

## IQ NCC Network Communication Cartridge

### IQ™ v2.0 Central Control System

IQ NCC Network Communication Cartridges upgrade ESP-LX Series standalone controllers to IQ satellite controllers capable of being controlled by the IQ v2.0 Central Control Software. The NCC cartridge snaps into the back of the controller faceplate and provides the communication link between the IQ central computer and the remote site controllers.

### Applications

IQ is the perfect irrigation control solution for parks departments, school districts, property managers, landscape maintenance contractors, and water managers. IQ can manage small single-controller sites as well as large multi-controller sites. IQ NCC cartridges are compatible with the ESP-LXME traditionally-wired controllers with 1 to 48 station capacity and ESP-LXD 2-wire controllers with 1 to 200 station capacity.

IQ NCC cartridges are initially configured through a setup wizard provided in the ESP-LX Series Controller IQ Settings dial position. Communication setting parameters are configured through the IQ software or the IQ Configuration Software designed for netbook/laptop use on the job site.

### Direct Satellites

Single controller sites would use an IQ NCC cartridge configured as a Direct satellite. A Direct satellite has an IQ central computer communication connection but no network connections to other satellites in the system.

### Server & Client Satellites

Multi-controller sites would use one IQ NCC cartridge configured as a Server satellite and the other NCC cartridges configured as Client satellites. The Server satellite has an IQ central computer communication connection and shares this communication connection with the Client satellites though high-speed data cable or radios. The communication connection between Server and Client satellites is called the IQNet™. Satellites on a common IQNet can share weather sensors and master valves.

Server and Client satellites using high-speed data cable for IQNet communication require installation of an IQ CM Communication Module. Server and Client satellites using radio communication for IQNet communication require installation of an IQSSRADIO radio. Each cartridge kit includes cables to connect the NCC cartridge to connection module and/or radio.

### IQ NCC-PH Phone Cartridge

- Includes embedded 56K Telco Analog Phone Modem with RJ-11 port
- Includes RJ-11 modular phone cable
- Analog phone line required
- Used for Direct or Server Satellite applications requiring phone communication with the IQ central computer

### IQ NCC-GP GPRS/Cellular Cartridge

- Includes embedded GPRS/Cellular Data Modem with antenna connector
- Includes internal antenna for plastic controller enclosures (optional external antenna available for metal case controller enclosures)
- Requires GPRS/Cellular data service plan with static IP address from Cellular Service Provider
- Used for Direct or Server Satellite applications requiring wireless GPRS/Cellular communication with the IQ central computer

### IQ NCC-EN Ethernet Cartridge

- Includes embedded Ethernet Network Modem with RJ-45 port
- Includes RJ-45e patch cable
- Requires LAN network static IP address
- Used for Direct or Server Satellite applications requiring Ethernet LAN network communication with the IQ central computer

### IQ NCC-WF WiFi Cartridge

- Includes embedded WiFi Wireless Network Modem with antenna connector
- Includes internal antenna for plastic controller enclosures (optional external antenna available for metal case controller enclosures)
- Requires LAN wireless network static IP address
- Used for Direct or Server Satellite applications requiring WiFi LAN wireless network communication with the IQ central computer
- WPA/WPA2 encryption supported

### IQ NCC-RS RS232 Cartridge

- Includes RS-232 Port for IQ Direct Cable or External Modem communication connection to the IQ central computer
- Includes external modem cable (IQ Direct Cable provided with IQ Software Package)
- Used for Direct or Server Satellite applications requiring direct cable connection or external modem (radio or other 3rd-party device) communication with the IQ central computer
- User for Client Satellite applications requiring IQNet high-speed data cable or radio communication with the Server Satellite



### IQ FSCM-LXME Flow Smart Connection Module

- Provides IQNet high-speed data cable connections for ESP-LXME Controller
- Includes Flow Smart Module and Base Module functions
- Replaces standard ESP-LXME Base Module

### IQ CM-LXD Connection Module

- Provides IQNet high-speed data cable connections for ESP-LXD Controller
- Installs in ESP-LXD 0 (zero) module slot

### IQ SS-Radio Radio Modem

- Provides IQNet wireless radio communication between Server and Client satellite controllers
- Can also be used with the IQ NCC-RS RS232 Cartridge for IQ central computer to Direct or Server satellite radio communication
- Includes power supply and external antenna (programming software and cable provided separately)

### How To Specify

#### IQ NCC

IQ Network Communication Cartridge  
 IQ NCC-PH Phone  
 IQ NCC-GP GPRS/Cellular  
 IQ NCC-EN Ethernet  
 IQ NCC-WF WiFi  
 IQ NCC-RS RS232

#### IQ CM

IQ Connection Module  
 IQ FSCM-LXME for ESP-LXME  
 IQ CM-LXD for ESP-LXD

#### IQ SS-RADIO

IQ Radio Modem  
 IQ SS-RADIO

## Specifications

The irrigation central control system shall be the IQ v2.0 Central Control System as hereafter specified and as shown on the drawings. The system shall be fully programmable, providing the operator with absolute and full control of the entire control system. The system shall provide a degree of flexibility such that, in effect, anything that could be done at the satellite controller shall be capable of being done at the central computer.

