ioPAC 8600 Series (86M) Modules

Rugged modules for the ioPAC 8600 Series

Features and Benefits

- Complies with all EN 50155 mandatory test items[1]
- Complies with EN 50121-4
- Rugged and compact design for harsh environments
- Expand the I/O and communication capabilities of your ioPAC 8600 Series device
- Wide operating temperature range: -40 to 75°C (-40 to 167°F)
- Channel-to-channel isolated digital input and output
- 24 to 110 V DI/O module and universal power input range module
- Supports CAN bus for CAN 2.0 A/B communication

Certifications

EN 50155 EN 50121-4 CE FC

Introduction

Moxa's ioPAC 8600 Series 86M Modules include channel-to-channel isolated DIs, channel-to-channel isolated DOs, relays, and AOs to provide even more I/O options for ioPAC 8600 Series devices. Combined with the 85M modules, users have a wide variety of options to choose from, allowing them to select the I/O combination that best fits their target application. All 86M modules are designed for railway industry applications, and as such, are compliant with EN 50121-3-2, EN 50121-4, and all EN 50155 mandatory test items. In addition, these modules all support a wide operating temperature range of -40 to 75°C for reliable operation even in harsh environments.

Specifications

Input/Output Interface

Digital Input Channels	86M-1620D-T: 16 86M-1832D-T: 8
Digital Output Channels	86M-2821D-T: 8 86M-2830D-T: 8
Relay Channels	86M-2604D-T: 6
Analog Output Channels	86M-4420-T: 4
2-Wire Ethernet Ports	86M-5212U-T: 2
CAN Ports	86M-5250-T: 2
Isolation	3k VDC or 2k Vrms

Digital Inputs

Connector	Spring-type Euroblock terminal
Voltage	86M-1620D-T: 24 to 110 VDC 86M-1832D-T: 24 VDC
Channel-to-Channel Isolation	86M-1832D-T: 1k VDC

1. This product is suitable for rolling stock railway applications, as defined by the EN 50155 standard. For a more detailed statement, click here: www.moxa.com/doc/specs/EN_50155_Compliance.pdf

Counter Frequency	86M-1832D-T: 5k Hz
Debouncing Function	86M-1620D-T: Software enable/disable
Debouncing Time	86M-1620D-T: 1 to 15 ms (software-selectable)
Digital Filtering Time Interval	86M-1832D-T: Software configurable
I/O Mode	86M-1620D-T: DI 86M-1832D-T: DI, event counter, or frequency
Points per COM	86M-1620D-T: 8 channels
Scan on Time	86M-1620D-T: 0.5 ms
Scan Period	86M-1620D-T: 8 ms (typical)
Sensor Type	86M-1620D-T: PNP 86M-1832D-T: Wet Contact (NPN or PNP)
Wet Contact (DI to COM)	86M-1832D-T: On: 10 to 30 VDC 86M-1832D-T: Off: 0 to 3 VDC 86M-1620D-T: On: > 0.3 times external power voltage 86M-1620D-T: Off: < 0.15 times external power voltage

Digital Outputs

Connector	Spring-type Euroblock terminal
Voltage	86M-2830D-T: 24 VDC 86M-2821D-T: 24 to 110 VDC
Current Rating	86M-2821D-T: 1500 mA per channel 86M-2830D-T: 200 mA per channel
I/O Mode	DO or PWM
I/O Type	86M-2821D-T: Source 86M-2830D-T: Sink
Over-Voltage Protection	86M-2821D-T: 160 VDC 86M-2830D-T: 41 VDC
Short-Circuit Protection	86M-2821D-T: 2800 mA @ 25°C 86M-2830D-T: 750 mA @ 25°C
Pulse Output Frequency	86M-2821D-T: 100 Hz 86M-2830D-T: 1 kHz

Relays

Connector	Spring-type Euroblock terminal
I/O Mode	Relay or PWM
Contact Current Rating	Resistive load: 5 A @ 30 VDC, 250 VAC
Contact Resistance	100 milli-ohms (max.)
Electrical Endurance	60,000 operations @ 5 A resistive load
Initial Insulation Resistance	1,000 mega-ohms (min.) @ 500 VDC
Mechanical Endurance	5,000,000 operations
Pulse Output Frequency	0.33 Hz at rated load
Type	Form A (N.O.) power relay

