E+PLC400

Eurotherm®

다목적의 정밀 PLC

... 최고의 PID 제어와 레코딩 성능을 가진

E+PLC400 는 놀라울 정도로 쉽게 단일 모듈형 솔루션에 PID제어, 레코딩과 PLC 를 통합 하였습니다. 프로그래밍과 작화가 통합된 단일의 산업 표준 (IEC 61131-3) 플 랫폼을 사용합니다. 이 혁신적인 기기는 엔지니어링 시간을 줄이면서 프로세스 용구 에 맞도록 유연성을 제공 하도록 설계 되었습니다. 이 것은 운영 효율성, 더 나은 공 정성능과 쉬운 규정 준수를 제공하기 위해 풍부한 기능과 향상된 사용자환경입니다.

E+PLC400 는 빠르게 엔지니어링 할 수 있도록 Eurotherm 고유의 제어와 레코딩 기능을 가진 펑션블럭과 모든 PLC 의 기능을 결합 하였습니다. 이것은 베이스 크기 를 선택 할 수 있고, 현재 또는 미래의 요구에 대응하도록 확장이 가능 하며, 다양한 목적의 정밀 I/O를 제공 합니다.

E+PLC400은 사용의 용이성을 보장하는 IEC 61131-3 의 언어들을 사용하에 친숙 한 프로그래밍 환경을 제공하는 선도적인 CODESYS 플랫폼을 사용 합니다, 쉽고 유 연한 작화가 최대 두개의 로칼 오퍼레이션 페널뿐 아니라 PC, 태블릿, 스마트폰 과 같 은 모바일 기기에서 사용 할 수 있는 웹서버로 제공됩니다; PLC와 같은 환경에서 자 동 태그 인식으로 빠르게 설정 할 수 있습니다.

- **쉽게 제어와 레코닝을 하는 오픈 PLC**
  - 단일 프로그램 도구의 확장가능 한모듈형 솔 루션
  - 표준 IEC 61131-3 프로그래밍
  - PLC, PID 제어, 레코딩과 작화를 제공하는 단 일 CODESYS 통합개발환경
  - 빠른 엔지니어링을 위해 미리 검증 받은 펑션 블럭
- **PLC 에서 정밀 PID 제어**
  - 정밀하고 안정적인 제어 성능
  - 공정 시간의 감소
  - 생산성 증가
  - 에너지 사용 최적화
  - 품질 향상
  - 스크랩/재작업 최소화
- **PLC에서 보안 레코딩**
  - 손쉽게 규정 준수
  - 프로세스 변수의 정밀 측정
  - 측정지점에서 안전한 데이더 레코딩
  - 완전하고 정확한 기록의 추적
- **작화를 통합한 PLC**
  - CODESYS확경에 통합된 작화 프로그램
  - 최대 두개의 로컬 저작 패널을 통한 직관적인 프로세스 인터페이스
  - 스마트폰, PC, 태블릿에서 이동중 볼 수 있음

모듈형의 유연한 통합 솔루션

WATLOW®
Powered by Possibility

귀하의 프로세스 퍼즐의 모든 조각에 확장성과 다양한 기능을 추가

정밀한 측정

정밀한 제어를 위해서는 측정값이 정밀해야 합니다.
E+PLC400은정확한 제어와 레코딩의 결합을 가능 하게 하는 다양한 정밀 I/O 를 선택 할 수 있는 모듈형 제품 입니다. 사용자 요구에 맞게 베이스를 선택하고 아나로 그와 디지탈I/O, 릴레이출력과 지르코니아 입력등을 선 택 할 수 있습니다. 높은 성능의 I/O는 엄격한 제어및 프로세스의 정확한 레코딩을 위한 정밀한 측정을 제공 합니다.

중소 규모의 어플리케이션을 위한 다양한 솔루션

최고의 제어

E+PLC400 는 뛰어난 성능을 자랑하는 유로썸 고유의 오토튜닝 PID 알고리즘을 포함한 50 년이상의 제어지 식이 통합되어 있습니다.

