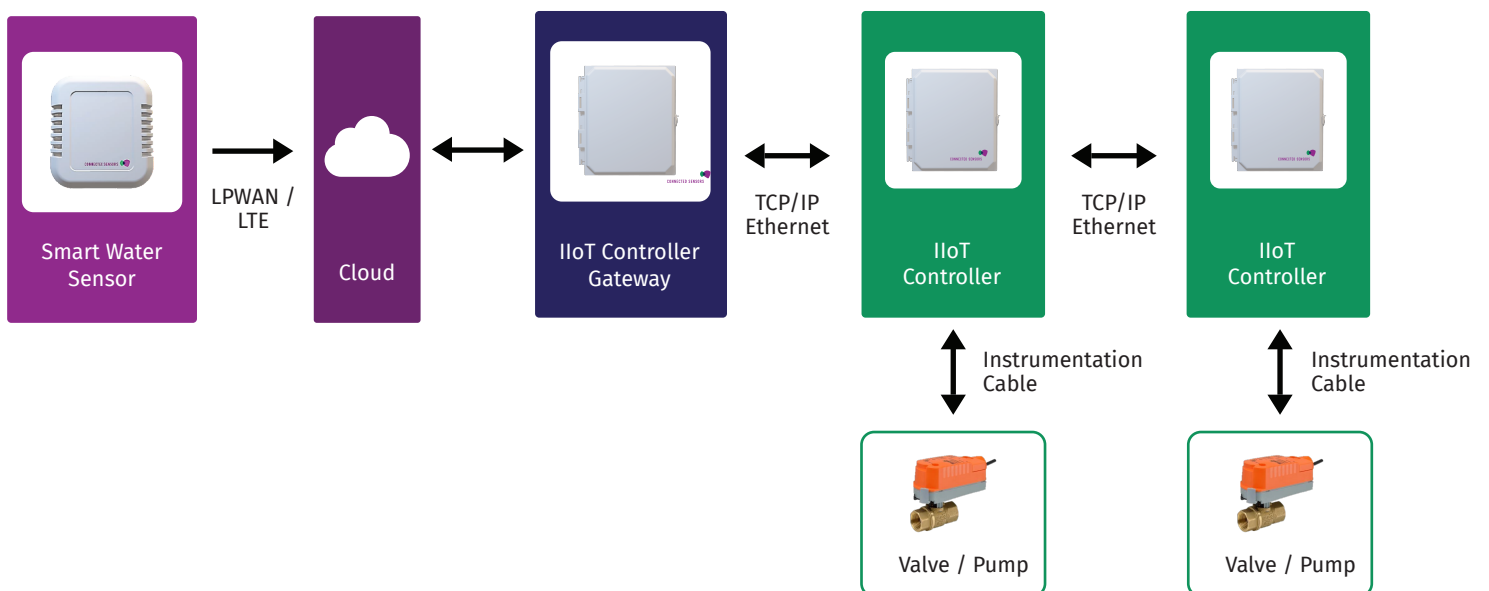# CS FLOOD MITIGATION SYSTEM

The CS-FMS (Flood Mitigation System) is a unified ecosystem that responds rapidly and precisely to water incidents, proactively safeguarding against potential damage while optimizing water usage throughout the building.

The system comprises two key components: the IIoT Controller Gateway and the IIoT Controllers. The IIoT Controller Gateway is the central control unit, receiving real-time data from smart water sensors strategically positioned throughout a building to detect water anomalies, such as leaks or floods. The Gateway makes informed decisions and issues commands to the IIoT Controllers by leveraging predefined algorithms and rules. These IIoT Controllers are connected to valves and pumps, allowing them to execute actions promptly, such as closing valves to mitigate water-related issues. This integrated system empowers property owners and managers with a comprehensive water management solution, ensuring business continuity and risk mitigation.

| Smart Water Sensor | → LPWAN / LTE | Cloud | ↔ | IIoT Controller Gateway | ↔ TCP/IP Ethernet | IIoT Controller | ↔ TCP/IP Ethernet | IIoT Controller |

IIoT Controller — Instrumentation Cable — Valve / Pump

IIoT Controller — Instrumentation Cable — Valve / Pump

CONNECTED SENSORS

IIoT CONTROLLER GATEWAY
MOXA AIG-101 Series

The IIoT Controller Gateway is the central coordinator between smart water sensors and the IIoT Controller. Its primary function is to enable automatic water shutoff in response to leak or flood incidents, either triggered by the sensors or scheduled control. To facilitate real-time monitoring and controller functionality, this intelligent gateway utilizes internet connectivity to establish seamless communication with the cloud. It also employs cutting-edge IIoT protocols and interfaces to ensure maximum availability and responsiveness while prioritizing security to safeguard data and system integrity.

