

ioThinX 4510 Series

Advanced modular remote I/O adapter with built-in serial ports



Features and Benefits

- Easy tool-free installation and removal
- Easy web configuration and reconfiguration
- Built-in Modbus RTU gateway function
- Supports Modbus/SNMP/RESTful API/MQTT
- Supports SNMPv3, SNMPv3 Trap, and SNMPv3 Inform with SHA-2 encryption
- Supports up to 32 I/O modules
- -40 to 75°C wide operating temperature model available

Certifications

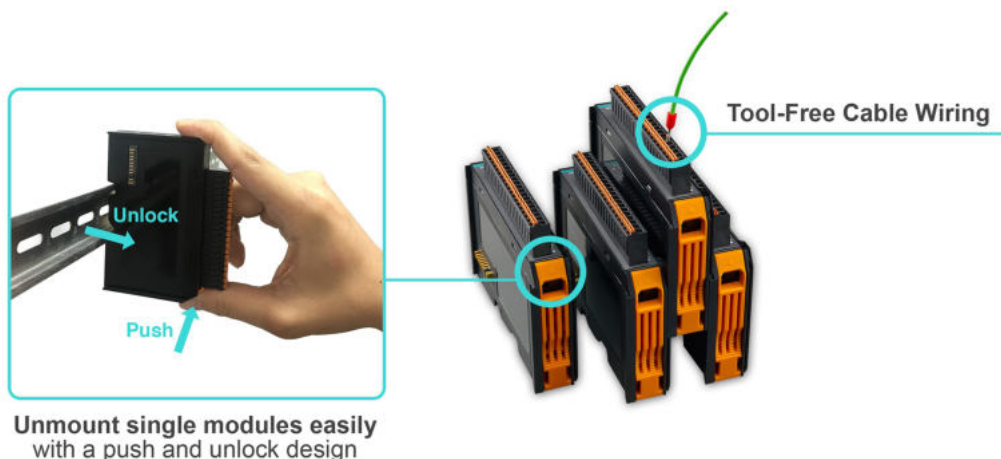


Introduction

The ioThinX 4510 Series is an advanced modular remote I/O product with a unique hardware and software design, making it an ideal solution for a variety of industrial data acquisition applications. The ioThinX 4510 Series has a unique mechanical design that reduces the amount of time required for installation and removal, simplifying deployment and maintenance. In addition, the ioThinX 4510 Series supports Modbus RTU Master protocol for retrieving field site data from serial meters and also supports OT/IT protocol conversion.

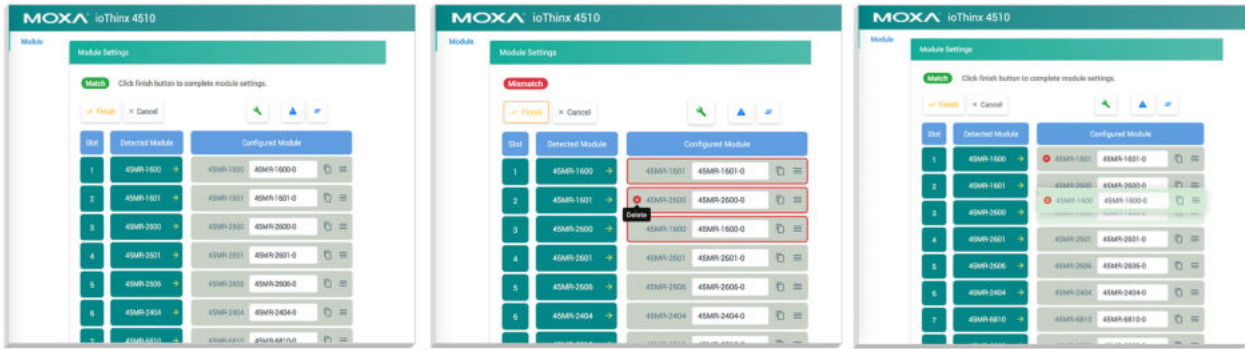
Easy Tool-Free Installation and Removal

The ioThinX 4500 Series has a unique mechanical design that reduces the amount of time required for installation and removal. In fact, screwdrivers and other tools are not required for any part of the hardware installation, including mounting the device on a DIN-rail, as well as connecting the wiring for both communication and I/O signal acquisition. Furthermore, no tools are required to remove the ioThinX from a DIN-rail. Removing all of the modules from a DIN-rail is also easy using the latch and release tab.



