METEOROLOGICAL INSTRUMENTS



INSTRUCTIONS

SERIAL INTERFACE MODEL 32400

CE

WARRANTY AND ASSISTANCE

This equipment is warranted by CAMPBELL SCIENTIFIC (CANADA) CORP. ("CSC") to be free from defects in materials and workmanship under normal use and service for **twelve (12) months** from date of shipment unless specified otherwise. ******* Batteries are not warranted. ******* CSC's obligation under this warranty is limited to repairing or replacing (at CSC's option) defective products. The customer shall assume all costs of removing, reinstalling, and shipping defective products to CSC. CSC will return such products by surface carrier prepaid. This warranty shall not apply to any CSC products which have been subjected to modification, misuse, neglect, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose. CSC is not liable for special, indirect, incidental, or consequential damages.

Products may not be returned without prior authorization. To obtain a Return Merchandise Authorization (RMA), contact CAMPBELL SCIENTIFIC (CANADA) CORP., at (780) 454-2505. An RMA number will be issued in order to facilitate Repair Personnel in identifying an instrument upon arrival. Please write this number clearly on the outside of the shipping container. Include description of symptoms and all pertinent details.

CAMPBELL SCIENTIFIC (CANADA) CORP. does not accept collect calls.

Non-warranty products returned for repair should be accompanied by a purchase order to cover repair costs.



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MODEL 32400 SERIAL INTERFACE

SPECIFICATIONS*

Wind	Speed Input:		
vvina	Sensor Type: Sensitivity: Range:	AC Frequency 50mV p-p at 10 0-2000 Hz	Generator)Hz
Wind Direction Input: Sensor Type: Range: Excitation:		Potentiometer 0-5000mV = 0 to 355 degrees 5000mV (limited to 5 mA)	
Volta	ge Inputs (Auxiliary s	Sensor Inputs)	:
, on a	Resolution:	12-bit	
	VIN1 and VIN2	0-1000mV	
	VIN3 and VIN4	0-5000mV	
Voltar	e Outouts:		
vonag	OUT1	0-5000mV	0-100 m/s wind speed
	OUT2	0-5000mV	0-360° wind direction
Serial Output:		Full duplex RS-232, Half duplex RS-485 (2 mS turnaround) 1200, 4800, 9600, 19.2K, & 38.4K baud 8 data, 1 stop, no parity	
Operating Temp:		-50°C to 50°C	
Power:		11 to 30 VDC, 40 mA	
Mounting:		1 inch IPS (1.34 inch actual diameter)	
Size:		4.75" (12cm) H 0.87" (7.3cm) W 2.12" (5.3cm) D	

*Specifications subject to change

1.0 INTRODUCTION

The Model 32400 SERIAL INTERFACE measures wind speed and direction signals from YOUNG sensors and signals from four general purpose voltage inputs. The voltage inputs may be used with YOUNG temperature, humidity, and barometric pressure sensors. One of the voltage inputs may also be used with a tipping bucket precipitation gauge.

Measurements are available in several serial data formats in either full duplex RS-232 or half-duplex RS-485 signals. Both continuous and polled serial outputs are available. When polled, up to 16 units can be networked together. For marine applications the 32400 produces standard NMEA serial output sentences. Calibrated voltage outputs for wind speed and direction are also provided when the 32400 is connected to a YOUNG wind sensor.

2.0 INSTALLATION

The 32400 is supplied in a weather-resistant enclosure with a mounting adapter that fits 1 inch IPS pipe (1.34 inch nominal diameter). When used with the YOUNG Wind Monitor, the mounting adapter engages the Wind Monitor orientation notch. Refer to the WIRING DIAGRAM for electrical connection details and jumper settings.

3.0 OPERATION

Operation begins automatically when power is applied. Jumpers configure the 32400 for common output formats.

3.1 SIGNAL INPUTS

The 32400 has two special inputs for wind speed and direction from YOUNG sensors and four voltage input channels for connection to other meteorological instruments like temperature, humidity, and barometric pressure sensors. For best performance, sensors should be installed within 3m (10ft.) of the 32400.

Measurements from the voltage input channels are converted to numerical values (0-4000) and sent in the serial ASCII output string:

VIN1 and VIN2 full scale input is 1000mV DC, therefore: Input millivolts = Serial output value / 4 VIN3 and VIN4 full scale input is 5000mV, therefore: Input millivolts = Serial output value x 1.25

If PRECIP or PRECIP POLLED serial output formats are active, VIN4 is used to count tipping bucket precipitation sensor tips.

