I-CON®

A WATTS Brand

Water Management Communicating Specifications

22. ELECTRONIC WATER CONTROL SYSTEM

A. I-CON Systems, LLC. COMMUNICATION WATER CLOSET AND LAVATORY CONTROL SYSTEM:

The I-CON Water Closet/Lavatory combination fixture control system shall be 24 VAC with low wattage power consumption. The System shall include soft close, industrial quality solenoid valves that do not include diaphragms. Any Lavatory valve that includes a diaphragm shall not be accepted. All sensor assemblies shall have stainless steel housing and shall be pressure activated with no mechanical moving components and completely waterproof. Each solenoid valve operator, and sensor, shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of solenoids and sensors. Electrical hook-up of sensor and solenoid valve shall be accomplished with modular plug type connectors. The microprocessor shall have the ability to control a total of one (1) or two (2) individual combination fixtures through programmable software. The software-controlled microprocessor shall incorporate electronic timing qualities for water conservation and time out functions to discourage misuse. The system shall include a solenoid operated non-metallic flush valve capable of achieving 1.6, 1.28 and 1.0 gallons per flush (on a 1.6 or 1.28 gallon per flush fixture). Flush Valve shall be third party tested, certified and listed by a recognized agency such as American Society of Sanitary Engineers (ASSE), for section 1037 (Pressurized Flushing Device). The flush valve shall have a “straight through” flow and the flush time shall not be controlled by a conventional metering flushometer diaphragm. The flush valve shall have a water inlet connection allowing the flush valve to swivel three hundred and sixty degrees. All microprocessors shall be controlled via wireless daughterboard communication.

B. I-CON Systems, LLC COMMUNICATION SECURITY SHOWER SYSTEM or equal:

The I-CON Electronic Shower Control System shall be electronic, and operate on 24 VAC, low wattage power consumption. The system shall include soft close, industrial quality solenoid valves. All sensor assemblies shall have stainless steel housing and shall be pressure activated with no mechanical moving components and completely waterproof. Each solenoid valve operator, and sensor, shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of solenoids and sensors. Electrical hook-up of sensor and solenoid valve shall be accomplished with modular plug type connectors. The software-controlled microprocessor shall have the ability to control a total of four (4) or eight (8) shower stations and shall incorporate electronic timing qualities for water conservation and to discourage misuse. All microprocessors shall be controlled through wireless daughter board communication.

C. SERVER/COMPUTER SYSTEM:

The server/computer shall include I-CON Touchscreen technology and shall display a graphical floor plan of the facility. Additionally, from any section of the floor plan, the touchscreen computer must show the statuses of the fixtures being controlled from subsequent sections. The computer shall have the ability to monitor and control individual, or groups of fixtures. The computer shall have the ability to display network information

over the graphical floor plan (i.e. serial numbers, port numbers, cable layouts, wireless device locations, etc.) by use of the Touchscreen Monitor only (no need of mouse or keyboard). The computer shall have the ability to create a computer file including time and date stamp, and time duration of all I-CON controllers' activity including run times, delay times and lockout periods on any fixture or group of fixtures by use of the Touchscreen Monitor. The computer shall have the ability to activate, or deactivate, and modify delays, run times, lockout criteria and periods on any fixture, or group of fixtures by use of the Touchscreen Monitor. The computer shall have the ability to disable the LED sensor indications by use of the Touchscreen Monitor. All I-CON controllers in the system shall function individually if the communication or the computer is disrupted. All I-CON controllers programmed settings shall be retained regardless of power loss. Each computer shall have the ability to be remotely located an unlimited distance from the associated I-CON controllers. All dedicated computers with a 1920x1080 resolution and Touchscreen monitor capability shall be provided by manufacturer and the hard drives shall be preprogrammed. All computers shall contain a minimum of 16 GB of RAM, 256 GB hard drive, Core i3 microprocessor and run a Linux operating system. A dedicated computer shall include the ability to be controlled from remote computers and including its graphical controlling area, access, and functions.

