



Emmet-100 Suite Meteorological Station

SPECIFICATIONS:

Enclosure

Cabinet

AL-131 Series 316 Stainless Steel Enclosure with sloped roof to deter extreme rain and heat

Telemetry

GSM Packet Data Modem - RV50

Data Logger & Software

Campbell Scientific CR1000X
Campbell PC200W software
Loggernet software available upon request

Instrumentation

Precipitation:

Hyquest TB4 0.2mm Tipping Bucket Rain Gauge

Wind Speed & Direction:

RM Young 05103 including cross-arm and cable

Temperature & Humidity

VIASALA HMP60L including RAD06 Shield

Solar Radiation

KIPPS and ZONEN SP LITE2 & brackets

Barometric Pressure

Setra 208

ABOUT:

The Emmet-100 Suite Climatological Station is our Professional Meteorological Monitoring Suite

FEATURES:

- Tripod or Tower (optional)
- Prewired Stainless Steel Enclosure
- Solar Power Supply
- High Quality Sensors
- Campbell Scientific CR1000X Data Logger
- 4G Packet data modem
- Antenna equipment
- Lightning protection
- Grounding kit
- Meteorological monitoring Instrumentation

APPLICATIONS:

- Dam reservoir rainfall & climatic monitoring
- Catchment rainfall & climatic monitoring
- General Meteorological monitoring



ENCLOSURE

CABINET

316 STAINLESS STEEL ENCLOSURE WITH RAIN ROOF



316 Stainless Steel Enclosure 400Hx-400Wx200D 30 Degree Sloping Roof

Includes:

- Insect screened ventilation top & bottom alternate sides
- Powder Coated backing board
- All wiring
- Glands
- Fuses
- Ducting
- Wiring diagram
- Optional front panel display

SOLAR POWER SUPPLY

- Solar panel 12V - 20W
- Solar regulator - 12V 6A
- Batteries - 12V 28Ah Sealed Lead Acid
- Solar panel frame and clamps

TELEMETRY

GSM PACKET DATA



Packet Data 3G/4G Modem with Ethernet Port connectivity to Campbell CR1000X Proven in Indonesia.

Network Technology	4G with automatic fallback to 3G and 2G).
RF Connectors	3 female SMA jacks (for primary cellular and optional diversity cellular and GPS).
Operating Temperature Range	-30° to +70
Host Interface	> 10/100/1000 Ethernet RJ45 > RS-232 Serial DTE D89 Female > USB 2.0 Micro-8
Dimensions	11.9 x 9.4 x 3.4 cm (4.69 x 3.7 x 1.34 in)
Weight	320 b (11.3 oz)



DATA LOGGER

SPECIFICATIONS

Operating Temperature Range	-40° to +70°C (standard)
Analog Inputs	16 single-ended or 8 differential (individually configured).
Pulse Counters	10 (P1 to P2 and C1 to C8)
Voltage Excitation Terminals	4 (VX1 to VX4)
Communications Ports	<ul style="list-style-type: none"> • Ethernet • USB • CS I/O • RS-232 • CPI • RS-485
Data Storage Ports	microSD
Switched 12 Volt	2 terminals
Digital I/O	8 terminals (C1 to C8) configurable for digital input and output includes status high/low, pulse width modulation, external interrupt, edge timing, switch closure pulse counting, high frequency pulse counting, UART, RS-232, RS-485, SDM, SDI-12, 12C, and SPI function. Terminals are configurable in pairs for 5 V or 3.3 V logic for some functions
Analog Voltage Accuracy	<p>> Accuracy specifications do not include sensor or measurement noise</p> <p>> $\pm(0.04\%$ of measurement + offset) at 0° to 40°C</p> <p>> $\pm(0.06\%$ of measurement + offset) at -40° to +70°C</p> <p>> $\pm(0.08\%$ of measurement + offset) at -55° to +85°C</p> <p>(extended temperature range)</p>



CAMPBELL SCIENTIFIC CR1000X6 Data Logger including Campbell PC200W software.