The system hardware interface to the controller shall be the IQ NCC Network Communication Cartridge. The cartridge shall be designed to install in the ESP-LXME or ESP-LXD Series Controller faceplate. No tools shall be required for communication cartridge installation. The communication cartridge shall receive power through a ribbon cable connection to the controller front panel.

The communication cartridge shall be configured and monitored through a dedicated dial position on the controller front panel. In this dial position the communication cartridge shall be in control of the controller display and user interface softkeys. The user interface shall include a setup wizard to guide the user through the required configuration settings. The communication cartridge shall be user configurable as a Direct, Server, or Client satellite controller.

The communication cartridge shall incorporate 3 communication ports to communicate with the system central computer as well as communicate with other communication cartridge equipped controllers via high-speed data cable and/or radio communication. The communication cartridge shall incorporate status lights (LEDs) showing the real-time status of the cartridge communication ports.

Communication cartridges configured as a Direct satellite shall communicate directly with the system central computer via the primary (IQ) communication port. Configuring the communication cartridge as a Direct satellite shall disable the IQNet high-speed data cable (CM) and radio (Radio) communication ports.

Communication cartridges configured as a Server satellite shall communicate directly with the system central computer via the primary (IQ) communication port. Configuring the communication cartridge as a Server satellite shall enable the IQNet high-speed data cable (CM) and radio (Radio) communication ports for communication with Client satellite controllers. A single Server satellite shall be capable of networking up to 150 Client satellites across the IQNet network.

Communication cartridges configured as a Client satellite shall communicate via the IQNet network with a Server satellite. The Client satellite shall not have direct communication with the system central computer but shall instead use the Server satellite connection. Client satellite primary (IQ) communication port shall be disabled. Configuring the communication cartridge as a Client satellite shall enable the IQNet high-speed data cable (CM) and radio (Radio) communication ports for communication with a Server satellite controller.

Satellite controllers on a single IQNet network can share up to 8 master valves and 32 weather sensors. Master valves and weather sensors shall be shared across ESP-LXME traditionally-wired and ESP-LXD 2-wire controllers.

Communication Cartridges shall be available with internal Phone, GPRS/Cellular, Ethernet, & WiFi modems or RS-232 external modem port. Communication cartridges with GPRS/Cellular, Ethernet, and WiFi shall utilize static IP addresses for communication with the system central computer

The Phone communication cartridge shall incorporate an internal 56K analog telco modem. Connection to the site telephone service shall be via the provided RJ-11 cable. The Phone communication cartridge shall either accept incoming phone calls from the system central computer or be capable of initiating call to the system central computer at user designated times.

The GPRS/Cellular communication cartridge shall incorporate an Ethernet modem. Connection to the site local area network (LAN) shall be via the provided RJ-45e patch cable.

The Ethernet communication cartridge shall incorporate an Ethernet modem. Connection to the site local area network (LAN) shall be via the provided RJ-45e patch cable.

The WiFi communication cartridge shall incorporate a WiFi wireless modem. The communication cartridge shall be provided with an antenna.

The RS-232 communication cartridge shall incorporate an RS-232 Port for connection to an external modem. The communication cartridge shall be provided with an external modem cable.

Server and Client satellite controllers shall utilize a Connection Module to connect to the IQNet via high-speed data cable. The Connection Module shall be controlled by the cartridge CM port. Connection Modules shall provide quick connect terminals for connection to the 2 communication conductors as well as ground.

Server and Client satellite controllers shall utilize a Frequency Hopping Spread Spectrum Digital Radio for wireless communication on the IQNet. The radio shall be controlled by the cartridge Radio port. A connector cable to interconnect the cartridge and radio shall be supplied with the cartridge.

The system central computer shall be capable of upgrading (reflashing) the communication cartridge firmware through the IQ communication port. In this way, new features can be deployed to the without the need to replace the existing communication cartridges.

The communication cartridge shall keep a log of all controller and IQNet activity for upload to the system central computer.

The IQ v2.0 Central Control System™ shall be as manufactured by Rain Bird Corporation.

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