

HL20-A Measurement and Control System



HL20-A data acquisition system is a powerful data acquisition system suitable for various applications including meteorology, hydrology, ambient air pollution, agriculture, industry, wind and solar power energy, water quality & resource, ground water, soil erosion research, debris flow, geotechnical measurement, etc. Due to its high data capacity (data storage capacity of EEDSU unit is $> 350,000,000$ data points), which is helpful for site where has no telecommunication link or frequent data retrieval on-site is difficult or long term data storage is required.

FEATURES :

- 20 single-ended or 8 differential analog input channels, expandable to more than 200 input channels with multiple CEM416A channel expansion modules
- 4 excitation voltage outputs
- External type of 2 switched 12 VDC output unit (Option)
- 4 pulse input channels
- 6 digital control outputs
- Optional EEDSU data storage unit ($>350,000,000$ data points)
- High flexibility for various types of sensors
- Low power consumption

The HL20-A data acquisition system consists of a HL20 datalogger, P12RB AC/DC power supply plus a power pack, a RS232 converter interface, EEDSU data storage unit and an ISO 9001 environmental Enclosure, etc. The HL20 datalogger can provide excitation voltage outputs for sensors while scanning, which absolutely save power consumption and keep system running more longer at sites where have no AC power sources. The data either be stored in internal storage can be directly retrieved by PC through a PC cable, or a removable SD card (in EEDSU data storage unit) which can be read on site by a notebook PC or brought back to office and read by a desktop PC.

User programming of HL20 is easily accomplished through an IBM compatible PC with datalogger support software. The wiring diagram and comprehensive on board instruction table as program example are included, which can be programmed to perform calculations on any desired channel. Also, the offered program example can be modified easily through datalogger support software.

Monitoring Stations Examples

A. Weather Station for Agricultural Researches:

There were 10 weather stations installed from east to south of Taiwan located in Tai-Tong, Pin-Tong and Kaohsiung counties. And each stations for agricultural research is including wind speed, wind direction, air temp. & humidity, solar radiation, net radiometer, rain gauge, etc.



B. Weather Station for Climate Change Researches:

Each weather stations installed on higher mountains of China for climate change research is including wind speed, air temp. & humidity, solar radiation, net radiometer, quantum sensor, barometric pressure, red/far red sensor, pyrgeometer, soil temp., soil heat flux, soil moisture, snow depth and rain gauge, etc.



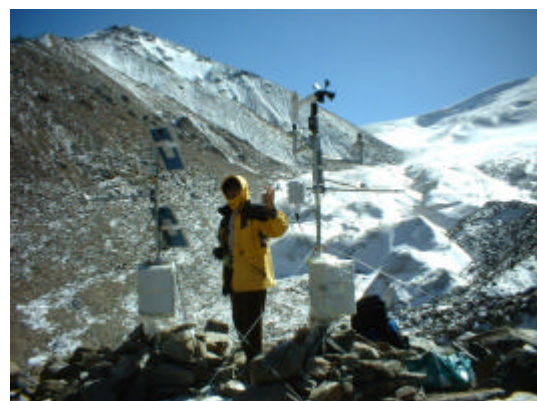
C. Weather Station for Environmental Research and Study:

The weather station installed in an industrial park in Hanoi of Vietnam for environmental research and study is including wind speed, wind direction, air temp. & humidity, solar radiation and rain gauge, etc.



D. Weather Station for Agricultural Researches:

The weather station installed in Santiago city of Chile for agricultural research is including wind speed, air temp. & humidity, solar radiation, quantum sensor, leaf wetness, soil temp. and rain gauge, etc.



E. Weather Station for Climate Change Researches:

Each weather stations installed on higher iced mountains with sea level above 4,300 M in China for climate change research is including wind speed, wind direction, air temp. & humidity, solar radiation, UVA, UVB, albedometer, barometric pressure, soil temp., snow depth and rain gauge, etc.