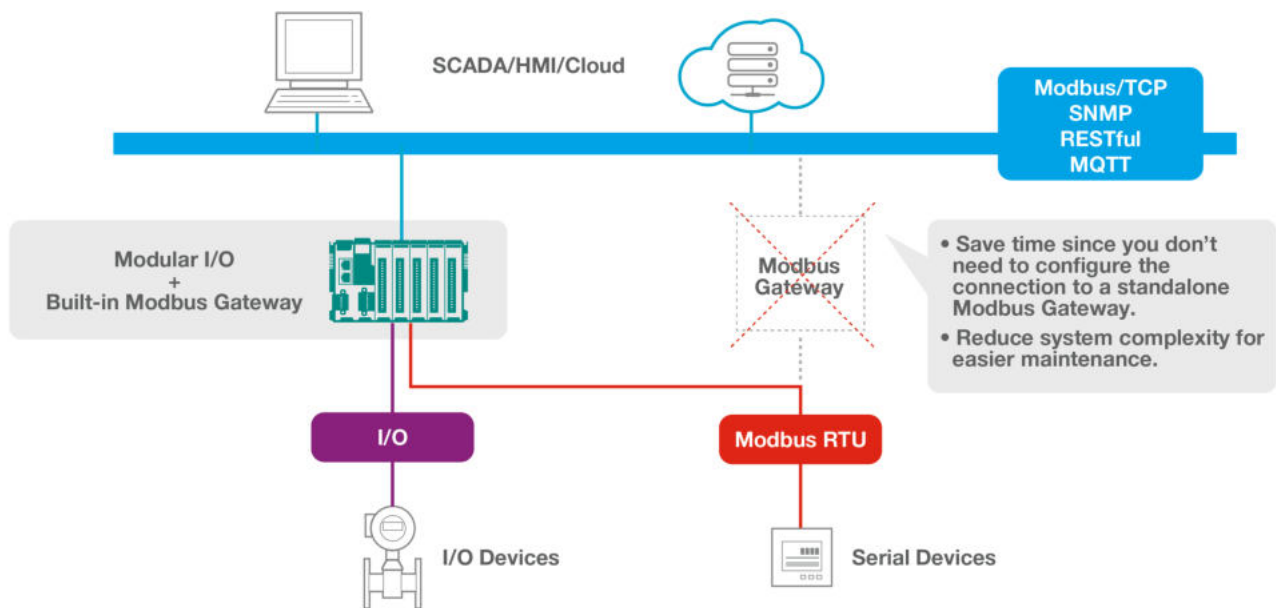
Easy Web Configuration/Reconfiguration

For modular remote I/O setups, one of the greatest difficulties is duplicating configuration settings to the current modules with different module combinations. After adding, moving, or deleting one of the modules, settings of the unchanged modules, including the Modbus address and RESTful APIs to the upper software, need to be reconfigured. The ioThinX 4510's user-friendly web configuration tool was designed specifically to make configuration and reconfiguration easy; no reconfiguration efforts are required for the unchanged modules. In addition, the ioThinX 4510's web interface supports module/channel unique names. This feature also applies to Modbus TCP, MQTT, and RESTful API, saving users considerable amounts of time on development and deployment.