Input Limits	± 5 V
ADC	24-bit
Power Requirements	10 to 18 Vdc
Real-Time Clock Accuracy	± 3 min. per year (Optional GPS correction to 10 us)
Internet Protocols	Ethernet, PPP, CS I/O IP.RNDIS, ICMP/Ping. Auto-IP9APIPA), IPv4, IPv6, UDP, TCP, TLS, DNS, DHCP, SLAAC, SNMPv3, NTP, Telnet, HTTP(S), FTP(S), SMTP/TLS, POP3/TLS
Communications Protocols	PakBus, Modbus, DNP3, SDI-12, TCP, UDP, and others
Warranty	3 years (against defects in materials and workmanship)
Battery-backed SRAM for CPU Usage & Final Storage	4 MB
Data Storage	4 MB SRAM + 72 MB flash Storage expansion of up to 8 GB with removable microSD flash memory card
Idle Current Drain, Average	, < 1 mA (@ 12 Vdc)
Active Current Drain, Average	> 1 mA (1 Hz scan @ 12 Vdc) > 55 mA (20 Hz scan @ 12 Vdc)
Dimensions	23.8 c 10.1 x 6.2 cm (9.36 x 3.98 x 2.42 in) Additional clearance required for cables and leads
Weight	0.86 kg (1.9 lb)



RM YOUNG -05103-L

SPECIFICATIONS

Operating Temperature Range	-50° to +50°C (assuming non-riming conditions)
Mounting Pipe Description	>34 mm (1.34 in) OD > Standard 1.0-in IPS schedule 40
Housing Diameter	5 cm (2.0 in.)
Propellar Diameter	18 cm (7.1 in)
Height	37 cm (14.6 in.)
Length	55 cm (21.7 in.)
Weight	1.5 kg (3.2 lb())

WIND SPEED

Range	0 to 100 m/s (0 to 224 mph)
Accuracy	±0.3 m/s (±0.6 mph) or 1% reading
Starting Threshold	1.0 m/s (2.2 mph)
Distance Constant	2.7 m (8.9 ft) 63% recovery
Output	AC voltage (three pulses per revolution)
Resolution	(0.0980 m s ⁻¹) / (scan rate in seconds) or (0.2192 mph) / (scan rate in seconds)

WIND SPEED AND DIRECTION



CROSSARM

ABOUT CROSSARM AND CROSSARM BRACKET

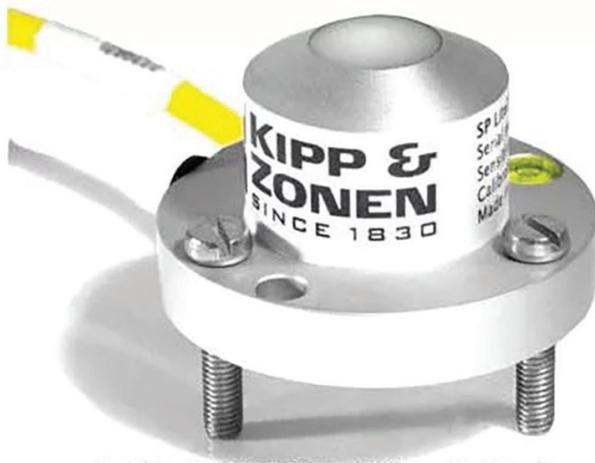
The crossarm provides a rugged attachment point for securing the 05103-L to our tripods and towers. The design of the crossarm places the sensor at a distance away from the midline of the tower or tripod thereby serving to reduce the effects of the mount on the sensor measurement

WIND DIRECTION

Mechanical Range	0 to 360°
Electrical Range	355° (5° open)
Accuracy	±3°
Starting Threshold	1.1 m/s (2.4 mph) at 10° displacement
Distance Constant	1.3 m (4.3 ft) 50% recovery
Damping Ration	0.3
Dampened Natural Wavelength	7.4 m (24.3 ft)
Undampened Natural Wavelength	7.4 m (23.6 ft)
Output	> Analog DC voltage from potentiometer (resistance 10 kohm) > Linearity is 0.25% > Life expectancy is 50 million revolutions
Voltage	Power Switched excitation voltage supplied by datalogger

SOLAR RADIATION:

KIPPS AND ZONEN SP LITE 2 WITH MOUNTING BRACKET



SP LITE 2



Mounting Bracket Kit

SPECIFICATIONS

- Spectral range: 400 to 1100 nm
- Sensitivity 60 to 100 (option, 10 ± 0.5) $\mu\text{V}/\text{W}/\text{m}^2$
- Response time SP LITE2 (95%) < 500 ns
- Directional error (up to 80° with $1000 \text{ W}/\text{m}^2$ beam): < $5 \text{ W}/\text{m}^2$
- Temperature dependence: $-0.15 \text{ \%}/^\circ\text{C}$
- Operating temperature range: -40°C to $+80^\circ\text{C}$
- Maximum solar irradiance: $2000 \text{ W}/\text{m}^2$
- Field of view: 180°
- Cable Length: 48m standard (user specified optional)
- Warranty 2 years