Please refer to SERIAL FORMAT DIAGRAM and WIRING DIAGRAM in the Appendix for additional details.

3.2 JUMPERS

W1 JUMPERS A, B, and C, determine serial output format. Jumper configurations and associated output format are listed below: 1 signifies that jumper is installed, 0 signifies that jumper is omitted. See the SE-RIAL FORMAT DIAGRAM in the Appendix for more details.

ABC	SERIAL OUTPUT FORMAT
000	ASCII Ouput
001	Polled ASCII
010	NMEA1
011	NMEA2
100	RMYT
101	PRECIP
110	PRECIPT POLLED
111	SOFTWARE Mode

ASCII and RMYT formats force the serial baud rate to 9600. NMEA formats force the baud rate to 4800.

ASCII and POLLED ASCII are general purpose outputs that may be used with the YOUNG 26800 or devices that can communicate serially. NMEA outputs are generally for marine applications. RMYT is a proprietary format for use with the YOUNG Wind Tracker.

PRECIP and PRECIP POLLED configure VIN4 as a special input to count tipping bucket precipitation gauge switch closures. (Requires a 10K ohm resistor from VIN4 to EXC terminal.)

SOFTWARE mode allows output format and other parameters to be set using serial commands. Please see section 4.0 SERIAL COMMUNICA-TION and the SERIAL FORMAT DIAGRAM for more information.

W2 & W3 JUMPERS determine output connection type. Only one connection type may be used at a time. Please refer to the WIRING DIAGRAM in the Appendix for jumper location and connection details.

JUMPERS	OUTPUT TYPE
VOUT	Calibrated output for wind speed and direction
	OUT1 0-5000mV = 0-100 m/s Wind Speed
	OUT2 0-5000mV = 0-360 degrees Wind Direction
232	RS-232 full duplex serial
485	RS-485 half duplex serial

4.0 SERIAL COMMUNICATION

The 32400 uses either full-duplex RS-232 or half-duplex RS-485 signals for serial communication. RS-232 is the most simple and operates up distances of 30m (100ft). The RS-485 option is prefered in electrically noisy environments, in applications where multiple units must be networked, or in NMEA marine applications where RS-485 signals are required.

The full duplex RS-232 connection may transmit and receive serial data at the same time.

The RS-485 connection is half-duplex meaning the unit cannot transmit and receive at the same time. The 32400 internally manages the switch between modes.

Many applications require the 32400 to transmit only. However, RS-485 applications that require polling the 32400 or sending commands to it require that the externally connected serial devices must be capable of managing its own half-duplex switching from transmit to receive.

At low baud rates with proper cable installation and connections, transmission distances up to 7km (4mi) are possible using RS-485.

Baud rates of 1200, 4800, 9600, 19.2K, and 38.4K baud are available. Most jumper-selected output formats force the baud rate to a predetermined value. All serial signals use 1 start, 8 data, and 1 stop bit. Any externally connected serial device must be set to the same baud rate as the 32400.

4.1 POLLING

When the serial output format is ASCII POLLED or PRECIP POLLED, the 32400 sends data only when it receives a serial polling command:

Ma!

where 'a' is the unique address of the unit. The default address is 'A' but any alphanumeric character may be used (see POLLING CHARACTER in section 4.2 SERIAL COMMANDS).

See the SERIAL FORMAT DIAGRAM for details on ASCII POLLED data format.

4.2 SERIAL COMMANDS

Serial commands configure operating parameters and perform calibrations.

While most W1 JUMPER settings configure the 32400 to use predetermined parameters, the SOFTWARE mode allows operational parameters to be uniquely configured by serial commands. The parameters are retained even when power is removed.

Commands may be sent using a PC and simple communications programs such as HyperTerm or any other properly configured serial device. All commands that begin with CMD must end with a carriage return (ASCII 13).

Commands may be sent at any time but it may be more convenient to pause 32400 serial output. This is especially necessary W

with half-duple>	RS-485 communication.
Command CMD100 CMD110 CMD210 n	Description OPERATE PAUSE FORMAT 0 ASCII 1 ASCII POLLED 2 NMEA (KNOTS, DIR) 3 NMEA (KNOTS, DIR, TEMP, RH, BARO 4 RMYT 5 PRECIP 6 PRECIP POLLED 9 DIAGNOSTIC
CMD220 n CMD230 c CMD240 nn CMD900	OUTPUT RATE (0=15Hz, 1=0.1Hz, 2=2Hz) POLL CHARACTER (0-9, A-Z) BAUD RATE 12=1200, 48=4800, 96=9600, 192=19200, 384=38400 REPORT PARAMETER SETTINGS
X 3xESC FORMAT detern	Alternative command to enter OPERATE mode Alternative command to PAUSE mines serial output format.