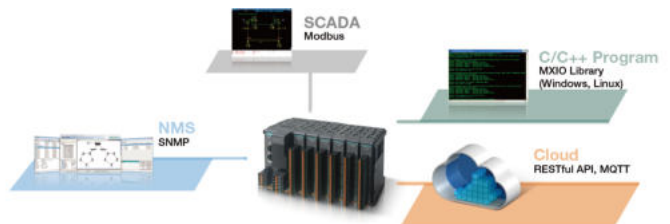
Built-In Modbus RTU Gateway Function

The ioThinx 4510 supports Modbus RTU Master for retrieving field site data from serial meters. After collecting data, users can convert serial data to a variety of protocols, including Modbus TCP, SNMP, MQTT, and RESTful, allowing users to get field site data in their protocol of choice. This two-in-one design reduces system complexity and the amount of space required in the network topology, as well as overall installation time. In addition, you can extend the useful life of legacy devices by connecting them to Ethernet and accessing the devices using a preferred protocol.



I/O to IT/OT Protocol Conversion

The ioThinx 4510 does just what you need by supporting the most often-used protocols for retrieving I/O data. Most IT engineers use SNMPv1/v2c/v3, MQTT, or RESTful API protocols, but IA engineers are more familiar with Operational Technologies (OT), such as Modbus. The ioThinx 4510 makes it possible for both IT and OT engineers to conveniently retrieve data from the same I/O device. The ioThinx 4510 speaks several different protocols, including Modbus TCP for OT engineers, as well as SNMP, MQTT, and RESTful API for IT engineers. The ioThinx 4510 retrieves I/O data and converts the data to any of these protocols, allowing you to get your applications connected easily and effortlessly.



Specifications

Input/Output Interface

| | |
|-----------------|-----------------------|
| Buttons | Reset button |
| Expansion Slots | Up to 32 ¹ |
| Isolation | 3k VDC or 2k Vrms |

1. Compatible with the ioThinx 4500 Series (45MR) Modules only

Ethernet Interface

| | |
|---------------------------------------|------------------------------------|
| 10/100BaseT(X) Ports (RJ45 connector) | 2, 1 MAC address (Ethernet bypass) |
| Magnetic Isolation Protection | 1.5 kV (built-in) |

Ethernet Software Features

| | |
|-----------------------|--|
| Configuration Options | Web Console (HTTP/HTTPS), Windows Utility (IOExpress) |
| Industrial Protocols | Modbus TCP Server (Slave), RESTful API, SNMPv1/v2c/v3, SNMPv1/v2c/v3 Trap, SNMPv2c/v3 Inform, MQTT |
| Management | SNMPv1/v2c/v3, SNMPv1/v2c/v3 Trap, SNMPv2c/v3 Inform, DHCP Client, IPv4, HTTP, UDP, TCP/IP |

Serial Interface

| | |
|------------------|---------------------------------------|
| Connector | Spring-type Euroblock terminal |
| Serial Standards | RS-232/422/485 |
| No. of Ports | 1 x RS-232/422 or 2 x RS-485 (2 wire) |
| Baudrate | 1200 bps to 115.2 kbps |
| Flow Control | RTS/CTS |
| Parity | None, Even, Odd |
| Stop Bits | 1, 2 |
| Data Bits | 8 |

Serial Signals

| | |
|-----------|-------------------------|
| RS-232 | TxD, RxD, RTS, CTS, GND |
| RS-422 | Tx+, Tx-, Rx+, Rx-, GND |
| RS-485-2w | Data+, Data-, GND |

Serial Software Features

| | |
|----------------------|-------------------|
| Industrial Protocols | Modbus RTU Master |
|----------------------|-------------------|

System Power Parameters

| | |
|-------------------------|--------------------------------|
| Power Connector | Spring-type Euroblock terminal |
| No. of Power Inputs | 1 |
| Input Voltage | 12 to 48 VDC |
| Power Consumption | 800 mA @ 12 VDC |
| Over-Current Protection | 1 A @ 25°C |
| Over-Voltage Protection | 55 VDC |
| Output Current | 1 A (max.) |

Field Power Parameters

| | |
|---------------------|--------------------------------|
| Power Connector | Spring-type Euroblock terminal |
| No. of Power Inputs | 1 |
| Input Voltage | 12/24 VDC |

| | |
|-------------------------|--------------|
| Over-Current Protection | 2.5 A @ 25°C |
| Over-Voltage Protection | 33 VDC |
| Output Current | 2 A (max.) |

