPANSION: The Model AM416 Relay Multiplexer allows an additional 64 single-ended channels to multiplex into four 21X single-ended channels. Up to four AM416's can be connected to one 21X.

ACCURACY OF VOLTAGE MEASUREMENTS AND ANALOG OUTPUT VOLTAGES:

Differential and positive single-ended:
0.1% FSR (0.05%, 0-40°C)
Negative single-ended:
0.15% FSR (0.06%, 0-40°C)

RANGE AND RESOLUTION: Ranges are software selectable for any channel. Resolution for a single-ended measurement is twice the value shown.

Full Scale Range	Resolution
± 5000 millivolts	333 microvolts
± 500 millivolts	33.3 microvolts
± 50 millivolts	3.33 microvolts
± 15 millivolts	1.00 microvolt
± 5 millivolts	0.33 microvolts

INPUT SAMPLE RATES: The fast A/D conversion uses a 0.25 ms signal integration time and the slow conversion uses a 16.666 ms signal integration (one power line cycle period). Differential measurements include a second sampling with reversed input polarity to reduce thermal offset and common mode errors. Input sample rates are the time required to measure and convert the result to engineering units.

Fast single-ended voltage:	2.4 ms
Fast differential voltage:	3.7 ms
Slow single-ended voltage:	18.8 ms
Slow differential voltage:	37.0 ms
Fast differential thermocouple:	7.3 ms

INPUT NOISE VOLTAGE:

Fast differential	-- 0.82 microvolts RMS
Slow differential	-- 0.1 microvolts RMS

COMMON MODE RANGE: ± 5 volts.

DC COMMON MODE REJECTION: > 140 dB.

NORMAL MODE REJECTION: 70 dB
(60 Hz with slow differential measurement).

INPUT CURRENT: 2 nanoamps maximum.

INPUT RESISTANCE: 200 gigohms.

ANALOG OUTPUTS

NUMBER OF ANALOG OUTPUTS: 4 switched, 2 continuous.

DESCRIPTION: A switched output is active only during a measurement and is switched off (high impedance) immediately following the measurement. Only one switched output can be active at any one time. The 2 continuous outputs hold a preset voltage until updated by an analog output command.

RANGE: ± 5 volts.

RESOLUTION: 0.67 millivolts.

ACCURACY: Same as voltage input.

OUTPUT CURRENT:

Switched: 20 mA @ ± 5 V, 50 mA @ ± 2.5 V.
Continuous: same @ +V, 5 mA @ -V.

RESISTANCE AND CONDUCTIVITY MEASUREMENTS

ACCURACY: 0.035% (0.02% 0 to 40°C) of full scale bridge output, limited by the matching bridge resistors. The excitation voltage should be programmed so the bridge output matches the full scale input voltage range.

MEASUREMENT TYPES: 6-wire and 4-wire full bridge, 4-wire, 3-wire, and 2-wire half bridge. Bridge measurements are ratioetric and dual polarity to eliminate thermal emf's. AC resistance measurements use a dual polarity 0.75 ms excitation pulse for ionic depolarization, with the signal integration occurring over the last 0.25 ms.

PULSE COUNTERS

NUMBER OF PULSE COUNTER CHANNELS: 4 eight bit or 2 sixteen bit; software selectable.

MAXIMUM COUNT RATE: 2550 Hz, eight bit counter; 250 kHz, sixteen bit counter. Pulse counter channels are scanned at a maximum rate of 10 Hz.

MODES: Switch closure, high frequency pulse, and low level AC.

SWITCH CLOSURE MODE

Minimum Switch Closed Time: 3 milliseconds.
Minimum Switch Open Time: 4 milliseconds.
Maximum Bounce Time: 1 millisecond open without being counted.

HIGH FREQUENCY PULSE MODE

Minimum Pulse Width: 0.002 milliseconds.
Maximum Input Frequency: 250 kHz.
Voltage Thresholds: Count upon transition from below 1.5 V to above 3.5 V.
Maximum Input Voltage: ± 20 V.

LOW LEVEL AC MODE

(Typical of magnetic pulse flow transducers or other low voltage, sine wave outputs).
Minimum AC Input Voltage: 6 mV RMS.
Input Hysteresis: 11 mV.
Maximum AC Input Voltage: 20 V RMS.
Frequency ranges on next column.

Frequency Range:	Range
AC Input (RMS)	
20 mV	1 Hz to 100 Hz
50 mV	0.5 Hz to 400 Hz
150 mV to 20 V	0.3 Hz to 1000 Hz

(Consult factory if higher frequencies are desired.)

DIGITAL CONTROL OUTPUTS

The 21X includes 6 digital control outputs that can be set or reset on command.

OUTPUT VOLTAGES (no load): high 5 volts
± 0.1 volt; low < 0.1 volt.

OUTPUT RESISTANCE: 400 Ω.

TRANSIENT PROTECTION

All input and output connections are protected using spark gaps connected directly to a heavy copper bar on the circuit card between the two input terminal strips. The 12 volt power input and charger inputs are protected with transzorbis.

CPU AND INTERFACE

PROCESSOR: Hitachi 6303.

MEMORY: 32K ROM, 64K RAM. Standard 21X stores 19,296 low resolution data points in Final Memory.

DISPLAY: 8 digit LCD (0.5" digits).

PERIPHERAL INTERFACE: 9 pin D-type connector, storage module, modem, printer, cassette, and RS-232 adapter. Baud rates selectable at 300, 1200, 9600 and 76,800.

CLOCK ACCURACY: ± 1 minute per month.

MAXIMUM PROGRAM EXECUTION RATE: System tasks initiated in sync with real-time up to 80 Hz. One measurement with data transfer is possible at this rate without interruption.

SYSTEM POWER REQUIREMENTS

VOLTAGE: 9.6 to 15 volts.

TYPICAL CURRENT DRAIN: 1.0 mA quiescent, 25 mA during processing, and 60 mA during analog measurement.

INTERNAL BATTERIES: The 21X is powered by 8 Alkaline "D" cells with 7 Ahr capacity. The Model 21XL includes sealed rechargeable batteries with 2.5 Ahr capacity per charge. The 21XL batteries are recharged from an external 15 to 30 VDC source (e.g., solar panel, external battery, or included 110 VAC to 16 VDC wall transformer).

EXTERNAL BATTERIES: Any 12 volt battery can be connected as a primary power source; the internal batteries provide backup while the external batteries are changed.

PHYSICAL SPECIFICATIONS

SIZE: 8.2" X 5.7" X 3.3". Input terminal strips extend 0.45" above the panel surface.

WEIGHT: 6.2 lbs.

WARRANTY

Three years against defects in materials and workmanship.