ioPAC 5542 Series

Rugged, compact RTU controllers

- Dedicated ARM CPUs for both the main system and I/O channels
- Millisecond timestamp granularity on both digital input and analog input
- Up to 250 Hz (per channel) sampling rate
- Prerecord feature for analog input data logging
- Supports C/C++ or IEC 61131-3 programming languages
- Compliant with EN 50121-4, UL/cUL Class 1 Division 2
- Robust and compact design for harsh environments

Overview

The ioPAC 5500 standalone controllers use an ARM9 industrial grade CPU for the main system, with ARM Cortex™ M4 based CPUs used for I/O channels. The USB bus between the controller CPU and module CPUs transmits data at up to 200 Mbps, and the dual CPU architecture supports up to a 250 Hz per channel analog input sampling rate with millisecond timestamp granularity. The ioPAC 5500 supports C/C++ programming langauges, rail-level surge and ESD protection, a -40 to 75°C (-30 to 75°C for HSPA models) operating temperature range, UL/cUL Class 1 Division 2 certifications, two 10/100 Mbps Ethernet ports with two MACs (Port Trunking ready), and two 3-in-1 serial ports. With Moxa's Active OPC Server and DA-Center, the ioPAC 5500 series provides a comprehensive solution for data acquisition and control applications in harsh environments.

High Sampling Rate

High sampling rate AI

Moxa's ioPAC 5542 RTUs use an ARM9 industrial-grade CPU, and the dual CPU architecture supports up to 250 Hz/ch analog input sampling rate, giving engineers the analog data precision they need to correctly analyze events, and then formulate the best response.

Prerecorded analog input

Pre-recording

The ioPAC 5542's prerecord function allows the RTU controller to continuously record analog input data before an event trigger point. The prerecording function is a major improvement over products that only start data logging after an event has occurred, which can lead to the loss of critical data due to the latency between the event and when the data logging actually begins.

Millisecond Timestamps

Millisecond timestamp level of accuracy gives engineers a powerfully. For example, if an emergency triggers 10 separate I/O events within a 10-millisecond time interval, you will still be able to clearly identify the sequence in which the events occurred, even if the I/O events are recorded by different modules.

Specifications

Computer

Main CPU: 32-bit ARM9 192 MHz CPU
I/O CPU: 32-bit ARM Cortex M4 80 MHz CPU
OS: Linux
Clock: Real-time clock with battery backup
Memory:
• SDRAM: 64 MB
• Flash: 32 MB
• SRAM: 256 KB (battery backup lasts for 1 week)
• microSD™ Slot: Up to 32 GB (SD 2.0 compatible)
Note: For units operating in extreme temperatures, industrial grade, wide-temperature microSD cards are required.

Cellular (for the ioPAC 5542-HSPA Series)

Network:
• Quad-band GSM/GPRS/EDGE 850/900/1800/1900 MHz
• Five-band UMTS/HSPA+ 800/850/AWS/1900/2100 MHz
Internet:
HSPA:
• Up to 5.76 Mbps upload speed
• Up to 14.4 Mbps download speed
UMTS: Up to 384 kbps upload/download speed
EDGE Class 12: Up to 237 kbps upload/download speed
GPPRS Class 12: Up to 85.6 kbps upload/download speed
SMS: Point-to-Point Text/PDU mode
SIM Control Voltage: 3/1.8 V

Ethernet Interface
LAN: 2 x 10/100 Mbps, 2 MACs (IPs), RJ45
Protection: 1.5 kV magnetic isolation

Serial Communication
Interface:
• 2 RS-232/422/485 ports, software selectable (DB9 male)
• 1 RS-232 debug port (4-pin connector)
Serial Line Protection: 15 kV ESD for all signals

Serial Communication Parameters
Parity: None, Even, Odd
Data Bits: 7, 8
Stop Bits: 1, 2
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 300 bps to 921.6 kbps

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

Inputs and Outputs
Analog Inputs: 8 channels
Digital Inputs: 8 channels
Configurable DIOs: 8 channels
Isolation: 3k VDC or 2k Vrms

Analog Input
Type: Differential Input
Resolution: 16 bits
I/O Mode: Voltage / Current
Input Range: 0 to 10 VDC, -10 to 10 VDC, 0 to 20 mA, 4 to 20 mA (wire off)
Historical Data Buffering: 60KB per channel, 120 second data buffer at 250 Hz
Accuracy:
±0.1% FSR @ 25°C
±0.3% FSR @ -40 and 75°C
Sampling Rate:
• All channels: 2000 samples/sec
• Per channel: 250 samples/sec
Input Impedance: 2M ohms (min.)
Built-in Resistor for Current Input: 120 ohms (min.)

Digital Input
Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI or Event Counter
Dry Contact:
• On: short to GND
• Off: open
Wet Contact:
NPN (DI to GND):
• On: 0 to 3 VDC
• Off: 10 to 30 VDC
PNP (DI to GND):
• Off: 0 to 3 VDC
• On: 10 to 30 VDC
Common Type: 4 points per COM
Counter Frequency: 1 kHz
Digital Filtering Time Interval: Software selectable (by 0.5 ms)

Digital Output
Type: Sink
I/O Mode: DO or Pulse Output
Pulse Output Frequency: 1 kHz
Over-voltage Protection: 45 VDC
Over-current Protection: 2.6 A (4 channels @ 650 mA)
Over-temperature Shutdown: 175°C (typical), 150°C (min.)
Current Rating: 200 mA per channel