KEY FEATURES

- Supports generic MQTT client
- Supports MQTT connection with built-in device
- SDKs for Azure/AWS cloud/ConnectedWater
- Supports Modbus RTU/ASCII/TCP master/client
- Supports Modbus TCP server
- Built-in network traffic monitoring and diagnostic tool for easy troubleshooting
- Supports data buffering using store and forward and datalogger

- Built-in data Cellular Backup with WAN interface
- 2-port Ethernet switch for daisy-chain topologies
- Configurable Firewall
- -40 to 70°C operating temperature range
- LTE Cat.1 US, EU, and APAC models available
- AC to DC Supply with UPS
- Can control up to 64 IIoT Controllers

CONNECTED SENSORS

IIoT CONTROLLER GATEWAY
TECHNICAL SPECIFICATIONS

ETHERNET INTERFACE

10/100BaseT(X) Ports (RJ45 connector)	2, Auto MDI/MDI-X connection
Magnetic Isolation Protection	1.5 kV (built-in)

ETHERNET SOFTWARE FEATURES

Industrial Protocols	Modbus TCP Client (Master) / Server (Slave)
	Generic MQTT
	Azure IoT Device
	AWS IoT Core
Configuration Options	Web Console (HTTP/HTTPS)
Time Management	NTP Client
	GPS

SERIAL INTERFACE

No. of Ports	2
Connector	DB9 male
Serial Standards	RS-232/422/485
Baudrate	300 bps to 921.6 kbps
Data Bits	7, 8
Parity	None, Even, Odd, Space, Mark
Stop Bits	1, 2
Flow Control	RTS/CTS

SERIAL SIGNALS

RS-232	TxD, RxD, RTS, CTS, DTR, DSR, DCD, GND
RS-422	Tx+, Tx-, Rx+, Rx-, GND
RS-485-2w	Data+, Data-, GND
RS-485-4w	Tx+, Tx-, Rx+, Rx-, GND

CELLULAR INTERFACE

No. of SIMs	2
GPS Antenna Connectors	SMA x 1
Band Options Band 14 (700 MHz) /	**US Model:** **LTE Bands:** Band 2 (1900 MHz) / Band 4 (1700 MHz) / Band 5 (850 MHz) / Band 12 (700 MHz) / Band 13 (700 MHz) / Band 66 (1700 MHz) / Band 71 (600 MHz) **UMTS Bands:** 2 (1900 MHz) / Band 4 (1700 MHz) / Band 5 (850 MHz) **Carrier Approval:** Verizon, AT&T **EU Model:** **LTE Bands:** Band 1 (2100 MHz) / Band 3 (1800 MHz) / Band 7 (2600 MHz) / Band 8 (900 MHz) / Band 20 (800 MHz) / Band 28 (700 MHz) **UMTS Bands:** Band 1 (2100 MHz) / Band 3 (1800 MHz) Band 8 (900 MHz) **AP Model:** **LTE Bands:** Band 1 (2100 MHz) / Band 3 (1800 MHz) / Band 5 (850 MHz) / Band 8 (900 MHz) / Band 28 (700 MHz) **UMTS Bands:** Band 1 (2100 MHz) / Band 5 (850 MHz) / Band 8 (900 MHz)

SERIAL SOFTWARE FEATURES

Industrial Protocols	Modbus RTU/ASCII Master

MODBUS RTU/ASCII

Mode	Master
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Commands	256 per port

MODBUS TCP

Mode	Server (Slave) Client (Master)
Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Max. No. of Client Connections	4
Max. No. of Server Connections	64
Max. No. of Commands	1500