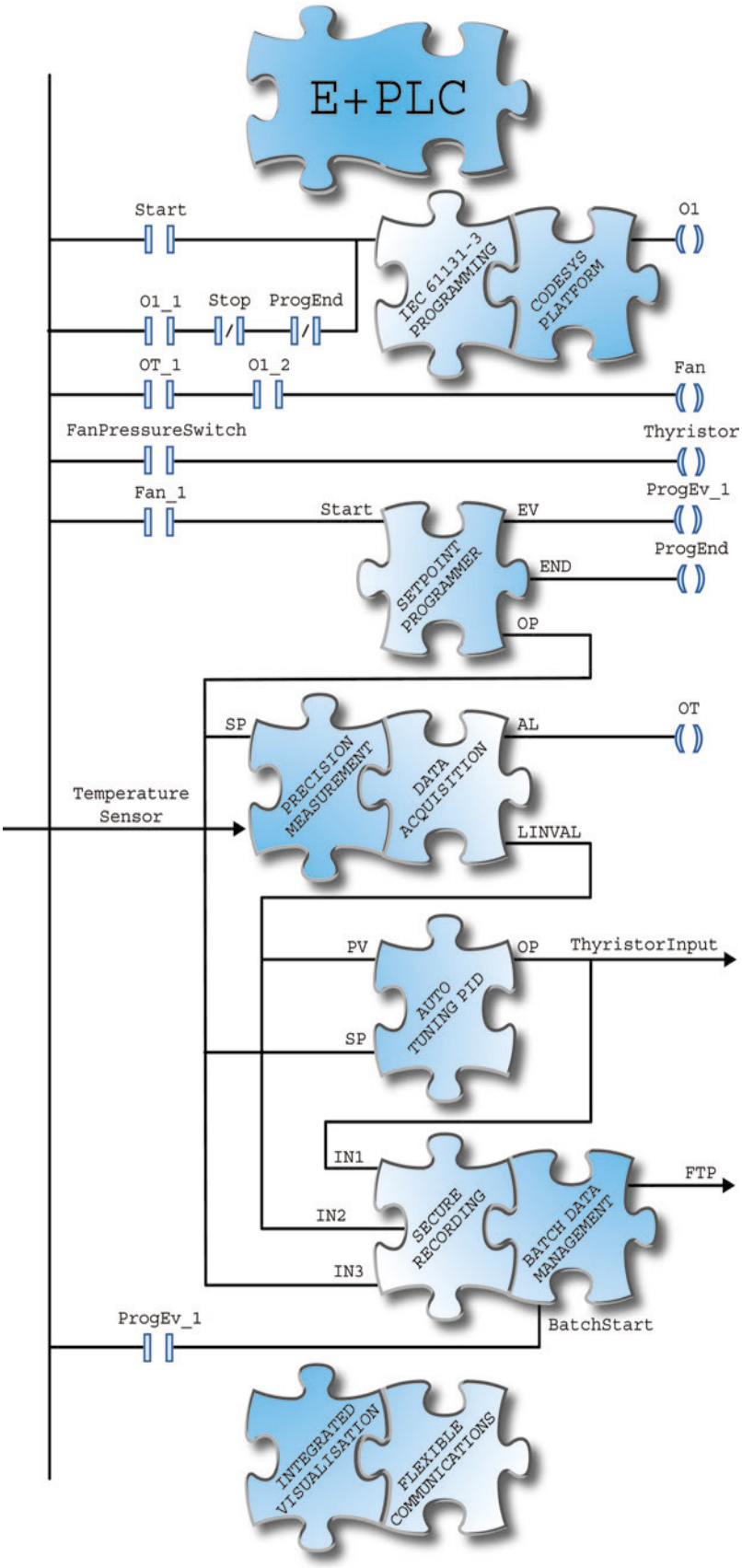
- 빠르게 설정값에 도달하여 공정시간을 단축
- 빠른 제어 응답으로 오버슈트와 언더슈트를 제거하 여 에너지사용을 최적화
- 제어 오차를 줄이고, 안정적인 제어를 통해 품질을 향상
- 파라메터입력만필요한사전엔지니어링펑션블럭

비용 절약, 뛰어난 제어 성능 – 왜 타협해야 하지요?

