CDI 5200 - SC

SERIAL COMMUNICATON 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 or PLC. 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 converter.

Figure 1 shows the wiring of the meters in an RS-485 bus.

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
parity:	none
data bits:	eight
stop bits:	one or two

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 (two bytes)

01, 02: cumulative usage in units of ten cubic feet (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.

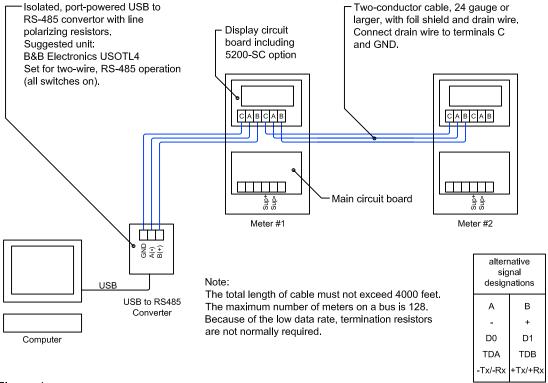# CDI 5200 - SC

SERIAL COMMUNICATON OPTION FOR CDI FLOWMETERS

Isolated, port-powered USB to RS-485 convertor with line polarizing resistors.
Suggested unit:
B&B Electronics USOTL4
Set for two-wire, RS-485 operation (all switches on).

Display circuit board including 5200-SC option

Two-conductor cable, 24 gauge or larger, with foil shield and drain wire. Connect drain wire to terminals C and GND.

C A B C A B

C A B C A B

Main circuit board

Sup+ Sup-

Sup+ Sup-

Meter #1

Meter #2

GND A(-) B(+)

USB

USB to RS485 Converter

Computer

Note:
The total length of cable must not exceed 4000 feet.
The maximum number of meters on a bus is 128.
Because of the low data rate, termination resistors are not normally required.

alternative signal designations	
A	B
-	+
D0	D1
TDA	TDB
-Tx/-Rx	+Tx/+Rx

Figure 1
Basic RS-485 Signal Wiring

omni Instruments
Measurement > Control > Data Acquisition