Analog Outputs

Connector	Spring-type Euroblock terminal
I/O Mode	Static or waveform mode
Accuracy	±0.1% FSR @ 25°C ±0.3% FSR @ -40 to 75°C
Current Load Resistance	External 24 VDC power: 1000 ohms Internal power: 400 ohms
Output Range	0 to 10 VDC 0 to 20 mA -10 to 10 V 4 to 20 mA
Resolution	12-bit
Voltage Output	10 mA (max.)
Waveform Frequency	125 Hz
Waveform Type	Sine, Square, Triangle

Ethernet Interface

Connector	M12 D-coded 2-pin female connector
No. of Ports	2
Standards	BroadR-Reach® for 10 Mbps and 100 Mbps IEEE 802.3 for 10BaseT IEEE 802.3u for 100BaseT(X) and 100BaseFX

CAN Interface

Industrial Protocols	CAN 2.0A, CAN 2.0B, CANopen DS301, V4.02
Baudrate	10/20/50/125/250/500/800/1000 kbps, user-defined
Connector	DB9 male
Isolation	3k VDC or 2k Vrms
No. of Ports	2
Terminator	N/A, 120 ohms (by DIP)

Power Parameters

Power Consumption	86M-1620D-T: 12.6 mA @ 24 VDC 86M-1832D-T: 12.6 mA @ 24 VDC 86M-2604D-T: 127 mA @ 24 VDC 86M-2830D-T: 76.7 mA @ 24 VDC 86M-2821D-T: 85.2 mA @ 24 VDC 86M-4420-T: 143.8 mA @ 24 VDC 86M-5212U-T: 79.2 mA @ 24 VDC 86M-5250-T: 60.0 mA @ 24 VDC

Physical Characteristics

Dimensions	25 x 128.2 x 85.5 mm (0.98 x 5.05 x 3.37 in)
Weight	Under 80 g
Wiring	I/O cable, 16 to 28 AWG

Environmental Limits

Operating Temperature	-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	2000 m[2]

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: 6 kV; Air: 8 kV IEC 61000-4-3 RS: 5100 MHz to 6000 MHz: 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: 10 V IEC 61000-4-8 PFMF
Railway	EN 50121-4, EN 50155
Safety	UL 508
Shock	IEC 60068-2-27
Vibration	IEC 60068-2-6

MTBF

Time	86M-1620D-T: 1,115,244 hrs 86M-1832D-T: 1,149,108 hrs 86M-2604D-T: 4,173,843 hrs 86M-2821D-T: 696,245 hrs 86M-2830D-T: 1,766,037 hrs 86M-4420-T: 2,409,345 hrs 86M-5212U-T: 2,498,942 hrs 86M-5250-T: 3,306,609 hrs
Standards	Telcordia SR332

Warranty

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

Package Contents

Device	1 x ioPAC 8600 Series (86M) module
Documentation	1 x warranty card

Ordering Information

Model Name	Input/Output Interface	Input/Output Mode	Type	Channel LED
86M-1620D-T	16 x DI	24-110 VDC	Sink	✓
86M-1832D-T	8 x DI	24 VDC ch-to-ch isolation	Sink/source	✓
86M-2604D-T	6 x Relay	Form A (N.O.)	–	✓
86M-2821D-T	8 x DO	24-110 VDC	Source	✓
86M-2830D-T	8 x DO	24 VDC ch-to-ch isolation	Sink	✓

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

Model Name	Input/Output Interface	Input/Output Mode	Type	Channel LED
86M-4420-T	4 x AO	±10 V 0-10 V 0-20 mA 4-20 mA	–	–
86M-5212U-T	2 x 2-wire Ethernet	100BASE-TX IEEE 802.3u 10BASE-T IEEE 802.3 100 Mbps BroadR-Reach 10 Mbps BroadR-Reach	–	✓
86M-5250-T	2 x CAN	CAN 2.0A CAN 2.0B CANopen DS301, V4.02	–	✓