Physical Characteristics

| | |
|--------------|---|
| Wiring | Serial cable, 16 to 28 AWG Power cable, 12 to 26 AWG |
| Strip Length | Serial cable, 9 to 10 mm Power cable, 12 to 13 mm |
| Housing | Plastic |
| Dimensions | 42.3 x 99 x 75 mm (1.67 x 3.9 x 2.95 in) |
| Weight | 173.5 g (0.382 lb) |
| Installation | DIN-rail mounting |

Environmental Limits

| | |
|--|---|
| Operating Temperature | ioThinX 4510: -20 to 60°C (-4 to 140°F) ioThinX 4510-T: -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 | Up to 4000 m ² |

Standards and Certifications

| | |
|-----------|--|
| Safety | UL 61010-2-201 |
| EMC | EN 55032/24 |
| 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: 3 V/m IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV IEC 61000-4-5 Surge: Power: 2 kV; Signal: 1 kV IEC 61000-4-6 CS: 3 V IEC 61000-4-8 PFMF |
| Shock | IEC 60068-2-27 |
| Vibration | IEC 60068-2-6 |

Declaration

| | |
|---------------|-------------------|
| Green Product | RoHS, CRoHS, WEEE |
|---------------|-------------------|

MTBF

| | |
|-----------|-----------------|
| Time | 1,451,040 hrs |
| Standards | Telcordia SR332 |