D. WIRELESS COMMUNICATION

Wireless RF communication at 2.4 GHz between controllers and their computer system is required. RF communication must be AES-128 encrypted. One (1) dedicated computer shall communicate through this communication link with an unlimited number of I-CON controllers. A hybrid (wireless and wire) communication link may ONLY be used to extend the wireless signal to extreme locations where wireless cannot penetrate hardened locations (impenetrable steel walls, impenetrable poured / impenetrable solid prefabbed concrete walls, etc.). Wireless repeaters shall be used to increase the network size by meshing additional I-CON controllers into the network. The wireless system must be a non-polling communication protocol. The bridges must be self-aware of communication and switch automatically between wired, and wireless based on communication activity. All I-CON controllers programmed settings shall be retained regardless of power loss. Each computer shall have the ability to be remotely located an unlimited distance from the associated I-CON controllers. All dedicated computers with a 1920x1080 resolution and Touch Screen monitor capability and all remote computers with a 1920x1080 resolution Touch Screen monitor capability shall be provided by manufacture and the hard drives shall be preprogrammed. All computers shall contain a minimum of 16 GB of RAM, 256 GB hard drive, Core i3 microprocessor, and run a Linux operating system. A dedicated computer shall include the ability to be controlled from remote computers and including its graphical controlling area, access, and functions.

E. CONNECTORS

Wire from pressure switch to control box and solenoid actuators to controller box shall be minimum of 24 AWG, four conductors, color coded (black, red, green, yellow), flat telephone type cable and be furnished with factory installed modular plug type connections. Sensor shall include a watertight connection, two foot from sensor, for ease of maintenance. Sensors and solenoid valve actuators shall be provided with a minimum of six (6) foot lead. Installer makes connections by simply inserting the modular plug type connector into the appropriate port.

F. CONTROLLER:

I-CON NEXUS® Pro 105008 Series Programmable controller shall be self-contained housing eight (8) input / output ports and shall include an integral on/off power switch located on the exterior, bottom, of the housing. Controller shall be housed in a water-resistant enclosure, with an inner O-ring seal and shall have no unsealed opening on the face of the lid to prevent water intrusion. Control board shall be equipped with wireless communication. Operation of both input/output ports (when activated) and power shall be viewed when watertight lid is closed by means of illumination. Each set of input / output ports has a standard predetermined designation (i.e. Port # 1 shall control the hot water lavatory spout; Port # 2 shall control the cold water to the lavatory spout; Port # 3 shall control the flush valve, and so on). The input port is sent a low voltage electrical impulse from the pressure-activated sensor. This impulse is transferred to the output port based on the programming function and the output port function is then controlled by the preprogrammed microprocessor. When output port transfers the electrical signal to the solenoid valve and the result is that water flows through the specified hardware (i.e. lavatory spout, shower head, etc.)

I-CON NEXUS® Pro 105004 Series Programmable controller shall be self-contained housing four (4) input / output ports and shall include an integral on/off power switch located on the exterior, bottom, of the housing. Controller shall be housed in a water-resistant enclosure, with an inner O-ring seal and shall have no unsealed opening on the face of the lid to prevent water intrusion. Control board shall be equipped with wireless communication. Operation of both input/output ports (when activated) and power shall be viewed when watertight lid is closed by means of illumination. Each set of input / output ports has a standard predetermined designation (i.e. Port # 1 shall control the hot water lavatory spout; Port # 2 shall control the cold water to the lavatory spout; Port # 3 shall control the flush valve, and so on). The input port is sent a low voltage electrical impulse from the pressure-activated sensor. This impulse is transferred to the output port based on the programming function and the output port function is then controlled by the preprogrammed microprocessor. When output port transfers the electrical signal to the solenoid valve and the result is that water flows through the specified hardware (i.e. lavatory spout, shower head, etc.)

