# 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 sampling rate per analog input channel
> 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

RoHS · EN 50121 · CE · FC · c UL us LISTED
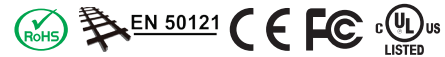
: Overview

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 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++ or IEC 61131-3 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 a 2000 Hz analog input sampling rate (all channels), giving engineers the analog data precision they need to correctly analyze events, and then formulate the best response.

Prerecorded Analog Input

Prerecording

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.

: 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
GPRS 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 Interface
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

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

Digital Input

Sensor Type: Wet Contact (NPN or PNP), Dry Contact
I/O Mode: DI Counter or Frequency
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 PWM
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

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: 60 KB 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: 2 mega-ohms (min.)
Built-in Resistor for Current Input: 120 ohms (min.)

Software Characteristics

Automation Languages: C/C++ or IEC 61131-3
Protocols: Modbus TCP/RTU (master/slave), SNMP TCP/IP, UDP, DHCP, BOOTP, SNTP, SMTP

Power Requirements

Input Voltage: 24 VDC (9 to 48 VDC)
Input Current:
• ioPAC 5542-HSPA series: 305 mA @ 24 VDC
• ioPAC 5542 series: 264 mA @ 24 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 (2.43 lb)
• ioPAC 5542 Series: 1000 g (2.20 lb)
Mounting: DIN rail (standard), wall (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)
Shock: IEC 60068-2-27
Vibration: IEC 60068-2-6
Altitude: 2000 m
Note: Please contact Moxa if you require products guaranteed to function properly at higher altitudes.

Standards and Certifications

Safety: UL 508
EMC: EN 55022/24
EMI: FCC Part 15 Subpart B Class A, CISPR 22
EMS:
IEC 61000-4-2 ESD: Contact: 4 kV; Air: 8 kV
IEC 61000-4-3 RS: 80 MHz to 1000 MHz: 3 V/m
IEC 61000-4-4 EFT: Power: 1 kV; Signal: 0.5 kV
IEC 61000-4-5 Surge: Power: 2 kV (L-PE), 1 kV (L-L); Signal: 1 kV
IEC 61000-4-6 CS: 3 V
IEC 61000-4-8 PFMF: 1 A/m
Radio: NCC
Rail Traffic: EN 50121-4
Hazardous Location: Class 1 Division 2
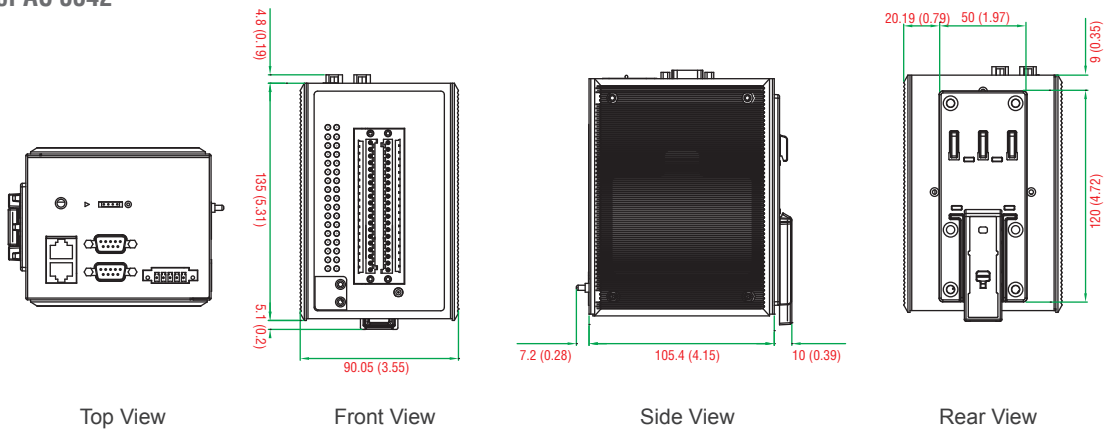Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

