HL20 Measurement and Control System

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The HL20 datalogger 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. It can work as a stand-alone station or be operated and controlled by remote IBM compatible PC or through dedicated line, dial-up modem or GSM modem or Internet as a monitoring systems network.

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
- ※ External 512K solid state storage module (>260,000 data points)
- ※ High flexibility for various types of sensors
- ※ Low power consumption

The HL20 measurement and control system consists of an ISO 9001 approved environmental enclosure, a HL20 datalogger, a P12RB AC/DC power with built-in 7AH rechargeable battery, RS232 converter interface, datalogger support software, 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 removable solid state storage module which can be brought back to office to retrieve data by desktop PC.

User programming of HL20 is easily accomplished through an IBM compatible PC with datalogger support software (On-line help). 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:

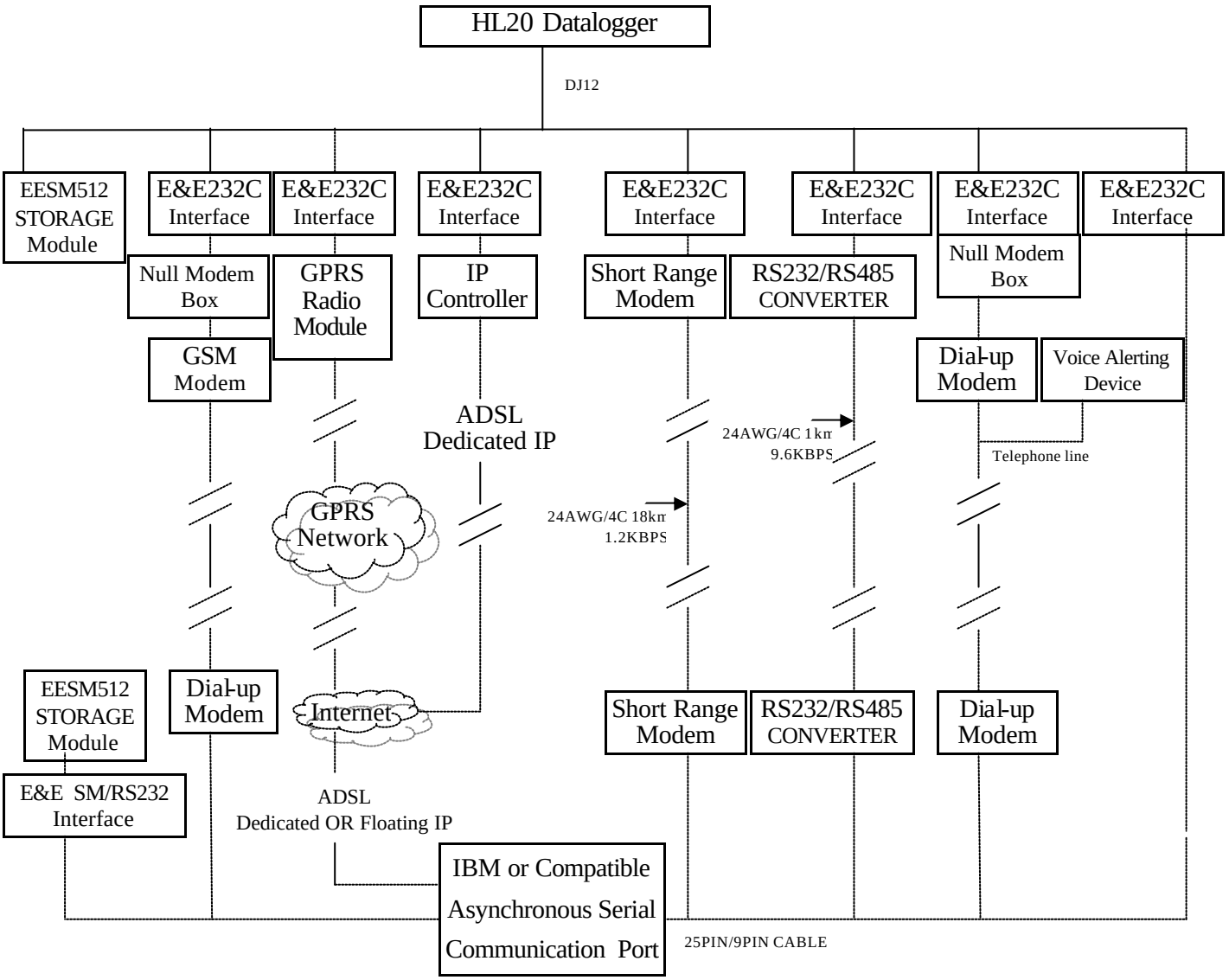
Each weather stations installed on higher iced mountains with sea level above 4,300 M in China for climate change research is including wind speed, wind direction, air temp. & humidity, solar radiation, UVA, UVB, albedometer, barometric pressure, soil temp., snow depth and rain gauge, etc.

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°C 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: ±0.1% of FSR (-25°C to +60°C); ±0.05% at 25°C
   D. Four software selectable ranges: ±2mV, ±20mV, ±200mV, ±2000mV.

Full scale range	Resolution	
Input range	(Dif.)	(S.E.)
±2mV	0.25 µV	0.5 µV
±20mV	2.5 µV	5 µV
±200mV	25 µV	50 µV
±2000mV	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: ±2mV (0 °to + 40°C);
      ±5mV (-25 °to + 60°C)
   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 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 ±0.1VDC.

6. DIGITAL CONTROL PORTS:
   Supports 6 digital control outputs.
   A. Output ranges: high 5VDC ±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 512K solid state storage module can store up to 260,000 data points.
   C. Peripheral interface: 9 pin D-type connector for storage module, modem, RS232 converter interface, etc.
   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: ±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.