I-CON NEXUS® Pro+ 105009 Series Programmable controller shall be self-contained housing eight (8) input / output ports and shall include an integral on/off power switch located on the exterior, bottom, of the housing. Controller shall be housed in a water-resistant enclosure, with an inner O-ring seal and shall have no unsealed opening on the face of the lid to prevent water intrusion. Control board shall be equipped with wireless communication. Operation of both input/output ports (when activated) and power shall be viewed when watertight lid is closed by means of illumination. Each set of input / output ports has a standard predetermined designation (i.e. Port # 1 shall control the hot water lavatory spout; Port # 2 shall control the cold water to the lavatory spout; Port # 3 shall control the flush valve, and so on). The input port is sent a low voltage electrical impulse from the pressure-activated sensor. This impulse is transferred to the output port based on the programming function and the output port function is then controlled by the preprogrammed microprocessor. When output port transfers the electrical signal to the solenoid valve and the result is that water flows through the specified hardware (i.e. lavatory spout, shower head, etc.)

I-CON NEXUS® Pro+ 105005 Series Programmable controller shall be self-contained housing four (4) input / output ports and shall include an integral on/off power switch located on the exterior, bottom, of the housing. Controller shall be housed in a water-resistant enclosure, with an inner O-ring seal and shall have no unsealed opening on the face of the lid to prevent water intrusion. Control board shall be equipped with wireless communication. Operation of both input/output ports (when activated) and power shall be viewed when watertight lid is closed by means of illumination. Each set of input / output ports has a standard predetermined designation (i.e. Port # 1 shall control the hot water lavatory spout; Port # 2 shall control the cold water to the lavatory spout; Port # 3 shall control the flush valve, and so on). The input port is sent a low voltage electrical impulse from the pressure-activated sensor. This impulse is transferred to the output port based on the programming function and the output port function is then controlled by the preprogrammed microprocessor. When output port transfers the electrical signal to the solenoid valve and the result is that water flows through the specified hardware (i.e. lavatory spout, shower head, etc.)

To examine and verify that the functions are operating, the control box shall contain an amber LED to show that power is at the control box, a green LED at each input port, and at each output port the LED must match the port type assigned. The green LED illuminates at the input port when the pressure sensor is activated, the LED at the output port illuminates when the solenoid operator is activated. The output port LED is illuminated for the duration of the preprogrammed run time.

Red LEDs are included to indicate when block times are in effect. These functions are typically used to control abuse of the flush valve output. When a red LED is illuminated, the output has been used too often in a given period of time, and the program is preventing the output solenoid from being activated. The output will be prevented from use as long as the fixture's associated red LED is illuminated.

STANDARD PROGRAM

1. Lavatory: Twenty (20) seconds hot water run time, ten (10) seconds cold water run time.

2. Flush Valve: Pressure sensor is activated. Flush valve cycle occurs immediately. If the procedure is repeated within five (5) minutes, then the flush valve is disabled for one (1) hour. Repeated pressure sensor operation has no effect on the one (1) hour block time.

3. Shower: Three (3) minute run time. If the user finishes the shower before the three-minute period user may press pressure sensor and run time terminates. Pressing the pressure sensor during the run time only terminates the cycle and will not extend the cycle.

G. LAVATORY MANIFOLD

I-CON SERIES ELEMENT® Lavatory Manifold shall include solenoid valve operators and provide hot and cold water for one (1), two (2) or four (4) lavatories depending on model chosen. Lavatory manifold valves shall be industrial quality and shall include solenoid valves without diaphragms. Any Lavatory valve that includes a diaphragm shall not be accepted. Manifold shall include 1/2" IPS hot and cold inlets, stainless steel strainers, check stops, 0.5 GPM flow regulator and soft close solenoid valve operators. Each solenoid valve operator shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector.

Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of solenoids. Water supply tubing from valve outlet to lavatory spout is 3/8" OD tubing. Each lavatory solenoid shall include a manual override feature to enable the
maintenance staff to turn on flow to the bubbler by bypassing the electronic circuitry in the event of power loss or during troubleshooting. The solenoid coil and plunger shall be interchangeable with the solenoid coil and plunger of the flush valve, shower valve, and lavatory valve to reduce spare part requirements. Lavatory valve check stops shall be interchangeable with the shower valves to reduce spare part requirements. Lavatory valve variations are: 104401 (Single Manifold Dual Temp), 102824 (Dual Manifold Dual Temp) and 100474 (Quad Manifold Dual Temp).

H. SHOWER MANIFOLD

I-CON SERIES 100438 Single Temp Shower Manifold shall include solenoid valve operators for one (1) or two (2) showerheads. Shower manifold valves shall be industrial quality and shall include solenoid valves without diaphragms. Any Shower valve that includes a diaphragm shall not be accepted. Manifold shall include one 1/2" IPS inlets, stainless steel strainer, check stop and soft close solenoid valve operators. Each solenoid valve operator shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of solenoids. Water supply tubing from valve outlet to lavatory spout is 1/2" OD tubing. Each shower solenoid shall include a manual override feature to enable the maintenance staff to turn on flow to the showerhead by bypassing the electronic circuitry in the event of power loss or during troubleshooting. The solenoid coil and plunger shall be interchangeable with the solenoid coil and plunger of the flush valve, shower valve, and lavatory valve to reduce spare part requirements. Shower valve check stops shall be interchangeable with the lavatory valves to reduce spare part requirements. A thermostatic mixing valve shall be installed to provide tempered water for the electronic shower valves (by others).

I. FLUSH VALVES

I-CON MOMENTUM® 100290 Series Flush Valve shall include plug-in connection and shall include a solenoid operated non-metallic flush valve capable of achieving 1.6, 1.28 and 1.0 gallons per flush (on a 1.6 or 1.28 gallon per flush fixture). Flush Valve shall be third party tested, certified and listed by a recognized agency such as American Society of Sanitary Engineers (ASSE), for section 1037 (Pressurized Flushing Device). Flush Valve shall be made of a non-metallic, corrosion resistant, material such as Zytel for extended durability and anti-corrosion properties. Each solenoid valve operator shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of solenoids. Flush valve shall include an external, adjustable flush activation control located on the valve that shall allow adjustment to compensate for calcium build-up in older fixtures. Flush Valve shall have manual override feature to enable the maintenance staff to flush toilet by bypassing the electronic circuitry in the event of power loss or during troubleshooting. The flush valve shall have a "straight through" flow and the flush time shall not be controlled by a conventional metering flushometer diaphragm. The flush valve shall have a water inlet connection allowing the flush valve to swivel three hundred and sixty degrees. The solenoid coil and plunger shall be interchangeable with the solenoid coil and plunger of the flush valve, shower valve,

and lavatory valve to reduce spare part requirements. In the event of a low-pressure occurrence, the flush valve shall automatically reset and not require any staff to manually reset the valves. Flush Valve shall come complete with a rough brass vacuum breaker tailpiece, vacuum breaker repair kit, brass 90-degree elbow fitting and tailpiece.

I-CON COBALT® SECURE 101826 Series Flush Valve shall include a plug in connection and shall include a solenoid operation. Flush valve shall be metallic body and include a ProLAST T-seal flushing mechanism and shall not be controlled by a conventional metering flushometer diaphragm. ProLAST® T-Seal shall include a single piece design with integral bypass filter, glass reinforced polymer and over molded seals. Flush valve shall include clog resistant dual bypass. Flush Valve shall be third party tested, certified and listed by a recognized agency such as American Society of Sanitary Engineers (ASSE), for section 1037 (Pressurized Flushing Device). Each solenoid valve operator shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of solenoids. Flush Valve shall be compatible with NEXUS® Pro 24AVC and NEXUS® 9V DC controllers. Flush Valve shall come complete with a rough brass vacuum breaker tailpiece, vacuum breaker repair kit, brass 90-degree elbow fitting and tailpiece.