Warranty

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

2. Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

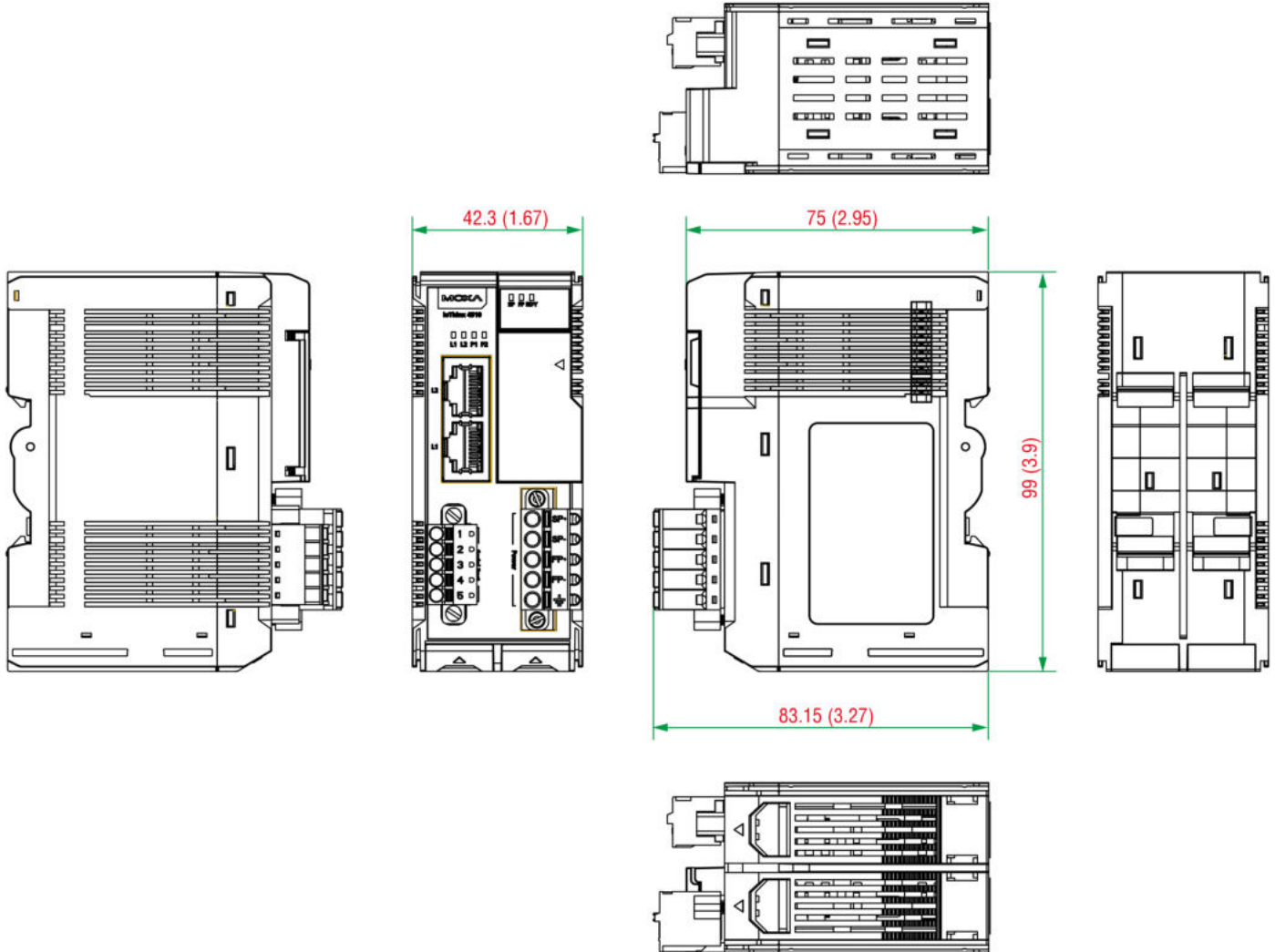
Package Contents

| | |
|------------------|--|
| Device | 1 x ioThinx 4510 Series remote I/O |
| Installation Kit | 1 x terminal block, 5-pin, 5.00 mm 1 x terminal block, 5-pin, 3.81 mm |
| Documentation | 1 x quick installation guide 1 x warranty card |

Dimensions

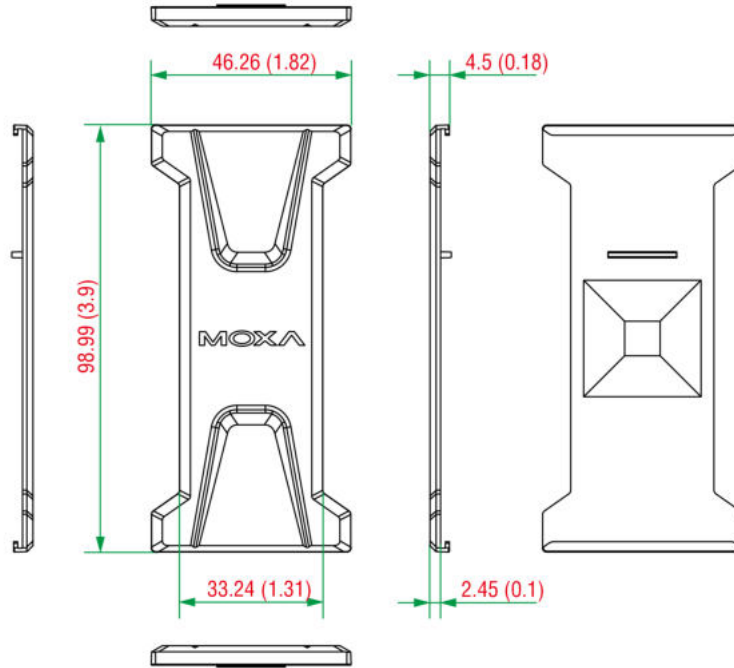
Top/Side/Bottom Panels

Unit: mm (inch)



Side Cover

Unit: mm (inch)



Ordering Information

| Model Name | Ethernet Interface | Serial Interface | No. of Support I/O Modules | Operating Temp. |
|----------------|--------------------|----------------------|----------------------------|-----------------|
| ioThinX 4510 | 2 x RJ45 | RS-232/RS-422/RS-485 | 32 | -20 to 60°C |
| ioThinX 4510-T | 2 x RJ45 | RS-232/RS-422/RS-485 | 32 | -40 to 75°C |

Accessories (sold separately)