GENERIC MQTT CLIENT

Versions Supported	v3.1.1 | v3.1
QoS Levels	0, 1, 2
Authentication Methods	Username and password
Secure Transmission	TLS 1.0, TLS 1.1, TLS 1.2
Native Capabilities	Keep Alive
	Retain Message
	Clean Session
	Will and Testament
Moxa Functions	Store and Forward
	Custom Payload
	Remote API Invocation

AZURE IOT DEVICE

Connection Protocols Supported	MQTT, MQTT over WebSockets
	AMQP, AMQP over WebSockets
Authentication Methods	Symmetric Key
	X.509 Certificate
Azure Direct Methods	Reboot
	Software Upgrade
	Remote API Invocation
Moxa Functions	Store and Forward
	Custom Payload

AWS IOT CORE

QoS Levels	0,1
Authentication Methods	X.509 Certificate
	Private Key
	Trusted Root CA
Native Capabilities	Keep Alive
Moxa Functions	Store and Forward
	Custom Payload
Commands Invokable Via	Jobs Reboot
	Software Upgrade
	Remote API Invocation

MEMORY

microSD Slot	Up to 32 GB (SD 2.0 compatible)
	Max. No. of Tags Supported: 1500

POWER PARAMETERS

Input Voltage	9 to 36 VDC
Power Connector	Screw-fastened Euroblock terminal
Power Consumption	8 W (max.)

PHYSICAL CHARACTERISTICS

Dimensions	128.5 x 89.1 x 41 mm (5.06 x 3.51 x 1.61 in)
Housing	Metal
Installation	DIN-rail mounting
	Wall mounting (with optional kit)
Weight	AIG-101-T: 492 g (1.08 lb), AIG-101-T-AP/EU/US: 512 g (1.13 lb)

Without Enclosure

With Enclosure

ENVIRONMENTAL LIMITS

Ambient Relative Humidity	5 to 95% (non-condensing)
Operating Temperature	-40 to 70°C (-40 to 158°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)

STANDARDS & CERTIFICATIONS

EMC	EN 55032/35
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
	IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
	IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
	IEC 61000-4-5 Surge: Power: 1 kV; Signal: 1 kV
	IEC 61000-4-6 CS: 10 V
	IEC 61000-4-8 PFMF
Safety	IEC 62368-1, UL 62368-1, EN 62368-1
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-64
	5 Grms @ 5 to 500 Hz, random wave, 1 hr per axis (without USB devices attached)
Cellular Standards	EN 303 413 (GPS), EN 301 908-1 (WCDMA/LTE), EN 301 908-2/-13 (WCDMA/LTE), EN 301 489-1/-19, EN 301 489-1/-52, EN 62311
Radio Frequency	FCC, PTCRB, RCM
Carrier Approvals	Verizon, AT&T
Green Product	RoHS, CRoHS, WEEE

MTBF

Time	566,458 hrs
Standards	Telcordia SR332

WARRANTY

Warranty Period	5 years
Details See	www.moxa.com/warranty

PACKAGE CONTENTS

Device	1 x AIG-101 Series gateway
Cable	1 x terminal block to power jack converter
Installation Kit	1 x DIN-rail kit
Documentation	1 x quick installation guide
	1 x warranty card

IIoT CONTROLLER (BRIDGE)
MOXA ioLogik E1200 Series

This controller is designed to seamlessly interface with a wide range of third-party valves, pumps, and BMS (Building Management System) solutions using discrete IO signals. Each individual controller is capable of activating and controlling up to six different endpoints, and can manage a maximum cable run of 30 meters between the controller and the valve, ensuring flexibility in system layout. Furthermore, for each channel, there is a dedicated input channel meticulously configured to provide essential feedback to the control system, confirming the successful closure of valves and the completion of actions. In cases where PLC and BMS system integrations are necessary but not inherently compatible with the provided interface, additional equipment may be required to facilitate seamless communication

KEY FEATURES

- ✓ User-definable Modbus TCP Slave addressing
- ✓ Supports RESTful API for IIoT applications
- ✓ Supports EtherNet/IP Adapter
- ✓ 2-port Ethernet switch for daisy-chain topologies
- ✓ Saves time and wiring costs with peer-to-peer communications
- ✓ Supports SNMP v1/v2c