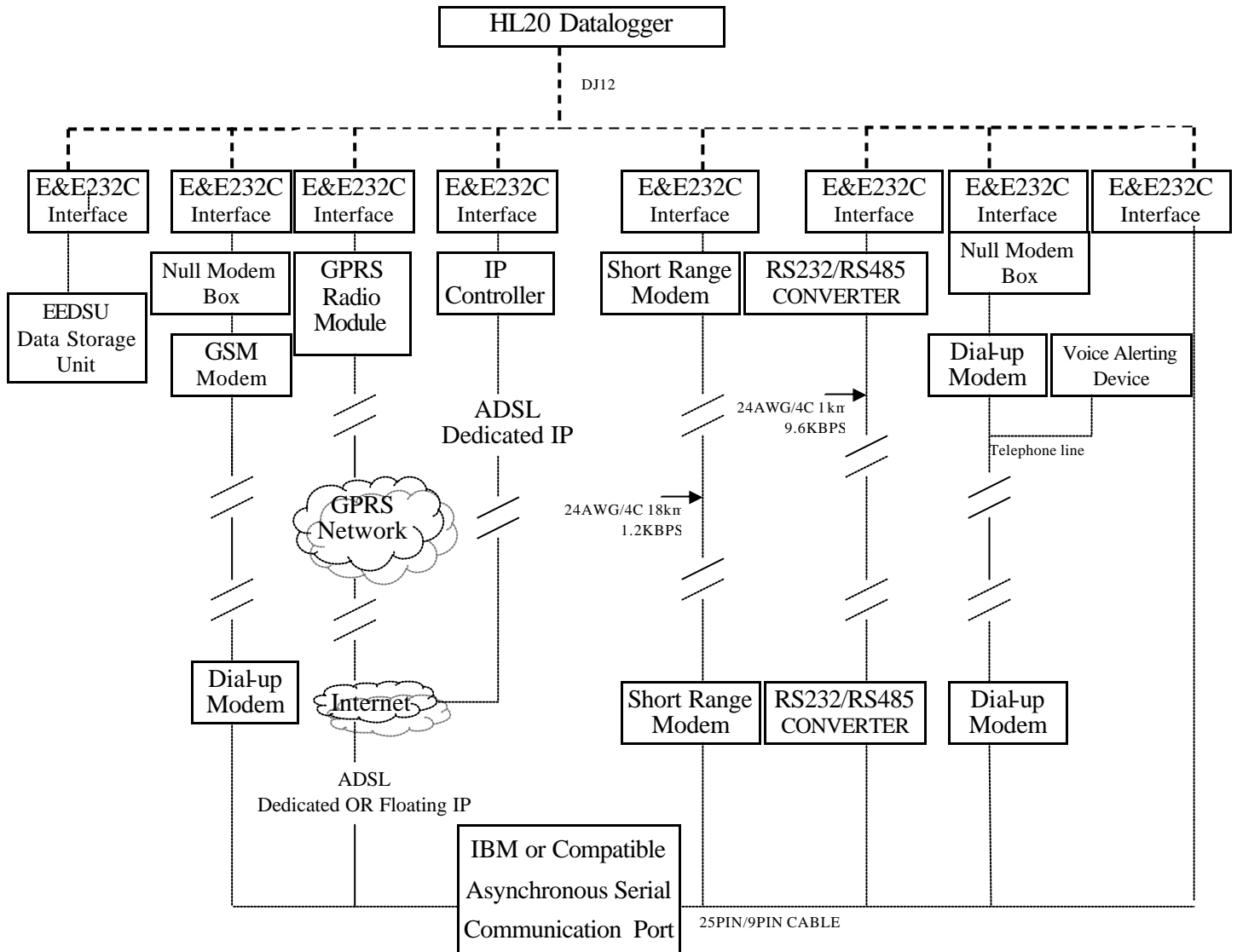


F. Hydrological Station on Bridge:

The hydrological station installed in Chang-Hua county of Taiwan is including submersible pressure transducer for water level and rain gauge for long term monitoring of water level and rain fall, etc.

DATA COMMUNICATION PERIPHERALS

FOR HL20 DATALOGGER



CHANNEL EXPANSION AND SWITCHED 12V UNIT

HP2



- Supports 2 switched 12VDC outputs

CEM416A



- **Supports:**
 - 16 input channels-full bridge.
 - 48 single-ended or 32 differential input channels.
 - 32 watermark sensors.
 - Others.



TECHNICAL SPECIFICATIONS:

Electrical specifications are valid over a -25 ° to +60 ° range, non-condensing environment required.