쉬운 SP 프로그래밍

E+PLC400 는 매우 유연하고 풍부한 기능의 SP 프로그 램을 포함 합니다. 빠르고 쉬운 레시피 설정과 요율적인 운영을 할 수 있도록 스프레드 쉬트 스타일의 포맷을 사용하여 여러개의 세그먼트를 가진 여러개의 프로그램 을 사용할 수 있습니다.

처리 비용을 절감 할 수 있는 보장된 동작



최고의 레코딩

E+PLC400 는 데이터 전체의 무결성과 보안을 보장하기 위해 매우 효율적인 뱃치 데이터 관리 전략과 레코딩 역 량을 통합 하였습니다. 수십년간의 규제과 품질규정의 준 수여부를 확인 하기위해 특별히 사용된 레코딩경험으로 어떠한 염려도 종식시켜 줍니다:

- 측정 시점에서의 지속적인 보안 기록
- 완벽한 데이터 무결성을 위한 전원 및 네트워크 장애 에 대응 전략
- 모든 프로세스 데이터와 메타 데이터를 안전하게 함께 저장함으로 완전한 기록/뱃치 추적
- 로컬 USB, FTP 서버와 Eurotherm 의 혁신적인 온라인 서비스 툴
- 자기 복구, 완전 검증된 데이터의 보관 전략
- 펑션블록 형태로 파라메터 설정만으로 제공되는 보안 레코딩과 뱃치 데이터 관리

완전히 안전한 프로세스 기록의 효율적 데이터 관리

엔지니어링 절감

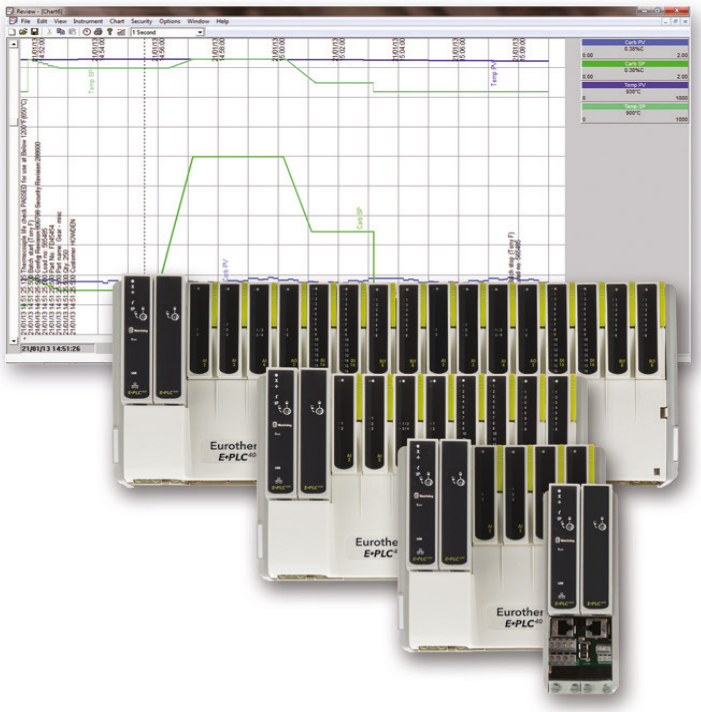
E+PLC400 은 친숙한 개발환경과 엔지니어링 비용을 절감 해주는 CODESYS 플랫폼을 사용 합니다. 단일 통합 개발환경으로 완정한 솔루 션을 만들 수 있습니다. 첨단의 Eurotherm PID 제어와 레코딩 능력을 담 은 사용하기 쉬운 펑션블럭과 그레픽요소가 통합되어 설계되어 있습니다. E+PLC400 은 빠른 엔지니어링과 다양한 어플리케이션을 가진 귀하의 프 로세스에 완벽하고 고성능의 PLC 솔루션을 제공합니다.