- ✓ Easy mass deployment and configuration with ioSearch utility
- ✓ Friendly configuration via web browser
- ✓ Wide operating temperature models available for -40 to 75°C (-40 to 167°F) environments
- ✓ AC to DC Supply with UPS
- ✓ UPS Standby Time Depends on Configuration

CONNECTED SENSORS

www.**connectedsensors**.ca
info@connectedsensors.ca

IIoT CONTROLLER (BRIDGE)
TECHNICAL SPECIFICATIONS

INPUT/ OUTPUT INTERFACE

Digital Input Channels	ioLogik E1210 Series: 16
	ioLogik E1212/E1213 Series: 8
	ioLogik E1214 Series: 6
	ioLogik E1242 Series: 4
Digital Output Channels	ioLogik E1211 Series: 16
	ioLogik E1213 Series: 4
Configurable DIO Channels (by jumper)	ioLogik E1212 Series: 8
	ioLogik E1213/E1242 Series: 4
Relay Channels	ioLogik E1214 Series: 6
Analog Input Channels	ioLogik E1240 Series: 8
	ioLogik E1242 Series: 4
Analog Output Channels	ioLogik E1241 Series: 4
RTD Channels	ioLogik E1260 Series: 6
Thermocouple Channels	ioLogik E1262 Series: 8
Isolation	3k VDC or 2k Vrms
Buttons	Reset button

DIGITAL INPUTS

Connector	Screw-fastened Euroblock terminal
Sensor Type	Dry contact
	Wet contact (NPN or PNP)
I/O Mode	DI or event counter
Dry Contact	On: short to GND
	Off: open
Wet Contact (DI to COM)	On: 10 to 30 VDC
	Off: 0 to 3 VDC
Counter Frequency	250 Hz
Digital Filtering Time Interval	Software configurable
Points per COM	ioLogik E1210/E1212 Series: 8 channels
	ioLogik E1213 Series: 12 channels
	ioLogik E1214 Series: 6 channels
	ioLogik E1242 Series: 4 channels

DIGITAL OUTPUTS

Connector	Screw-fastened Euroblock terminal
I/O Type	ioLogik E1211/E1212/E1242 Series: Sink
	ioLogik E1213 Series: Source
I/O Mode	DO or pulse output
Current Rating	ioLogik E1211/E1212/E1242 Series: 200 mA per channel
	ioLogik E1213 Series: 500 mA per channel
Pulse Output Frequency	500 Hz (max.)
Over-Current Protection	ioLogik E1211/E1212/E1242 Series: 2.6 A per channel @ 25°C
	ioLogik E1213 Series: 1.5 A per channel @ 25°C
Over-Temperature Shutdown	175°C (typical), 150°C (min.)
Over-Voltage Protection	35 VDC

RELAYS

Connector	Screw-fastened Euroblock terminal
Type	Form A (N.O.) power relay
I/O Mode	Relay or pulse output
Pulse Output Frequency	0.3 Hz at rated load (max.)
Contact Current Rating	Resistive load: 5 A @ 30 VDC, 250 VAC, 110 VAC
Contact Resistance	100 milli-ohms (max.)
Mechanical Endurance	5,000,000 operations
Electrical Endurance	100,000 operations @ 5 A resistive load
Breakdown Voltage	500 VAC
Initial Insulation Resistance	1,000 mega-ohms (min.) @ 500 VDC
Note	Ambient humidity must be non-condensing and remain between 5 and 95%. The relays may malfunction when operating in high condensation environments below 0°C.

ANALOG INPUTS

Connector	Screw-fastened Euroblock terminal
I/O Mode	Voltage/Current
I/O Type	Differential
Resolution	16 bits
Input Range	0 to 10 VDC, 0 to 20 mA, 4 to 20 mA, 4 to 20 mA (with burn-out detection)
Accuracy	ioLogik E1240/E1242: ±0.1% FSR @ 25°C ±0.3% FSR @ -10 to 60°C

ANALOG INPUTS

Accuracy	ioLogik E1240-T/E1242-T: ±0.1% FSR @ 25°C ±0.3% FSR @ -10 to 60°C ±0.5% FSR @ -40 to 75°C
Sampling Rate	**ioLogik E1240:** 12 samples/sec per module (shared between up to 8 channels)2 **ioLogik E1242:** 12 samples/sec per module (shared between up to 4 channels)2
Built-in Resistor for Current Input	120 ohms
Input Impedance	10 mega-ohms (min.)