1. ANALOG INPUTS:

- A. Supports 20 single-ended or 8 differential (i.e. 1-16 single-ended can be configured as 1-8 differential). Each differential channel can be configured as two single-ended channels.
- B. Model CEM416A channel expansion module allows an additional 64 single-ended channels multiplex into four HL20 single-ended channels. Several channel expansion modules can be connected with HL20.
- C. Accuracy: $\pm 0.1\%$ of FSR (-25 ° to +60 °); $\pm 0.05\%$ at 25 °
- D. Four software selectable ranges: $\pm 1\text{mV}$, $\pm 10\text{mV}$, $\pm 100\text{mV}$, $\pm 1000\text{mV}$.

Full scale range Input range	Resolution	
	(Dif.)	(S.E.)
$\pm 1\text{mV}$	0.25 μV	0.5 μV
$\pm 10\text{mV}$	2.5 μV	5 μV
$\pm 100\text{mV}$	25 μV	50 μV
$\pm 1000\text{mV}$	250 μV	500 μV

- E. Input resistance: > 2 Giga Ohms.

2. PULSE INPUTS:

Supports 4 pulse inputs including low level AC, fast & low switch closure signals.

A. Switch closure mode

Minimum Switch Closed Time: 5ms

Minimum Switch Open Time: 6ms

Maximum Bounce Time: 1ms open without being counted

B. Low level AC mode

(Typical of magnetic pulse flow transducers or other low voltage, sine wave outputs).

Input Hysteresis: 15mV

3. EXCITATION VOLTAGE OUTPUTS:

Supports 4 programmable switched analog outputs.

- A. Range: 0 - 3800mV (Gradient: 1mV).

- B. Resolution: 1mV

- C. Accuracy: $\pm 1\text{mV}$ (0 ° to + 40 °);
 $\pm 5\text{mV}$ (-25 ° to + 60 °)

- D. Switched timing can be set by program, non-active outputs are high impedance.

4. CONTINUOUS 12VDC OUTPUTS:

- A. Supports 3 continuous 12VDC outputs, the output level are same as battery output, normally is around 12VDC.
- B. External 2 switched 12VDC outputs unit HP2 (option) can be set by program to switch (control) 12VDC outputs, non-active outputs are high impedance. The active power consumption of HP2 unit is 0.05mA (no load).

5. CONTINUOUS 5VDC OUTPUTS:

Supports 2 continuous 5VDC outputs, the output ranges are 5VDC \pm 0.1VDC.

6. DIGITAL CONTROL PORTS:

Supports 6 digital control outputs.

- A. Output ranges: high 5VDC \pm 0.1VDC, low<0.1VDC.
- B. Control outputs timing can be set by program.
- C. Res. SDI ports.

7. CPU AND INTERFACE:

- A. CPU: Philips 89C51RD+ or equivalent
- B. Memory: 24K for system program, > 16,000 data points of memory capacity. Optional EEDSU data storage unit included with a 2GByte SD card can store more than 350,000,000 data points.
- C. Peripheral interface: 9 pin D-type connector and RS232 converter interface.
- D. Baud rates: selectable from 600 to 9600bps, ASCII communication protocol is one start bit, one stop bit, eight data bits (no parity).
- E. Clock accuracy: \pm 1 minute per month.

8. PROGRAM CONFIGURATION:

- A. Output time interval: 1sec to 1439 minutes.
- B. Output processing: average, max., min., sample, wind vector, totalize, etc.
- C. Data output format: year, month-day, hour-minute and data, no transformation required (e.g. Julian day to Date).

9. SYSTEM POWER REQUIREMENTS:

- A. Voltage: 8 - 15VDC
- B. Power consumption: static approx. 1mA, active- depending on instructions and parameters used.
- C. Batteries: Any 12VDC battery can be connected as a primary power source, multiple 12VDC batteries can be shunted.

10. PHYSICAL DIMENSION:

L: 23.2cm * W 10.2cm * H 8.2cm.

11. ENVIRONMENTAL ENCLOSURE SPECIFICATIONS:

- A. Size: 38cm (L) * 28cm (W) * 18cm (H).
- B. Grade: ISO 9001 APPROVED.