

APPENDIX A – TECHNICAL DATA

SPECIFICATIONS

Physical

Size (without mounting brackets)
Length: 10.4"
Height: 7.6"
Depth: 3.4"
Weight
3.0lb.

Environmental

Storage
Temperature: -50 °C to 85 °C
Humidity: 0 to 95%, non-condensing
Operating
Temperature: -40 °C to 72 °C
Humidity: 0 to 95%, non-condensing

Mounting

Shelf or backboard (includes mounting brackets)

Construction

Chassis
Fully enclosed, anodized aluminum
Externally accessible keypad, LEDs and connectors
Electrical
All components mounted on conformal coated, internal PCBs

Power

Voltage
Range: 9 to 36 Vdc
Consumption
Typical: 2.3 W
Maximum: 3.8 W (with GPS Receiver, Ethernet and Modem options)

Isolation

Power
Minimum: 3800 Vdc from B and N terminals to chassis and inputs
Digital Inputs
Minimum: 3800 Vdc to any terminal
Analog Inputs
Minimum: 3800 Vdc to any terminal
Input to Adjacent Input
Digital: minimum 3800 Vdc
Analog: minimum 3200 Vdc
USB Host and Device Ports
Minimum: 3800 Vdc to any terminal
GPS Receiver and Ethernet Port (optional)
Minimum: 3800 Vdc to any terminal
Internal Modem (optional)
Designed to meet FCC part 68 standards

Capacities

Inputs
Digital: 32 for CWR-40A, 64 for CWR-72A, all optically isolated
Analog: 8, voltage or current (optional)
Virtual: 32, user-assigned
Timer: 32, user-assigned
Train Speed Monitor: 4, user-assigned
Outputs
Relay: 2, form C, rated for 2 A at 24 Vdc or 1 A at 125 Vac, maximum switching capacity of 125 VA or 60 W, service life 1 million electrical (typical)

Event Storage

Standard: 234,777 records
Maximum: 2,947,289 records

Liquid Crystal Display

Characters: 80 total on 4 lines
Viewing Area: 2.8" by .8"

Front Panel Keypad

Quantity: 20 keys

Physical Inputs

Input Impedance
Digital: minimum 10 KOhms, optically isolated
Analog: minimum 10 MOhms
Range
Digital Input - On: 9 to 36 Vdc
Digital Input - Off: 0 to 1 Vdc
Analog DC Voltage: 3 scales, ± 25.5 Vdc, +51.1 Vdc, ± 255 Vdc
Analog AC Voltage: 2 scales, 25.5 Vdc, 255 Vac
Analog Current: 2 scales, ± 25.5 Adc, 25.5 Aac

Event Validation Times

Digital: .01 to 327.67 seconds, compatible with fixed rate flashing circuits
Analog: fast and slow filter settings

Analog Limit Values

Voltage
High and Low Limits: in multiples of .1 V or 1 V
Current
High and Low Limits: in multiples of .1 A

Analog Input Accuracy

Typical Voltage: ± 1.5 V or ± 1.5 V
Typical Current: ± 2 A

Virtual Inputs

Definitions
Any logical association shared by 1 to 4 variables (i.e., Digital, Analog, Timer or other Virtual Inputs)
Assigned by defining the state of the Virtual Input for each combination of variable states

Virtual Inputs (continued)

Reporting

Creates standard Event Records
Relay can be controlled by each Virtual Input
Modem (optional) can be enabled to dial out Event Records

Timer Inputs

Programming

Any input can be assigned as a trigger or terminating source
On or Off events can be assigned as a trigger or terminating source

Limit Values

High and Low Limits: in multiples of .1 seconds
Range: 0.0 to 999.9 seconds

Reporting

Measured Time is reported in each Timer Input Event Record
Violation of Limit Values are also reported

Temperature Sensing

Usage: measures and reports internal temperature of recorder
High and Low Limits: -67 °F to 257 °F

Train Speed Monitor

Operation

Reports excessive train speed
Logs standard Event Record

Sensors

Digital Inputs: 2 required
Distance: 50' to 5280'

Limit Values

5 to 180 mph

Memory

Type

Non-volatile, Event Records and Setup Database are stored in flash memory chip
Newest data over-writes oldest data, 129th day over-writes first day

Storage Longevity

Infinite with power off
Rated for 100,000 write operations

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Ports

RS-232

Quantity: 1, for use with a PC

Terminal Emulation: ANSI

Baud Rates: 300, 600, 1200, 2400, 4800, 9600, 19,200, 38,400, 57,600, 115,200

Bit Format: 8-N-1

USB Host

Compatible with any FAT-32 formatted flash drive

Can create a text file of Event Record data from any time span

Can be used to update firmware

USB Device

Eliminates need for serial comm port, data transfer rates of 4.71 Mbps

Ethernet (optional)

Type: 10/100 Base-T

Protocols: TCP/IP, Telnet, SNMP-Multicast

Concurrent Sessions: Telnet (2)

Provides remote or local access via TCP/IP

Data transfer rates of 4.70Mbps

User-assignable IP Address, port, sub-net mask

Modem (optional)

Provides remote access, auto-answer

GPS Receiver (optional)

Used to provide precise, real-time clock control, latitude and longitude coordinates

Connectors

Power

Detachable, tension clamp, 4-position, 12 to 22 AWG

Dual B and N terminals

Digital Inputs

Detachable, tension clamp, 8-position, 12 to 22 AWG

Analog Inputs

Detachable, tension clamp, 8-position, 12 to 22 AWG

Relays (2)

Detachable, tension clamp, 3-position, 12 to 22 AWG

Normally open, normally closed and common terminals per relay

Terminal Port

DE-9 male, configured as modified DCE

USB Host Port

USB Type A female

USB Device Port

USB Type B female

Telephone Line

RJ-11 female

Ethernet Port (optional)