ANALOG OUTPUTS

Connector	Screw-fastened Euroblock terminal
I/O Mode	Voltage/Current
Output Range	0 to 10 VDC 0 to 20 mA 4 to 20 mA
Resolution	12-bit
Accuracy	**ioLogik E1241:** ±0.1% FSR @ 25°C ±0.3% FSR @ -10 to 60°C **ioLogik E1241-T:** ±0.1% FSR @ 25°C ±0.3% FSR @ -40 to 75°C
Load (Current Mode)	Internal power: 400 ohms (max.)
24 V external power:	1000 ohms (max.)
Voltage Output Short-Circuit Protection	10 mA

RTDS

Connector	Screw-fastened Euroblock terminal
Sensor Type	PT1000 (-200 to 350°C) PT50, PT100, PT200, PT500 (-200 to 850°C)
Resistance Type	310, 620, 1250, and 2200 ohms
Input Connection	2- or 3-wire
Sampling Rate	ioLogik E1260: 12 samples/sec per module (shared between up to 6 channels)3
Resolution	0.1°C or 0.1 ohms

RTDS

Accuracy	ioLogik E1260:
	±0.1% FSR @ 25°C
	±0.3% FSR @ -10 to 60°C
	ioLogik E1260-T:
	±0.1% FSR @ 25°C
	±0.3% FSR @ -40 to 75°C
Input Impedance	625 kilo-ohms (min.)

THERMOCOUPLES

Connector	Screw-fastened Euroblock terminal
Sensor Type	J, K, T, E, R, S, B, N
Millivolt Type	±19.532 mV
	±39.062 mV
	±78.126 mV
	Fault and over-voltage protection: -35 to +35 VDC (power off); -25 to +30 VDC (power on)
Resolution	16 bits
Millivolt Accuracy	**ioLogik E1262:**
	±0.1% FSR @ 25°C
	±0.3% FSR @ -10 to 60°C
	ioLogik E1262-T:
	±0.1% FSR @ 25°C
	±0.3% FSR @ -40 to 75°C
TC Accuracy Types	J, T, E, S, B: ±5°C
Types	K, R, N: ±8°C
CJC Accuracy	±0.5°C @ 25°C
	±1.5°C @ -40 to 75°C
Sampling Rate	ioLogik E1262: 12 samples/sec per module (shared between up to 8 channels)3
Input Impedance	10 mega-ohms (min.)

ETHERNET SOFTWARE FEATURES

Configuration Options	Web Console (HTTP), Windows Utility (ioSearch), MCC Tool
Industrial Protocols	Modbus TCP Server (Slave), Moxa AOPC (Active Tag), MXIO Library, EtherNet/IP Adapter
Management	RESTful API, SNMPv1/v2c, SNMPv1 Trap, HTTP, DHCP Client, BOOTP, IPv4, TCP/IP, UDP
MIB Device Settings	MIB
Security	Access control list

SECURITY FUNCTIONS

Authentication	Local database

LED INTERFACE

LED Indicators	Power, Ready, Port 1, Port 2

MODBUS TCP

Functions Supported	1, 2, 3, 4, 5, 6, 15, 16, 23
Mode	Server (Slave)
Max. No. of Client Connections	10

ETHERNET/IP

|	
Mode	Adapter
Max. No. of Scanner Connections	9 (for read-only), 1 (for read/write)

POWER PARAMETERES

|	
Power Connector	Screw-fastened Euroblock terminal
No. of Power Inputs	1
Input Voltage	12 to 36 VDC
Power Consumption	ioLogik E1210 Series: 110 mA @ 24 VDC
	ioLogik E1211 Series: 200 mA @ 24 VDC
	ioLogik E1212 Series: 155 mA @ 24 VDC
	ioLogik E1213 Series: 130 mA @ 24 VDC
	ioLogik E1214 Series: 188 mA @ 24 VDC
	ioLogik E1240 Series: 121 mA @ 24 VDC
	ioLogik E1241 Series: 194 mA @ 24 VDC
	ioLogik E1242 Series: 139 mA @ 24 VDC
	ioLogik E1260 Series: 110 mA @ 24 VDC