J. TOUCH SENSOR BUTTON

I-CON Tru-TOUCH® 100215 Touch Sensor Button assemblies shall have stainless steel housing and shall be pressure activated with no mechanical moving components and completely waterproof. The sensor shall operate on a “strain gage” type principle and the sensor adjustment shall be self-calibrating. Each sensor shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of sensors. Sensors shall be pre-wired prior to shipment. The sensor button shall be interchangeable with the sensors for the flush valve, shower valve and lavatory valve.

I-CON Tru-TOUCH® LED 100146 (Toilets/Showers) Touch Sensor Button assemblies shall have stainless steel housing and shall be pressure activated with no mechanical moving components and completely waterproof. The sensor shall operate on a “strain gage” type principle and the sensor adjustment shall be self-calibrating. Sensor shall have a circular LED illumination ring mirroring the outer sensor edge for ease of viewing regardless of mounting orientation. Each sensor shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of sensors. Sensors shall be pre-wired prior to shipment. The sensor button shall be interchangeable with the sensors for the flush valve, shower valve and lavatory valve.

I-CON Tru-TOUCH® Pro LED 104332 (Toilets/Showers) Touch Sensor Button assemblies shall have stainless steel housing and shall be pressure activated with no mechanical moving components and completely waterproof. The sensor shall operate on a “strain gage” type principle and the sensor adjustment shall be self-calibrating. Sensor shall have four LEDs illuminating in a ring, the color of the LEDs shall match the port type assigned. The must be able to display status of the port it is connected to on the controller. The LEDs shall display runtime, number of uses left before lockout when less than four, and unusable. Each sensor shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching

watertight connector shall be supplied for connector to controller. Extensions are available at various lengths to allow for easy maintenance of sensors. Sensors shall be pre-wired prior to shipment. The sensor button shall be interchangeable with the sensors for the flush valve, shower valve and lavatory valve.

K. SOLENOIDS

I-CON Tru-FIRE® 100137 Solenoids shall have an integrated plunger core tube with plunger retainer. Solenoid plunger shall be the only moving part. Solenoids shall use no diaphragms. Wire connection to solenoid shall be water resistant and shall not be blade or spade connection type. Each solenoid shall be furnished with a minimum two (2) feet of flat telephone type cable with watertight connector. Extensions with matching watertight connector shall be supplied for connector to controller. Extensions shall be available at various lengths to allow for easy maintenance of sensors. The solenoids shall be interchangeable with the solenoids for the flush valve, shower valve and lavatory valve.

L. TRANSFORMERS

I-CON 100476 (plug-in) or 100111 (box mount) Transformers. One transformer is required for each control box. Connection from the transformer to the control box shall be made using 20/2 AWG (min.) to 18/2 (max.) wire. Transformer shall be 110 VAC, 60 Hz primary, 28 VAC 60 Hz secondary, 40 VA, Class II, overload protected.

M. MANUFACTURER'S EXPERIENCE

The work specified in this section is acknowledged to require special skills mastered by education and experience and must be provided by Manufacturers specializing in the production of Prison Electronic Plumbing Control Systems. Manufactures wishing to be pre-qualified for this project, shall have a minimum of twenty-five (25) years' experience in the design, manufacturing, and support of Electronic controls for correctional facilities and servicing of systems of the type and magnitude specified herein.

N. MANUFACTURER'S WARRANTY

The successful bidder shall provide a minimum of a one (1) year full warranty of all components provided. This shall include, but is not limited to, any rebuild parts and kits for any components, and/or new sensors, valves, control boards, and solenoids as required. This warranty shall not include damage or failure due to abuse, negligence or misuse