CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

MD485
RS-485 Multidrop Interface

Increases Communication Options
Adds data link possibilities among dataloggers, PCs, and sensors

Overview

The MD485 is an intelligent RS-485 interface that permits a PC to address and communicate with one or more dataloggers over a distance of up to 1200 m. It also supports datalogger-to-datalogger communication, callback from a remote datalogger, PC-to-printer communications, and digital camera-to-datalogger connections.

Benefits and Features

❭ Compatible with most Campbell Scientific dataloggers

❭ Can be used with a phone modem or spread spectrum radio to extend the distance between the datalogger and PC

❭ Increases the distance allowed between a CC5MPX digital camera and a PakBus datalogger

❭ Communicates at rates up to 115.2 kbps

❭ Extends the distance between AVW200 Vibrating Wire Interfaces for situations where wireless communication is impractical

❭ Internal buffering ensures that data is not lost during transmission and allows each side to operate at different baud rates

❭ Includes gas tubes on the RS-485 ports and a ground lug for better surge protection

Technical Description

The MD485 includes three ports (RS-232, CS I/O, RS-485) for connecting a PC, a datalogger, or another MD485. Any two ports can be used at a time. The MD485 can be configured to provide transparent communications, MD9 emulation, and PakBus® networking. Although the MD485 can emulate an MD9, the MD485 can not be added to an existing MD9 network. PakBus networking requires the dataloggers to use the PakBus communications protocol. PC400 or LoggerNet software is used to initiate and control the communications link.

Powering the MD485

AC power is typically used at the computer site; a #15966 wall charger is required. At the field site, the MD485 is powered by the datalogger through its CS I/O port. If the MD485 is connected to the datalogger's RS-232 port instead of the CS I/O port, or if the datalogger was purchased before December 1997, a #14291 Field Power Cable is required. Phone-to-MD485 and spread spectrum radio-to-MD485 networks also require a power supply with a null modem port . An A100 adapter used with a PS150 or PS200 power supply provides this capability. The PS150 or PS200 is recharged via a wall charger or a solar panel.

Point-to-Point and Point-to-Multipoint Equipment

Point-to-point and point-to-multipoint networks use the following:

1. PC running PC400 or LoggerNet software
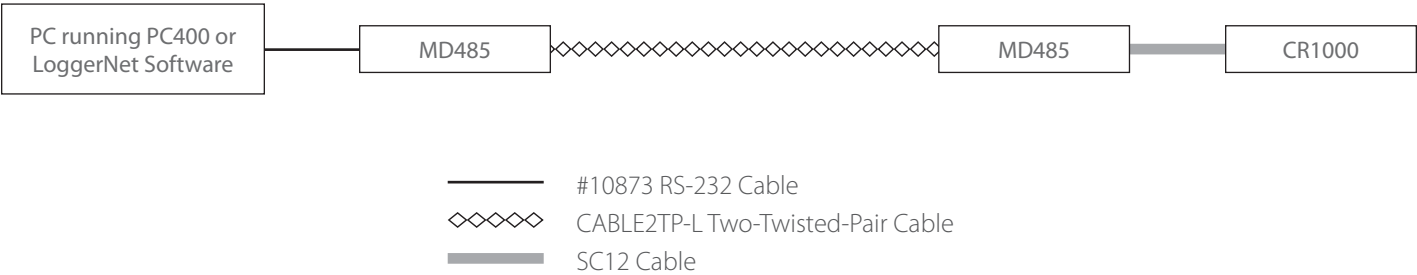2. At the computer site, an MD485 is connected to the computer via a #10873 cable.
3. At each datalogger site, an MD485 is connected either to the datalogger's CS I/O port (not compatible with the CR200(X)-series) or the datalogger's RS-232 port. The SC12 serial cable connects an MD485 modem to the CS I/O port. The #18663 9-pin male to 9-pin male null modem cable connects the MD485 to the RS-232 port.

4. The CABLE2TP-L Two-Twisted-Pair 22-AWG Cable connects an MD485 to another MD485. Please note that when communicating at maximum distances and high data rates, a cable with polyethylene insulation is recommended.
5. Campbell Scientific datalogger.
6. Power supply (see above)
7. Environmental enclosure. At each field site, the datalogger, power supply, and MD485 should be housed in the enclosure if the equipment is not located in a building.

Point-to-Point Network Example

| PC running PC400 or LoggerNet Software |—| MD485 |◇◇◇◇◇◇| MD485 |▬▬| CR1000 |

———	#10873 RS-232 Cable
◇◇◇◇◇	CABLE2TP-L Two-Twisted-Pair Cable
▬▬▬	SC12 Cable

Point-to-Multipoint Network Example

| PC running PC400 or LoggerNet Software |—| MD485 |◇◇◇◇◇◇| MD485 |▬▬| CR1000 |
| | | | | | MD485 |·····| CR200X |