PHYSICAL CHARACTERISTICS

Housing	Plastic
Dimensions	27.8 x 124 x 84 mm (1.09 x 4.88 x 3.31 in)
Weight	200 g (0.44 lb)
Installation	DIN-rail mounting, Wall mounting
Wiring	I/O cable, 16 to 26 AWG
	Power cable, 12 to 24 AWG

Without Enclosure

Front View   Side View   Rear View

Top View

Bottom View
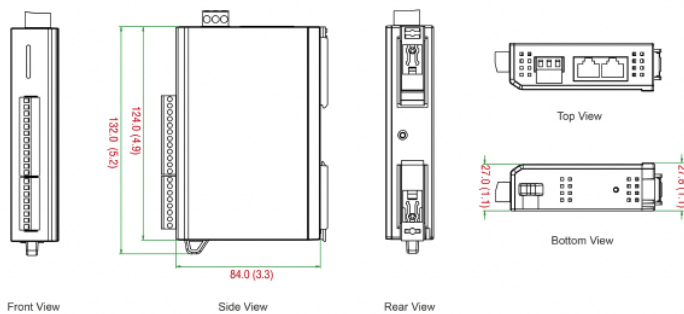
With Enclosure
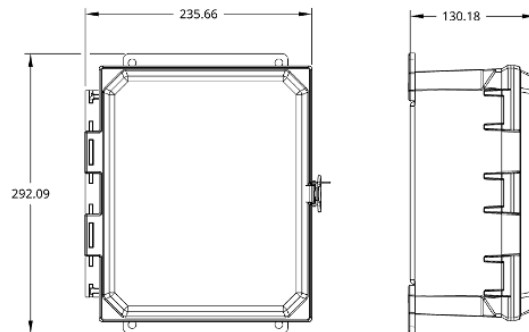
ENVIRONMENTAL LIMITS

Operating Temperature	Standard Models: -10 to 60°C (14 to 140°F)
	Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature (package included)	-40 to 85°C (-40 to 185°F)
Ambient Relative Humidity	5 to 95% (non-condensing)
Altitude	4000 m4

STANDARDS AND CERTIFICATIONS

EMC	EN 55032/24, EN 61000-6-2/-6-4
EMI	CISPR 32, FCC Part 15B Class A
EMS	IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
	IEC 61000-4-3 RS: 80 MHz to 1 GHz: 10 V/m
	IEC 61000-4-4 EFT: Power: 2 kV; Signal: 1 kV
	IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV
	IEC 61000-4-6 CS: 10 V
	IEC 61000-4-8 PFMF
Hazardous Locations	ATEX, Class I Division 25
Safety	UL 508
Shock	IEC 60068-2-27
Freefall	IEC 60068-2-32
Vibration	IEC 60068-2-6

DECLARATION

Green Product	RoHS, CRoHS, WEEE

MTBF

Time	ioLogik E1210 Series: 671,345 hrs
	ioLogik E1211 Series: 923,027 hrs
	ioLogik E1212 Series: 561,930 hrs
	ioLogik E1213 Series: 715,256 hrs
	ioLogik E1214 Series: 808,744 hrs
	ioLogik E1240 Series: 474,053 hrs
	ioLogik E1241 Series: 888,656 hrs
	ioLogik E1242 Series: 502,210 hrs
	ioLogik E1260 Series: 660,260 hrs
	ioLogik E1262 Series: 631,418 hrs
Standards	Telcordia SR332

WARRANTY

Warranty Period	ioLogik E1214: 2 years6
	ioLogik: E1210 / E1211/ E1212/ E1213/ E1240/ E1241/ E1242/ E1260/ E1262: 5 years
Details	See www.moxa.com/warranty

PACKAGE CONTENTS

Device	1 x ioLogik E1200 Series remote I/O
Installation Kit	1 x terminal block, 8-pin, 3.81 mm
	1 x terminal block, 12-pin, 3.81 mm
	1 x terminal block, 3-pin, 5.00 mm
Documentation	1 x quick installation guide
	1 x warranty card

CONNECTED SENSORS