Preliminary

CDI WIRELESS NETWORKING

WIRELESS NETWORKING OPTION FOR CDI FLOWMETERS

- **Provides wireless monitoring of CDI 5000 Series flowmeters throughout a facility**
- **Available as an option on new meters and as a retrofit for existing meters**
- **MeterGrapher monitoring software provided at no charge**
- **Utilizes ZigBee® mesh-networking protocol to relay data from remote meters**
- **Transmits current reading and cumulative usage**
- **Wireless transmissions have 128-bit encryption**

A radio module mounted within each meter transmits data to an Ethernet-connected gateway. The radio modules operate on the ZigBee mesh-networking protocol, allowing data to be passed from meter to meter, and thereby greatly extending the distance over which the wireless system can operate. The option is available with new 5000-series meters, and it can be retrofitted into existing CDI 5000-series meters, Rev. 3.0 and later.

Used with CDI's MeterGrapher software, the system can monitor usage throughout a facility and help to identify areas with excessive compressed-air usage. The system can also be used with Ethernet-connected facility management systems that support the Modbus protocol.

SYSTEM OVERVIEW

A ZigBee network consists of a radio device called a coordinator and additional radio devices called routers and end devices. In a network of CDI flowmeters, the coordinator is built into an Ethernet to ZigBee gateway, and there is a router in each meter. The coordinator creates the wireless network, selecting the frequency and an identifying number, setting the security policy and allowing other devices to join. Each router provides communication from its associated meter and can also pass along messages to other devices. This allows messages to be passed over distances beyond the range of the individual radios.

MODBUS TCP OVERVIEW

A client device sends a request for data over the Ethernet to the gateway. The request is in the Modbus TCP format and contains the node address of a particular meter. The gateway contains a table relating node addresses to the MAC addresses of the radio modules in the network. Based on this table, the gateway sends the request over the wireless network to the appropriate meter. That meter responds with information that the gateway relays to the client device.

MODBUS FUNCTION CODES SUPPORTED:

03: read holding registers

04: read input registers

06: write single register

16: write multiple registers

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)

NETWORK CONFIGURATION

CDI configures each gateway and each radio module to provide the desired performance of the network. When a gateway is sold with a group of radio modules, the MAC addresses of the radio modules are programmed into the gateway. The gateway and the modules are also configured to prevent unwanted joining of the network and to provide encryption of communication within the network.

COMPONENTS OF CDI WIRELESS-NETWORKING SYSTEM

PART NUMBER	DESCRIPTION	SUGGESTED RANGE[1]	OUTPUT/SENSITIVITY[2]
RETROFIT DISPLAYS FOR EXISTING METERS			
CDI-WNL	Display circuit board with mounted low-power radio for retrofit	30 feet or 10 meters	+8 dBm / -102 dBm
CDI-WNH	Display circuit board with mounted high-power radio for retrofit	100 feet or 30 meters	+18 dBm / -101 dBm
WIRELESS OPTIONS FOR NEW METERS			
- WNL suffix applied to meter number	Low-power wireless output option added to meter	30 feet or 10 meters	+8 dBm / -102 dBm
- WNH suffix applied to meter number	High-power wireless output option added to meter	100 feet or 30 meters	+18 dBm / -101 dBm
GATEWAYS			
CDI-GWL	Low-power Ethernet-to-wireless gateway	30 feet or 10 meters	
CDI-GWH	High-power Ethernet-to-wireless gateway	100 feet or 30 meters	

[1] Ranges are based on line-of-sight in typical industrial applications.

[2] Radio module manufacturer's specifications.

The wireless networking system is based on components manufactured by Digi International. Links to relevant Digi documents and software are available at www.cdimeters.com/networking.

LIMITED WARRANTY

CDI warrants solely to the buyer that the Wireless Output Display Board shall be free from defects in materials and workmanship, when given normal, proper and intended usage, for three years from the date of purchase. During the warranty period, CDI will repair or replace (at its option) any defective product at no cost to the buyer. The foregoing warranty is in lieu of any other warranty, express or implied, written or oral (including any warranty of merchantability or fitness for a particular purpose). CDI's liability arising out of the manufacture, sale or supplying of the flowmeter, whether based on warranty, contract, tort or otherwise, shall not exceed the actual purchase price paid by the buyer, and in no event shall CDI be liable to anyone for special, incidental or consequential damages.

FCC NOTIFICATION

Products with "-WNL" suffix contain FCC ID MCQ-S2CTH; those with "-WNH" suffix contain FCC ID MCQ-PS2CTH.

This device complies with Part 15 of the FCC rules. Operation is subject to the following conditions: (1.) this device may not cause harmful interference and (2.) this device must accept any interference received, including interference that may cause undesired operation.