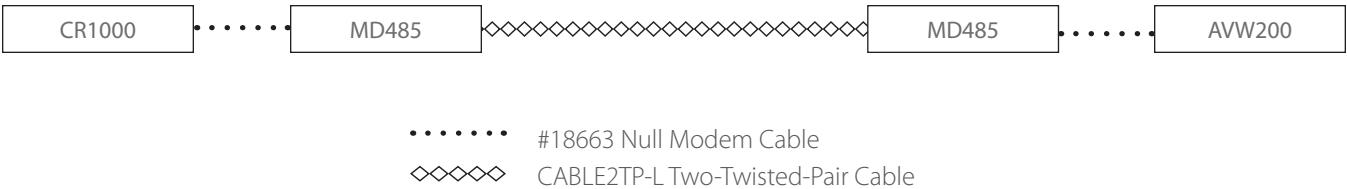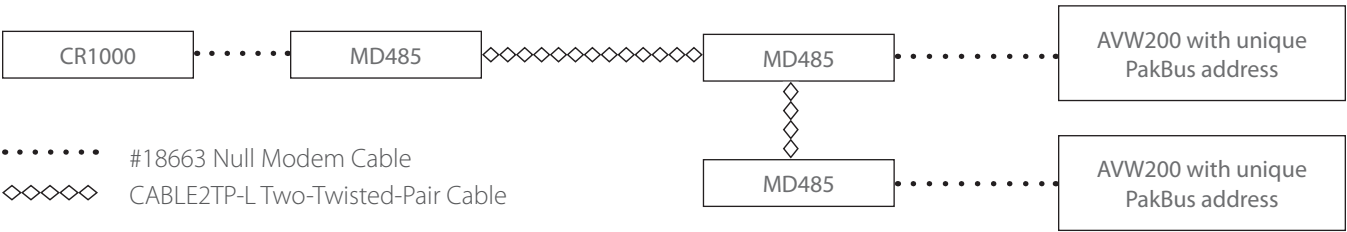|	
———	#10873 RS-232 Cable
◇◇◇◇◇	CABLE2TP-L Two-Twisted-Pair Cable
▬▬▬	SC12 Cable
·······	#18663 Null Modem Cable

Combining with Other Devices

The MD485 can be combined with our AVW2000-series Vibrating Wire Interfaces, CC5MPX Digital Camera, phone modems (including cellular), and spread spectrum radios. The following examples show the equipment used for these systems.

Field site equipment should be housed in an environmental enclosure. Information about configuring the other devices is provided in the user manuals.
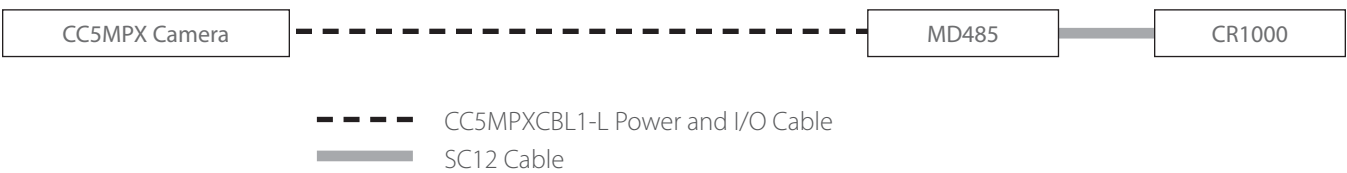
Point-to-Point AVW200-to-MD485 Example

| CR1000 | ······· | MD485 | ◇◇◇◇◇◇◇◇◇◇◇◇ | MD485 | ······· | AVW200 |

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·······    #18663 Null Modem Cable
◇◇◇◇◇◇     CABLE2TP-L Two-Twisted-Pair Cable
```

Point-to-Multipoint AVW200-to-MD485 Example

| CR1000 | ······· | MD485 | ◇◇◇◇◇◇◇◇◇ | MD485 | ······· | AVW200 with unique PakBus address |

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·······    #18663 Null Modem Cable
◇◇◇◇◇◇     CABLE2TP-L Two-Twisted-Pair Cable
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| MD485 | ······· | AVW200 with unique PakBus address |

CC5MPX Camera-to-MD485 Example

| CC5MPX Camera | ─ ─ ─ ─ ─ ─ ─ | MD485 | ▬▬▬ | CR1000 |

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─ ─ ─ ─    CC5MPXCBL1-L Power and I/O Cable
▬▬▬▬       SC12 Cable
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RF401A Spread Spectrum Radio-to-MD485 Example

| PC running LoggerNet Software | ──── | RF401A |

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⚡ ⚡       Wireless Telemetry
──────     #10873 RS-232 Cable
◇◇◇◇◇◇     CABLE2TP-L Two-Twisted-Pair Cable
▬▬▬▬       SC12 Cable
```