개발기간을 줄일 수 있는 프로그래밍 도구는 다음과

같습니다:

- 사용하기 쉬운 펑션불럭의 다양한 기능
  - 오토튜닝PID제어
  - 보안 레코딩
  - SP 프로그래머
  - 뱃치 데이터 관린
  - 지르코니아 프로브 입력
- 포괄적인 PLC 펑션블록 라이브러리 내장
- PLC, PID 제어, 레코딩과 작화를 포함한 완전한 프로세스 솔루션을 위한 단일, 통합 개발 환경

완벽하고 고성능의 PLC 솔루션 만들기 더 이상 쉬울 수 없습니다



E+PLC400 표준 IEC 61131-3 프로그램 언어 사용

Continuous Function Chart (CFC)
Function Block Diagram (FBD)
Instruction List (IL)
Ladder Diagram (LD)
Sequential Function Chart (SFC)
Structured Text (ST)
작화 내장

CODESYS

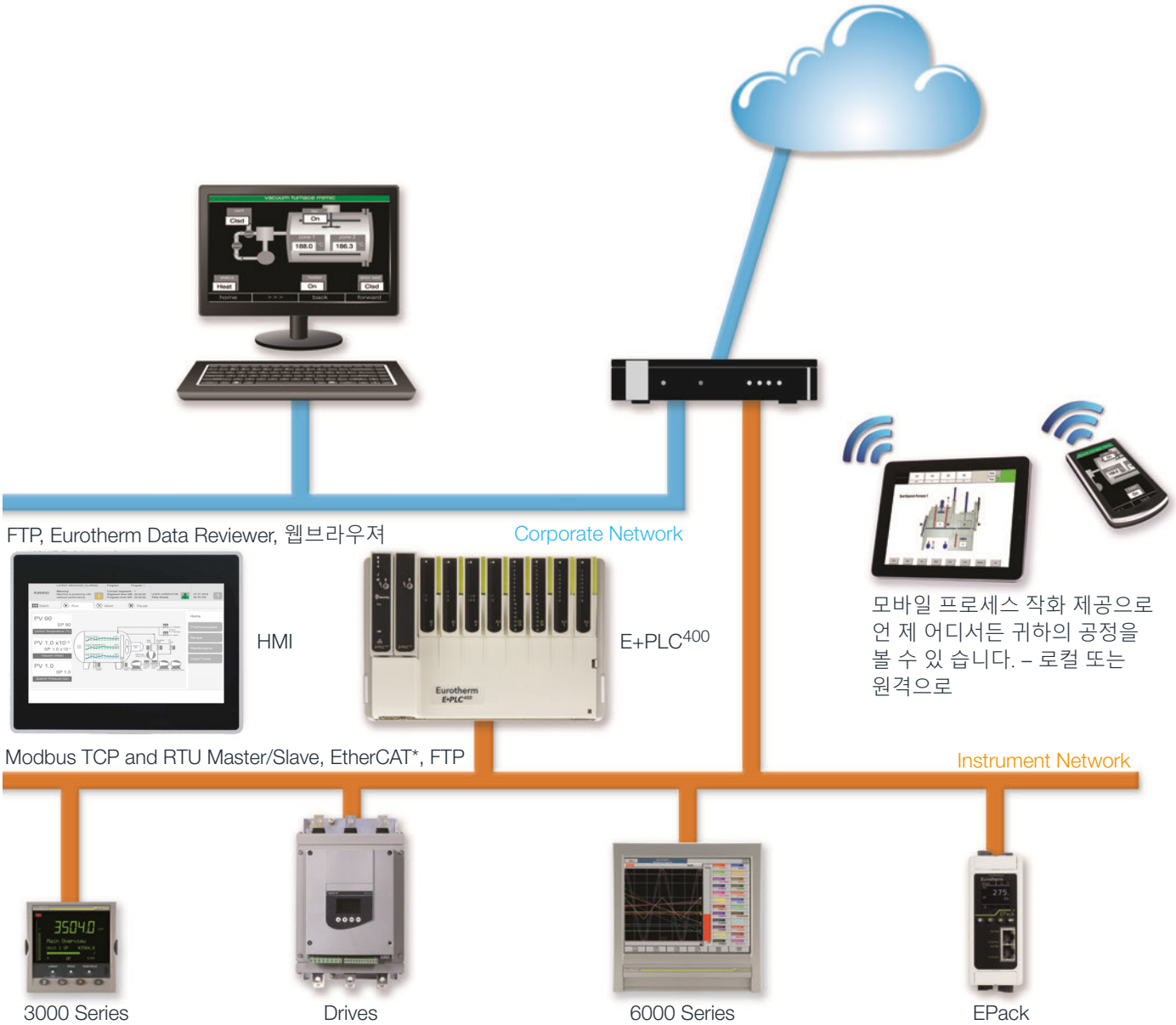
Runtime

Visualization

Fieldbus

쉬운 시스템 통합과 효율적인 프로세스 관리

E+PLC^{400} 은 내장 모드버스TCP 마스터/슬레이브, *EtherCAT 슬레이브 통신으로 상위 시스템에 쉽게 통합 할 수 있도록 설계되어 있습니다. 이로 슬레이브 기기로부터 데이터를 레코딩 하고 전력제어기나 다른 시스템 구성 요소들과 쉽게 결합할 수 있습 니다.



* 공장에 가능 여부를 확인 하세요

E+PLC400 Specification

Base Unit

General

The base unit is fitted with the E+PLC400 processor module plus additional I/O modules. These modules plug onto terminal units, which provide the wiring interface between the plant or machine and the I/O modules. Bases are available in 4 sizes to suit the number of modules required in a particular system.

Communication between the I/O modules and the processor is effected by the use of a passive internal module I/O bus running along the width of the base.

Each module position is tracked separately for additional security during live replacement of I/O modules.

The base consists of an aluminium extrusion, the internal I/O bus and mounting supports. It is designed to be DIN rail mounted or directly fixed to a bulkhead or mounting plate.

Mechanical

Based on the number of modules and allowing for future expansion, the E+PLC400 can be supplied in a range of standard base sizes to suit process requirements. The dimensions and weights of the different base sizes are detailed in the table below:

Module Capacity (Base Size)	0	4	8	16
Weight (no modules) kg	0.2	0.7	1.0	1.6
Weight (all modules) kg	0.7	1.65	3.1	5.3

Mounting:	DIN rail or Bulkhead, mounted vertically
DIN rail:	Use symmetrical DIN rail to EN50022 (35 x 7.5 or 35 x 15)
Casing:	Without additional protection IP20
Ventilation space:	25mm free space above and below

Controller General

Supply voltage range:	24V dc ± 20%
Power consumption:	< 82W maximum for fully loaded rack
Fuse rating:	0.5A time lag (Not customer replaceable)
Surge current:	8A maximum
Module power consumption:	See individual module specification

Environmental

Operating temperature:	0 to 55°C
Storage temperature:	–25°C to 85°C
Relative humidity:	5 to 95% (non-condensing)

Approvals and compliance

RoHS:	EU; China
GOST:	GOST CUTR
CCC:	Exempt
Packaging:	BS61131-2: 2007 section 6.3.3/6.3.4
Shock/Vibration:	To BS EN61131-2 : section 4.2.1 (5 to 150 Hz. at 1g; 0.5 octave per min.)
Altitude:	<2000 metres

RFI

EMC emissions:	BS EN61326 – 1: 2006 Class A
EMC immunity:	BS EN61326 – 1: 2006 Industrial Locations

Safety

BS EN61010-1:2010
Installation cat II, Pollution degree 2
Safety earth and screen connections are made to earth terminals at the bottom of the base
CE and cUL

Diagnostic LEDs

Diagnostic LEDs indicate module diagnostic status.

All modules:	A green LED at the top indicates the module is powered and operating correctly
Analogue modules:	Red LEDs for each channel to indicate channel failure
Digital modules:	Yellow LEDs for each channel to indicate the channel state

Processor Module

Processor and communications diagnostics are available from the LEDs on the front of the processor module. More advanced diagnostics are available remotely using the CODESYS function blocks.