I/O Modules

| | |
|-------------|---|
| 45MR-1600 | Module for the ioThinX 4500 Series, 16 DIs, 24 VDC, PNP, -20 to 60°C operating temperature |
| 45MR-1600-T | Module for the ioThinX 4500 Series, 16 DIs, 24 VDC, PNP, -40 to 75°C operating temperature |
| 45MR-1601 | Module for the ioThinX 4500 Series, 16 DIs, 24 VDC, NPN, -20 to 60°C operating temperature |
| 45MR-1601-T | Module for the ioThinX 4500 Series, 16 DIs, 24 VDC, NPN, -40 to 75°C operating temperature |
| 45MR-2404 | Module for the ioThinX 4500 Series, 4 relays, form A, -20 to 60°C operating temperature |
| 45MR-2404-T | Module for the ioThinX 4500 Series, 4 relays, form A, -40 to 75°C operating temperature |
| 45MR-2600 | Module for the ioThinX 4500 Series, 16 DOs, 24 VDC, sink, -20 to 60°C operating temperature |
| 45MR-2600-T | Module for the ioThinX 4500 Series, 16 DOs, 24 VDC, sink, -40 to 75°C operating temperature |
| 45MR-2601 | Module for the ioThinX 4500 Series, 16 DOs, 24 VDC, source, -20 to 60°C operating temperature |
| 45MR-2601-T | Module for the ioThinX 4500 Series, 16 DOs, 24 VDC, source, -40 to 75°C operating temperature |
| 45MR-2606 | Module for the ioThinX 4500 Series, 8 DIs, 24 VDC, PNP, 8 DOs, 24 VDC, source, -20 to 60°C operating temperature |
| 45MR-2606-T | Module for the ioThinX 4500 Series, 8 DIs, 24 VDC, PNP, 8 DOs, 24 VDC, source, -40 to 75°C operating temperature |
| 45MR-3800 | Module for the ioThinX 4500 Series, 8 AIs, 0 to 20 mA or 4 to 20 mA, -20 to 60°C operating temperature |
| 45MR-3800-T | Module for the ioThinX 4500 Series, 8 AIs, 0 to 20 mA or 4 to 20 mA, -40 to 75°C operating temperature |
| 45MR-3810 | Module for the ioThinX 4500 Series, 8 AIs, -10 to 10 V or 0 to 10 V, -20 to 60°C operating temperature |
| 45MR-3810-T | Module for the ioThinX 4500 Series, 8 AIs, -10 to 10 V or 0 to 10 V, -40 to 75°C operating temperature |
| 45MR-4420 | Module for the ioThinX 4500 Series, 4 AOs, 0 to 10 V or 0 to 20 mA or 4 to 20 mA, -20 to 60°C operating temperature |

| | |
|-------------|---|
| 45MR-4420-T | Module for the ioThinX 4500 Series, 4 AOs, 0 to 10 V or 0 to 20 mA or 4 to 20 mA, -40 to 75°C operating temperature |
| 45MR-6600 | Module for the ioThinX 4500 Series, 6 RTDs, -20 to 60°C operating temperature |
| 45MR-6600-T | Module for the ioThinX 4500 Series, 6 RTDs, -40 to 75°C operating temperature |
| 45MR-6810 | Module for the ioThinX 4500 Series, 8 TCs, -20 to 60°C operating temperature |
| 45MR-6810-T | Module for the ioThinX 4500 Series, 8 TCs, -40 to 75°C operating temperature |

Power Modules

| | |
|-------------|--|
| 45MR-7210 | Module for the ioThinX 4500 Series, system and field power inputs, -20 to 60°C operating temperature |
| 45MR-7210-T | Module for the ioThinX 4500 Series, system and field power inputs, -40 to 75°C operating temperature |
| 45MR-7820 | Module for the ioThinX 4500 Series, potential distributor module, -20 to 60°C operating temperature |
| 45MR-7820-T | Module for the ioThinX 4500 Series, potential distributor module, -40 to 75°C operating temperature |

© Moxa Inc. All rights reserved. Updated Oct 29, 2019.

This document and any portion thereof may not be reproduced or used in any manner whatsoever without the express written permission of Moxa Inc. Product specifications subject to change without notice. Visit our website for the most up-to-date product information.