OUTPUT RATE determines the rate at which serial data strings are sent from the 32400.

POLL CHARACTER sets the unique polling address for the 32400. Any single alphanumeric character may be used.

BAUD RATE selects one of several preset baud rates. If you change baud rate while connected, your external device must also be changed in order to continue communicating with the 32400

REPORT PARAMETER SETTINGS shows the current state of Output Format, Output Rate, and Poll Character.

5.0 MAINTENANCE

The 32400 requires no maintenance in normal use. Periodic inspection is recommended to verify correct operation.

6.0 WARRANTY

This product is warranted to be free of defects in materials and construction for a period of 12 months from date of initial purchase. Liability is limited to repair or replacement of defective item. A copy of the warranty policy may be obtained from R. M. Young Company.

7.0 CE COMPLIANCE

This product complies with European CE requirements for the EMC Directive. Please note that shielded cable must be used.

Declaration of Conformity

R. M. Young Company 2801 Aero Park Drive Traverse City, MI 49686 USA

Model 32400 SERIAL INTERFACE The undersigned hereby declares on behalf of R. M. Young Company that the above-referenced product, to which this declaration relates, is in conformity with the provisions of:

Council Directive 2004/108/EC (December 15, 2004) on Electromagnetic Compatibility

Dauid Point R&D Manager

JT FORMATS RMYT serial output for YOUNG Wind Tracker Six bytes in binary format. AB CD SS SS DD DD Wind speed (raw count, two-byte integer) Wind direction x 10 (two-byte integer)	PRECIP POLLED Id dddd <cr lf=""> NMEA 1 sentence sends wind speed in KNOTS and wind direction in degrees. Model 32500 and wind direction as TRUE due to compass correction. Model 32400 designates direction as RELATIVE. %WIMWV, ddd, a, sss.s, N, A *hh NMEA wind measurement header Wind direction (0-360 degrees) Wind direction reference (T=True, R=Relative) Wind speed (KNOTS) Wind speed units (N=KNOTS) Wind speed units (N=KNOTS) Wind speed units (N=KNOTS) Checksum field Checksum fiel</cr>	MEA 2 serial output alternates between the NMEA 1 wind sentence and the following tansducer sentence which includes measurements for temperature, relative humidity, and barometric pressure. SWXDRAC nono. P. MAR transducer there of temperature, relative humidity, and barometric pressure. SWXDRAC nono. P. MAR transducer type (C = temperature) (C = Cosisus) Transducer type (C = temperature) (C = temperature) (C = temperature) (C = Cosisus) (C = temperature) (C = temperature) (C = temperature) (C = temperature) (C = temper
SERIAL OUTPI	Scii, POLLED AScii, PRECIP, or ssss dddd www www ddd sss dddd www www ddd	The adjacent chart shows multipliers to convert raw pulse count values to standard wind speed units. * Model 03002 is a cup-wheel type sensor therefore wind speed calculation must use multiplier (M) and offsett (O).
32500	A A List only) a A A Count) a A A Count) a A A A Count) a A A A A A A A A A A A A A A A A A A	KM/HR M=1.3505 0-0.7 0.1765 0.1765 0.1765 0.1765
400 /	polled forms d speed (rav ff compass V input = 0 t V input = 0 t V input = 0 t IP COUNT (nent x 10 (d, rrected by c	KNOTS KNOTS M=0.7285 0=0.4 0.09526 0.09526 0.09526 0.099566
32	s character (Win,). Corrected (0 to 1000m (0 to 5000m ig Bucket Tl jrees) Uhco jrees) Uhco	MPH M=0.8390 0=0.4 0.1097 0.1097 0.1146 0.1146 0.1146 5.4 MPH
	Poll address 10 (degrees bitage input (bitage input (bitage input (or Tippit or X10 (deg	M/S M=0.3752 0=0.2 0.04903 0.04903 0.04903 0.04903 0.04903 0.04903 0.04903 0.04903 0.04903 0.05123 0.05123
	Wind direction x VIN1 vc VIN2 vc VIN3 vc VIN3 vc VIN4 vc VIN4 vc VIN4 vc VIN4 vc VIN4 vc VIN4 vc VIN4 vc	WIND SENSOR 03002 * 04101 04106 05103 05106 05305 05305 05305 Sensor = 05103 Win Raw pulse count in s MPH Multiplier = 0.1



32400-90