Software Characteristics
Automation Languages: C/C++, IEC 61131-3
Protocols: Modbus/TCP, Modbus/RTU Master

Power Requirements
Power Input: 24 VDC nominal, 9 to 48 VDC

Physical Characteristics
Housing: Aluminum
Dimensions: 90.05 x 135 x 105.4 mm (3.55 x 5.32 x 4.15 in)
Weight:
• ioPAC 5542-HSPA Series: 1100 g
• ioPAC 5542 Series: 1000 g
Mounting: DIN-Rail mounting (standard), wall mounting (optional)
Connector: Spring-type terminal block

Environmental Limits
Operating Temperature:
• ioPAC 5542 Series: -40 to 75°C (-40 to 176°F)
• ioPAC 5542-HSPA Series: -30 to 75°C (-22 to 176°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)
Altitude: Up to 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

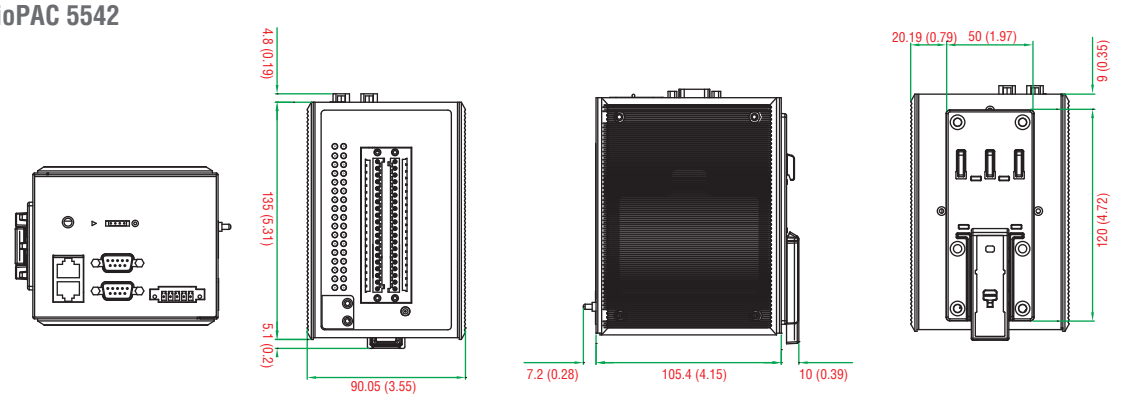
Standards and Certifications
Safety: UL 508, NCC
Hazardous Location: UL/cUL Class 1 Division 2
EMI: EN 55022, EN 61000-3-2, EN 61000-3-3, FCC Part 15 Subpart B Class A
EMS: EN 55024, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11
Shock: IEC 60068-2-27
Freefall: IEC 60068-2-32
Vibration: IEC 60068-2-6
Rail Traffic: EN 50121-4
Note: Please check Moxa's website for the most up-to-date certification status.

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

Dimensions

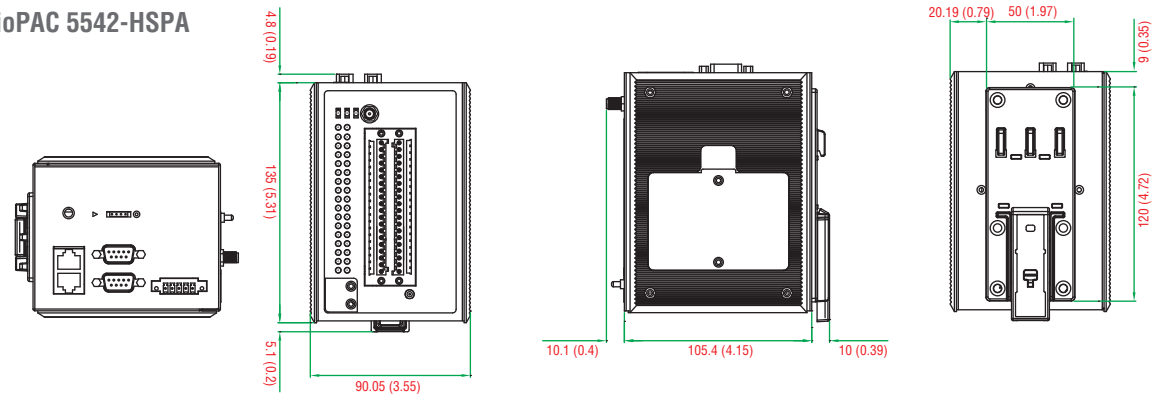
Unit: mm (inch)

ioPAC 5542



Top View | Front View | Side View | Rear View

ioPAC 5542-HSPA



Top View | Front View | Side View | Rear View

Ordering Information

Available Models

ioPAC 5542-C-T: RTU controller, 8AIs, 8 DIs, 8 DI/Os, C/C++, -40 to 75°C operating temperature
ioPAC 5542-IEC-T: RTU controller, 8AIs, 8 DIs, 8 DI/Os, IEC 61131-3, -40 to 75°C operating temperature
ioPAC 5542-HSPA-C-T: RTU controller with HSPA module, 8AIs, 8 DIs, 8 DI/Os, C/C++, -30 to 75°C operating temperature
ioPAC 5542-HSPA-IEC-T: RTU controller with HSPA module, 8AIs, 8 DIs, 8 DI/Os, IEC 61131-3, -30 to 75°C operating temperature

Optional Accessories (can be purchased separately)

WK-51-01: Wallmount kit

Package Checklist

- ioPAC 5500 controller
- Serial console cable
- 3G antenna included in HSPA series package
- Documentation and software CD