

# CDI 5200 - SC

## SERIAL COMMUNICATION OPTION FOR CDI FLOWMETERS

- Many meters can be monitored over a single cable
- Supports Modbus RTU communications over an RS-485 network
- Transmits current reading and cumulative usage
- Available as an option on new meters and as a retrofit for existing meters (CDI 5200-SC)

Serial communications provides an inexpensive, convenient way to gather information from a large number of flow meters. A single cable is run from meter to meter and back to the host computer, PLC or Ethernet adaptor. Over 100 meters can be monitored, and the total length of cable can be as much as 4000 feet. The cabling is done to the RS-485 standard; it can connect directly to most PLCs and it can connect to a host computer through a simple RS-485 to USB adaptor, or to an Ethernet network through an Ethernet to RS-485 adaptor.

Figure 1 shows the wiring of the meters to two adaptors that are available from CDI.

### TWO-WIRE RS-485 OVERVIEW

The CDI 5200-SC option operates on a two-wire (half duplex) RS-485 bus. In this system, a single master (the computer or PLC) is connected to a number of slaves (the flowmeters) through a two-wire data connection with a return. Data are transmitted by creating a difference in voltage between the two data lines; this makes the system highly immune to noise. Data can be transmitted up to 4000 feet at low data rates. The number of slaves that can be supported on the network depends upon the electrical characteristics of the slaves; as many as 128 of the 5200-SC slaves can be supported.

### MODBUS RTU OVERVIEW

Modbus RTU is the communication protocol used by the 5200-SC. It specifies the formatting of data transmitted over the bus, the commands used to communicate with the slave, and the error-checking protocol that is used.

Each slave has an address, and no two slaves on the network can have the same address. When a command is sent to it by the master, the slave that is addressed responds to acknowledge the command and to provide any data that is requested. Each message includes a two-byte cyclical redun-

dancy check that verifies that the message has not been corrupted.

### COMMUNICATION PARAMETERS

data rate:	9600 baud
data bits:	eight
parity:	none (standard) even (on request)
stop bits:	one or two accepted two transmitted

### MODBUS FUNCTION CODES SUPPORTED:

- 04: read input registers
- 06: write single register
- 16: write multiple registers

### DATA VERIFICATION

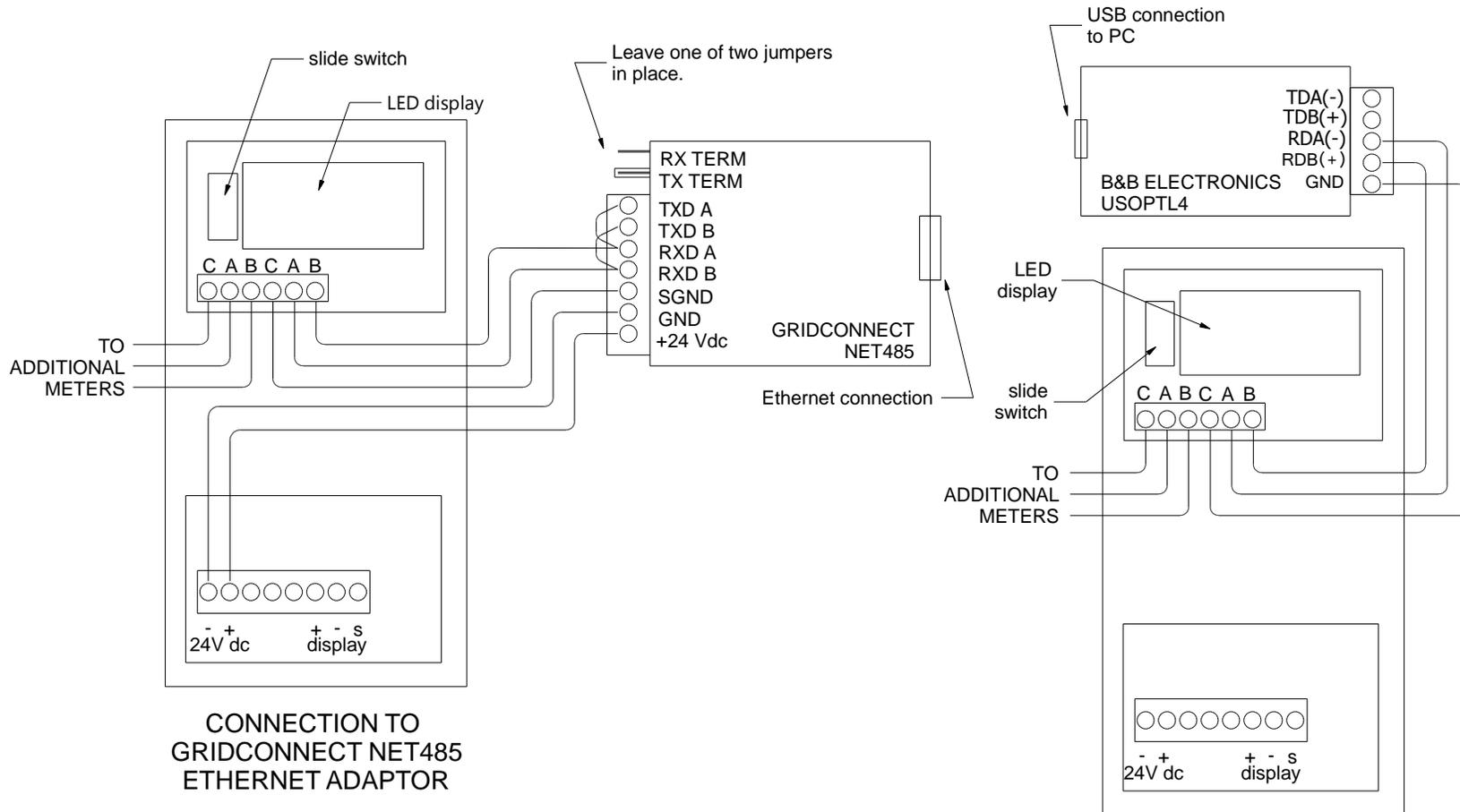
The Modbus cyclical redundancy check (CRC) is performed on incoming and outgoing data.

### REGISTERS USED:

- 00: current flow in units of 0.1 scfm  
0.1 m3h or 0.01 m3m (two bytes)
- 01, 02: cumulative usage in units of ten cubic feet or 1 cubic meter (four bytes)

### DEVICE ADDRESSING

Each 5200-SC display board has a pre-programmed address that is marked on the board. A different address can be programmed, if desired.



**NOTES:**

1. The terminal markings are reversed on the NET485. Wire RXD A to B and RXD B to A.
2. The network should include one display board with biasing. Newer display boards have a slide switch to turn biasing on or off. Older boards with biasing have 'SC/B' in the lower left corner of the label.
3. Install the 120-Ohm resistor that is provided between the "A" and "B" terminals in the last display board in the network.
4. Where electromagnetic interference may be present, shielded cable is recommended. The drain wire may be used as the "C" connection.

**WIRING OF RS-485 NETWORK**