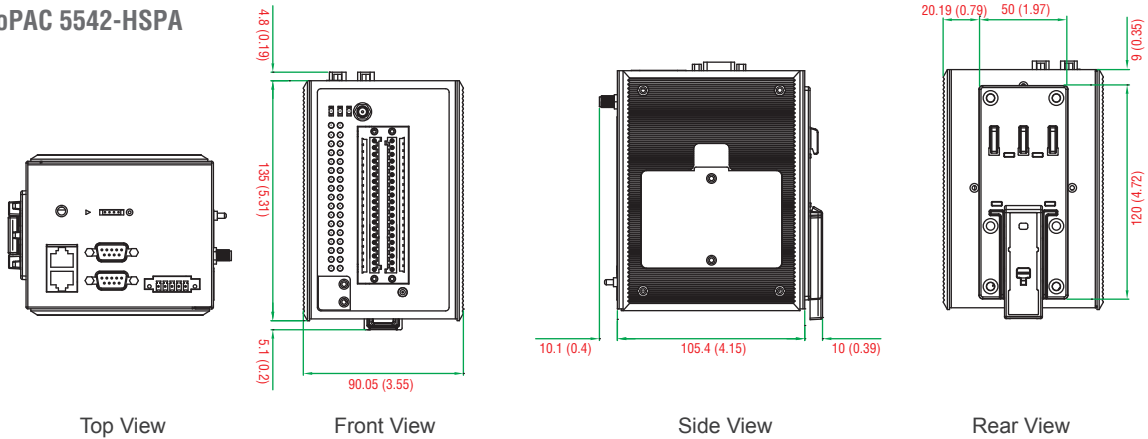**Warranty Period:** 5 years
Details: See www.moxa.com/warranty

Dimensions

Unit: mm (inch)

ioPAC 5542

Top View | Front View | Side View | Rear View

4.8 (0.19) • 135 (5.31) • 5.1 (0.2) • 90.05 (3.55) • 7.2 (0.28) • 105.4 (4.15) • 10 (0.39) • 20.19 (0.79) • 50 (1.97) • 9 (0.35) • 120 (4.72)

ioPAC 5542-HSPA

Top View | Front View | Side View | Rear View

4.8 (0.19) • 135 (5.31) • 5.1 (0.2) • 90.05 (3.55) • 10.1 (0.4) • 105.4 (4.15) • 10 (0.39) • 20.19 (0.79) • 50 (1.97) • 9 (0.35) • 120 (4.72)

⋮ Ordering Information

Available Models

ioPAC 5542-C-T: Rugged, compact, Ethernet, C/C++ programmable controller with 8 DIs, 8 DIOs, 8 AIs, -40 to 75°C operating temperature
ioPAC 5542-IEC-T: Rugged, compact, Ethernet, IEC 61131-3 programmable controller with 8 DIs, 8 DIOs, 8 AIs, -40 to 75°C operating temperature
ioPAC 5542-HSPA-C-T: Rugged, compact, HSPA, C/C++ programmable controller with 8 DIs, 8 DIOs, 8 AIs, -30 to 75°C operating temperature
ioPAC 5542-HSPA-IEC-T: Rugged, compact, HSPA, IEC 61131-3 programmable controller with 8 DIs, 8 DIOs, 8 AIs, -30 to 75°C operating temperature

Optional Accessories (can be purchased separately)

DK-DC50131: DIN-rail mounting kit, 50 x 131 mm
CBL-RJ458P-100: 8-pin RJ45 CAT5 Ethernet cable, 100 cm
CBL-F9DPF1x4-BK-100: Serial console cable
WK-51-01: Wall-mounting kit, 2 plates with 6 screws
ANT-WCDMA-AHSM-04-2.5m Black: 3G cellular antenna

Package Checklist

- ioPAC 5500 controller
- Serial cable: CBL-F9DPF1x4-BK-100
- Cellular 3G antenna: ANT-WCDMA-AHSM-04-2.5m black
- Documentation and software CD