TEMPERATURE & RELATIVE HUMIDITY



VIASALA HMP60L

SPECIFICATIONS

Supply Voltage	5 to 28 Vdc (typically powered by datalogger's 12 V Supply)
Current Consumption	> 1 mA (typical) > 5 mA (maximum)
Filter Description	0.2 µm Teflon membrane
Setting Time	1 s
House Classification	IP65
Housing Material	AISI 316 stainless steel
Filter Cap Material	Chrome-coated ABS plastic
Sensor Diameter	1.2 cm (0.5 in.)
Filter Diameter	1.2 cm (0.5 in.)
Length	7.1 cm (2.8 in)
Weight	0.05 kg (0.1 lb) with 1.83 (6ft) cable
Sensor	Vaisala's INTERCAP capacitive chip
Measurement Range	0 to 100% RH (non-condensing)
Typical Accuracy at -40° to 0°C	> ±5% (0 to 90% RH) > ±7% (90 to 100% RH)
Typical Accuracy at 0° to 40°C	> ±3% (0 to 90% RH) > ±5% (90 to 100% RH)
Typical Accuracy at 40° to 60°C	> ±5% (0 to 90% RH) > ±7% (90 to 100% RH)

Air Temperature

Sensor	1000 ohm Platinum Resistance Thermometer (PRT)
Measurement Range	-40° to +60°C
Accuracy	±0.6°C

RAD06 RADIATION SHIELD

Included with HMP60L



The RAD06 includes a 2 in. U-bolt with a plastic V-block. The U-bolt is placed in the holes on the side of the bracket for attachment to a mast or vertical pole. The U-bolt is placed in the holes on the bottom of the bracket for attachment to a cross-arm.

BAROMETRIC PRESSURE

SETRA 278



SPECIFICATIONS

- NOTE -	1 HPA = 1 MBAR
Pressure Range	600 to 1100 hPa
Long-Term Stability	±0.1 hPa per year
Response Time	< 100 ms
Resolution	±0.01 hPa
Excitation	9.5 to 28 Vdc
Linearity	±0.4hPa
Hysteresis	±0.05 hPa
Repeatability	±0.03 hPa

Accuracy

> Accuracy refers to the root sum squared (RSS) of end point non-linearity, hysteresis, repeatability, and calibration uncertainty
 > ±0.5 hPa (@+20°C)
 > ±1.0 hPa (@ 0° to 40°C)
 > ±1.5 hPa (@ -20° to +50°C)
 > ±2.0 hPa (@ -40° to +60°C)

Warm up Time

< 1 s

External Trigger Voltage

> 0 Vdc (sleep mode)
 > 3 to 28 Vdc (operating mode)

Current Consumption

> <3 mA (active)
 > <1 µA (sleep mode)

Operating Temperature Range

-40° to +60°C

Cable Diameter

0.8 cm (0.3 in.)

Dimensions

9.1 x 6.1 x 2.5 cm (3.6 x 2.4 x 1.0 in.)

Weight

135 g (4.8 oz)

PRECIPITATION

HYQUEST 200mm 0.2mm TIPPING BUCKET RAIN GAUGE with LEVELLING BASE



TB4 RAIN GAUGE



EM-240 LEVELLING BASE

SPECIFICATIONS

Sensor Type	Tipping bucket with siphon
Accuracy	> $\pm 2\%$ @ ,250 mm/h (9.8 in./h) > 3% @ 250 to 500 mm/h (9.8 to 19.7 in./h)
Resolution	0.254 mm (0.01 in.)
Measurement Range	0 to 700 mm/h (0 to 27.6 in./h)
Operating Temperature Range	0° to 70°C
Humidity Range	0 to 100%
Cable Type	Two-conductor shielded
Drain Tube Size	Both Filters accept 12 mm (0.47 in.) ID tubing
Office Diameter	20 cm (7.9 in.)
Height	34.2 cm (13.5 in.)
Weight	3.3kg (7.4 lb) with 7.623-m (25ft) cable