| RF401A |
| PS150/A100 |
| MD485 | ◇◇◇◇◇◇ | MD485 |
| CR1000 |
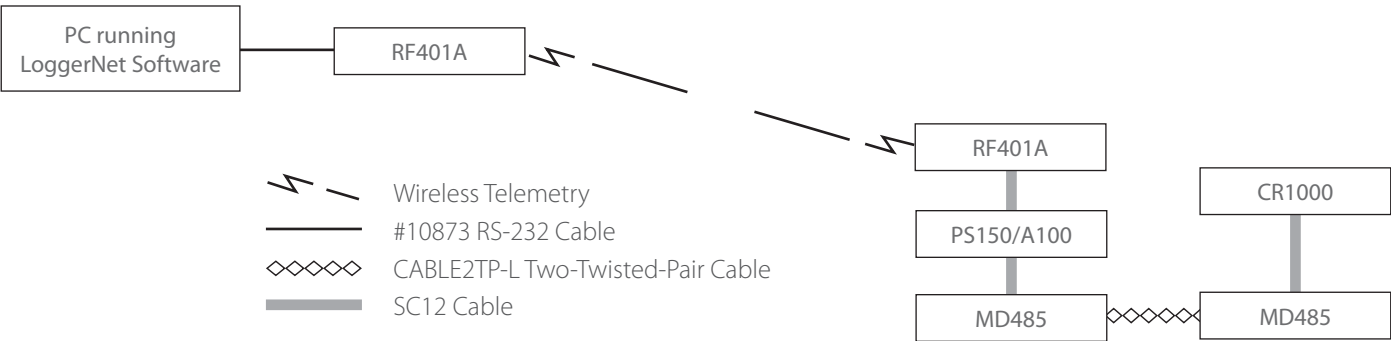
COM220 Phone Modem-to-MD485 Example[1]

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┌─────────────────┐     ┌─────────────────┐
│  PC running     │─────│ Hayes-Compatible│
│ LoggerNet Software    │     Modem        │
└─────────────────┘     └─────────────────┘
```

〜〜〜〜 Phone Lines
◇◇◇◇◇◇ CABLE2TP-L Two-Twisted-Pair Cable
▬▬▬▬▬ SC12 Cable
───── RS-232 Cable

```
                    ┌──────────────┐          ┌──────────────┐
                    │   COM220     │          │   CR1000     │
                    └──────────────┘          └──────────────┘
                    ┌──────────────┐
                    │  PS150/A100  │
                    └──────────────┘
                    ┌──────────────┐          ┌──────────────┐
                    │   MD485      │◇◇◇◇◇◇   │   MD485      │
                    └──────────────┘          └──────────────┘
```
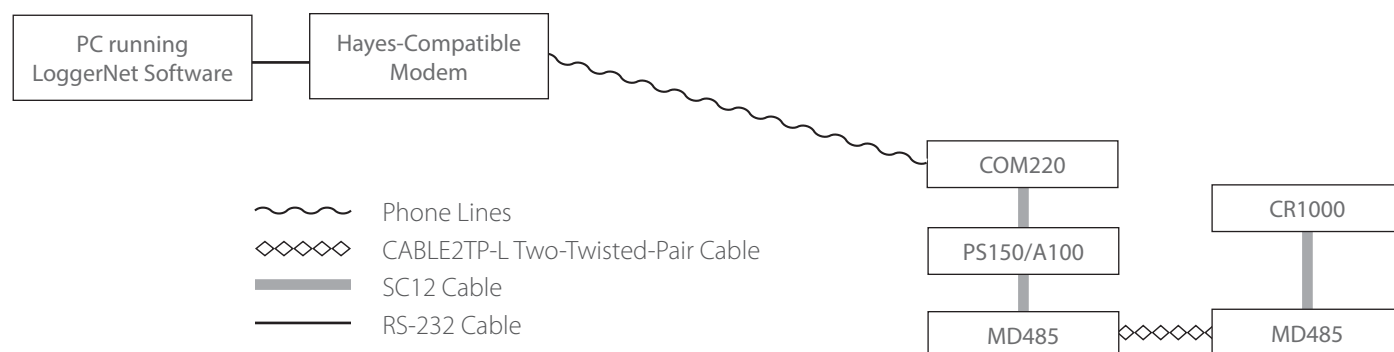
Specifications

❯ Baud Rate: 1200, 9600, 19.2k, 38.4k, 57.6k, 115.2k bps

❯ Voltage: 12 Vdc from datalogger or #15966 wall charger

❯ Surge: Complies with IEC61000-4-5, test level 3 (±2 kV, 2 Ω coupling impedance)

❯ Maximum Cable Length: 1219 m (4000 ft)

❯ Dimensions: 15.88 x 6.35 x 1.91 cm (6.25 x 2.5 x 0.75 in.)

❯ Weight: 127.6 g (4.5 oz)

Current Drain

❯ Standby Mode: 1.2 mA

❯ Communicating: 2 to 7 mA

Power

❯ Standby Mode: 14.4 mW

❯ Communicating: 24 to 84 mW

ESD

❯ Air Discharge: Complies with IEC61000-4-2, test level 4 (±15 kV)

❯ Contact Discharge: Complies with IEC61000-4-2, test level 4 (±8 kV)

Temperature Range

❯ Standard: -25° to +50°C

❯ Extended: [2]-55° to 85°C

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[1]*If your telephone company has not installed a surge protector, Campbell Scientific recommends connecting either a #6362 or #4330 surge protector to the COM220 phone modem.*

[2]*The push button that allows customers to check/edit programmable settings while the MD485 is connected to a computer may not operate at temperatures colder than -25°C.*