ioPAC 8500 Series (85M) Modules
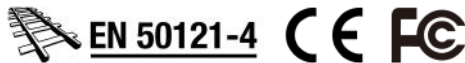
Rugged modules for the ioPAC 8500 Series

Features and Benefits

- Compliant with EN 50121-3-2, EN 50121-4, and a portion of EN 50155 specifications
- Rugged and compact design for harsh environments
- Expand the I/O and communication capabilities of your ioPAC 8600 or 8500 Series device
- Wide operating temperature range: -40 to 75°C (-40 to 167°F)
- Millisecond timestamp granularity for digital input and analog input
- Supports sampling rates up to 40 kHz for analog input
- Pre-recording for analog input data logging
- Up to 4 3-in-1 RS-232/422/485 serial ports

Certifications

EN 50121-4   CE   FC

Introduction

Moxa's ioPAC 8500 Series 85M Modules can be installed in both ioPAC 8500 and ioPAC 8600 Series devices. Modules are available with DI/Os, AIs, Fast AIs, and serial interfaces, giving users a wide variety of options to choose from and allowing them to select the I/O combination that best fits their target application. All 85M modules are designed for railway industry applications, and as such, are compliant with EN 50121-3-2, EN 50121-4, and a portion of the EN 50155 specifications. 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

Analog Input Channels	85M-3800-T/3801-T/3810-T/3811-T: 8
Digital Input Channels	85M-1602-T: 16
Digital Output Channels	85M-2600-T: 16
Isolation	3k VDC or 2k Vrms
RTD Channels	85M-6600-T: 6
Thermocouple Channels	85M-6810-T: 8
Serial Ports	85M-5401-T: 4

Digital Inputs

Voltage	24 VDC
Connector	Spring-type Euroblock terminal
Counter Frequency	5 kHz
Dry Contact	On: short to GND Off: open
I/O Mode	DI, event counter, or frequency

Points per COM	8 channels
Sensor Type	Dry contact Wet Contact (NPN or PNP)
Wet Contact (DI to COM)	On: 10 to 30 VDC Off: 0 to 3 VDC

Digital Outputs

Voltage	24 VDC
Connector	Spring-type Euroblock terminal
Current Rating	200 mA per channel
I/O Mode	DO or PWM
I/O Type	Sink
Over-Current Protection	0.65 A per channel @ 25°C
Over-Temperature Shutdown	175°C (typical), 150°C (min.)
Over-Voltage Protection	35 VDC
Pulse Output Frequency	5 kHz

Analog Inputs

Accuracy	±0.1% FSR @ 25°C ±0.3% FSR @ -40 to 75°C
Built-in Resistor for Current Input	85M-3800-T/3801-T: 125 ohms
Connector	Spring-type Euroblock terminal
Historical Data Buffering	85M-3801-T/3811-T: 60 KB per channel, 6-second data buffer at 5 kHz
I/O Type	Differential
Input Impedance	85M-3800-T/3801-T: 125 ohms (min.) 85M-3810-T: 200 kilo-ohms (min.) 85M-3811-T: 20 mega-ohms (min.)
Input Range	85M-3800-T/3801-T: 4 to 20 mA (with burn-out detection) 85M-3810-T/3811-T: 0 to 10 VDC
Resolution	16 bits
Sampling Rate	85M-3800-T/3810-T: All channels: 100 samples/sec Per channel: 12.5 samples/sec 85M-3801-T/3811-T: All channels: 40k samples/sec Per channel: 5k samples/sec

RTDs

Accuracy	±0.1% FSR @ 25°C ±0.3% FSR @ -40 to 75°C
Connector	Spring-type Euroblock terminal
Input Connection	2- or 3-wire
Input Impedance	625 kilo-ohms (min.)

Sensor Type	JPT100, JPT200, JPT500 (-200 to 640°C)
	JPT1000 (-200 to 350°C)
	NI100, NI50, NI500 (-60 to 250°C)
	NI1000 (-60 to 150°C)
	NI120 (-80 to 260°C)
	PT1000 (-200 to 350°C)
	PT50, PT100, PT200, PT500 (-200 to 850°C)
	Resistance of 310, 620, 1250, and 2200 ohms
Resolution	0.1°C or 0.1 ohms
Sampling Rate	All channels: 12 samples/sec
	Per channel: 2 samples/sec

Thermocouples

Millivolt Accuracy	±0.1% FSR @ 25°C
	±0.3% FSR @ -40 to 75°C
Connector	Spring-type Euroblock terminal
Input Impedance	1 mega-ohms (min.)
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
Sampling Rate	All channels: 12 samples/sec
	Per channel: 1.5 samples/sec
Sensor Type	J, K, T, E, R, S, B, N

Serial Interface

Baudrate	300 bps to 921.6 kbps
Data Bits	7, 8
Flow Control	RTS/CTS, XON/XOFF
Parity	Even, None, Odd
Serial Standards	RS-232/422/485
Stop Bits	1, 2

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

Power Parameters

Power Consumption	85M-1602-T: 50.0 mA @ 24 VDC
	85M-2600-T: 35.4 mA @ 24 VDC
	85M-3800-T: 43.8 mA @ 24 VDC
	85M-3801-T: 43.8 mA @ 24 VDC
	85M-3810-T: 43.3 mA @ 24 VDC
	85M-3811-T: 521 mA @ 24 VDC
	85M-5401-T: 51.7 mA @ 24 VDC
	85M-6600-T: 27.7 mA @ 24 VDC
	85M-6810-T: 24.1 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, 14 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[1]

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	85M-1602-T: 1,132,561 hrs
	85M-2600-T: 792,571 hrs
	85M-3800-T: 1,512,906 hrs
	85M-3801-T: 1,426,112 hrs
	85M-3810-T: 1,530,690 hrs
	85M-3811-T: 1,426,112 hrs
	85M-5401-T: 596,611 hrs
	85M-6600-T: 571,446 hrs
	85M-6810-T: 2,324,891 hrs
Standards	Telcordia SR332

Warranty

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

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

Package Contents

Device	1 x ioPAC 8500 Series (85M) module
Documentation	1 x warranty card

Ordering Information

Model Name	Input/Output Interface	Analog Input Type	Analog Input Sampling Rate	Serial Standards
85M-1602-T	16 x DI	–	–	–
85M-2600-T	16 x DO	–	–	–
85M-3800-T	8 x AI	4-20 mA	Per channel: 12.5 samples/sec	–
85M-3801-T	8 x AI	4-20 mA	Per channel: 5k samples/sec	–
85M-3810-T	8 x AI	0-10 V	Per channel: 12.5 samples/sec	–
85M-3811-T	8 x AI	0-10 V	Per channel: 5k samples/sec	–
85M-5401-T	4 x Serial port	–	–	RS-232/422/485
85M-6600-T	6 x RTD	–	–	–
85M-6810-T	8 x TC	–	–	–

Accessories (sold separately)

Cables

CBL-M44M9x4-50	4-port DB44 male to DB9 male cable, 50 cm Applicable Models: 85M-5401-T