RJ-45 female

GPS Receiver (optional)

MCX female

Indicators

LCD Panel

Includes LED back lighting for enhanced visibility

Displays numerous command menus for configuring the recorder and retrieving data

Front Panel LEDs (3)

Power: green

Terminal: green, flashes with send and receive data

Modem: green, flashes with send and receive data and ringing

Ethernet Port LEDs (2 optional)

Green: link established

Yellow: data activity

Controls

Keypad

Located on front panel, below LCD

Keys: 0-9, Browse, Alpha, Setup, Esc, Enter, Save/., left, right, up, down/-

LCD Contrast Adjust

Single-turn pot., accessible from front panel

Internal Clock

Accuracy

Typical: ±8 seconds per month (3ppm) when not synchronized

Volatility: maintains accuracy for minimum of 30 days with loss of power

Resolution: .01 seconds for all Event Records

Sync Interval

SNTP-Multicast: per time server schedule (requires Ethernet Port option)

GPS: once per hour (requires GPS Receiver option)

Operation

Time Zones: selectable from 7 different North American settings

Daylight Saving Time: enable or disable automatic adjustment

Leap Year: automatically adjusted

GPS Receiver (optional)

Includes PCB and external antenna

PCB

Plugs into mating connector inside recorder

Antenna

Size: diameter 1.8", height .6" (not including mounting screw)

Weight: 2 oz. (less cable)

Operating Temperature: -40 °C to 85 °C

Mounting: bulkhead mountable to any surface less than 3/8" thick

Location: unobstructed skyward orientation, for use outdoors

Password Protection

Administrative Level

Access: unrestricted to all functions

Length: 8 characters

Restricted Level

Access: unrestricted Event Record and Setup Database viewing, limited modifications to Setup Database functions

Length: 8 characters

Passcode

Access: limited modifications to Setup Database functions, via front panel

Length: 8 digits

Internal Modem (optional)

Type

V.34, 33,600Baud, data compression and error correction

Usage

Remote access via auto-answer operation

Allows dial-out alarm reporting of Virtual Input records

Compliance

Designed to meet FCC part 68 standards

Dial-out Alarms (optional)

Calling Method

Primary and secondary dial numbers, multiple attempts

Tone or pulse dialing

Data

Issues Virtual Input Event Records if enabled by Virtual Input definition

MICRO-AIDE reserves the right to make changes, at its sole discretion, to any specification listed herein.

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TRANSFER RATES

Table 14 on page 87 lists typical bit transfer rates for each of the CWR-72A's user-accessible ports. In each case the same 20,000 Event Records with no-detail formatting were either dumped to a PC file or saved directly to a flash drive. The times listed are normalized relative to 1,000 Event Records. If speed is a concern, using the USB Device Port is highly recommended.

Port	Time to transfer 1,000 Event Records (sec)	Actual transfer rate (bps)	Relative speed compared to 38,400
Terminal Port (38,400)	19.0	38,396	Used as reference
Internal modem	19.4	37,649	1.0 times faster
Terminal Port (115,200)	6.4	114,845	3.0 times faster
USB Host	.8	n/a	22.4 times faster
Ethernet Port	.2	4,704,075	122.5 times faster
USB Device Port	.2	4,714,063	122.8 times faster

Table 14: Bit Transfer Rates by Port

TERMINAL PORT CABLE

The following cable is included with every CWR-72A.

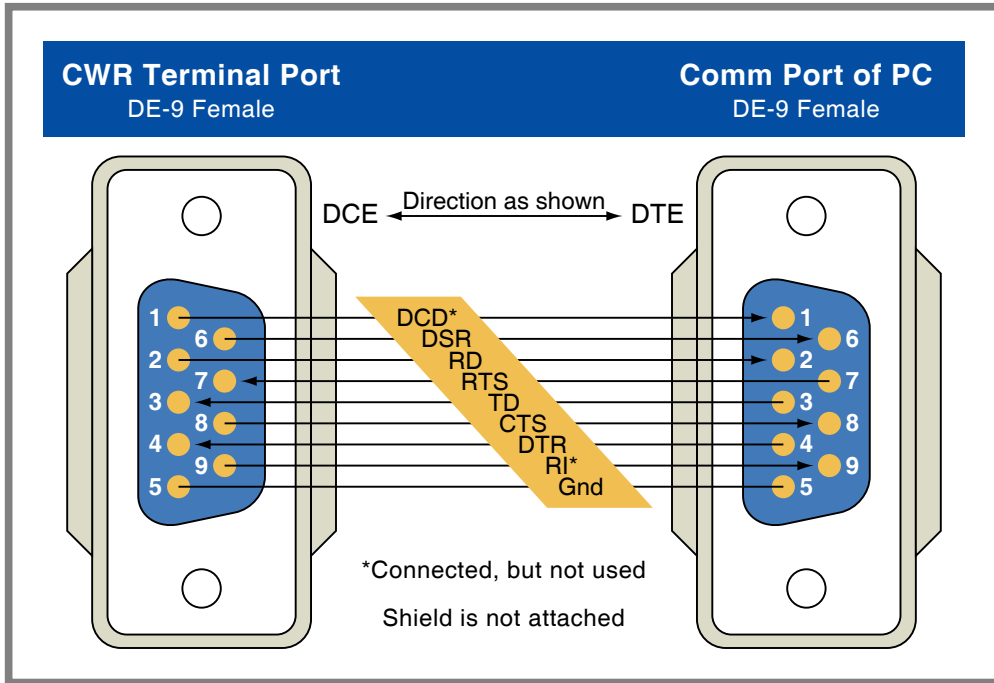


Figure 8: Terminal Port Cable - Wiring Diagram

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