Controller module:	A green LED at the top indicates the module is powered and operating correctly
Internal diagnostics:	A red LED indicates failure of the internal self diagnostic routines or an abnormal operating state.
Battery (if installed):	A green LED indicates battery health
Serial communications:	A yellow LED indicates communications activity
IP address:	A yellow LED indicates if the unit has resolved itIP address for Ethernet communications
Run:	A green LED indicates a program is loaded and running
USB link:	A green LED indicate USB activity, periodic flashing shows an error
USB over-current indication:	A yellow LED indicates an over current error
Ethernet link:	A yellow LED indicate Ethernet link and flashes to show activity
Ethernet Link speed:	A green LED indicates 100Mbs operation

Power on Self Tests: On power up the E+PLC400 automatically performs Power On Self Tests. These are a series of diagnostic tests used to assess the instrument health. The above LEDs indicate module diagnostic status in case of a problem.

Removable SD Memory Card

The storage of the processor firmware, and application is stored on a secure SDHC card this enables easy transfer from one processor to a replacement.

Physical

CPU:	Freescale Power QUICC II Pro processor MPC8313 Bus Size: 32 bit
System Clock:	333 MHz
Logging Capacity:	96MB on board, Log files transferred by FTP or USB
Removable SDHC Card Size:	32 Mbytes
USB:	USB 2.0 connected on terminal unit
Memory Resources	76MB Application/Visualisation files 106MB Data Recording 2MB Retain/Persistant Control Switches:
Processor front panel Push Button Switches:	Watchdog reset

Watchdog Relays

Each processor is fitted with a single watchdog relay.

Watchdog relay:	SPST, 1 per CPU, connected on the terminal unit
Contact rating (resistive):	24V ac/dc at 0.5A
Isolation:	30V ac rms or 60V dc

Communications

Ethernet

Supports 10/100baseT Ethernet:	Modbus-TCP Master or Slave, EtherCAT*
Connectors:	RJ45 connector
Network medium:	Ethernet Cat5 shielded cables
Speed:	10/100baseT auto-select
Line length (maximum):	100 metres, extendible by repeater
Allocation of IP address:	Fixed, DHCP
Modbus:	TCP configurable master or slave
Max numbers of slaves:	16 Modbus TCP slaves
Isolation:	50V dc; 30V ac (IEEE802.3)

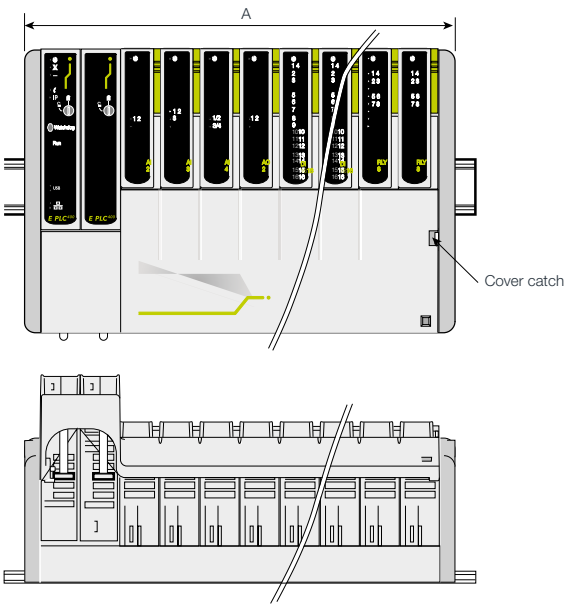
RS422/485 Serial Communications

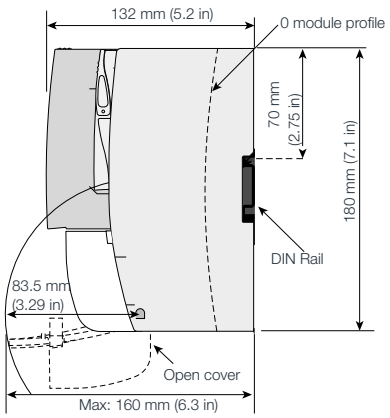
Connector:	RJ45 connector
Comms medium:	RS422 (5-wire) or RS485 (3-wire), jumper select
Line impedance:	120Ω-240Ω twisted pair
Line length:	1220m maximum at 9600 bits/sec
Max number of slaves:	16 Modbus RTU Slaves
Protocol:	Modbus RTU configurable master or slave

Note: Use of a communications buffer/isolator is recommended

Mechanical details

Base Size	A mm (inches)
0 module	61.25 (2.41)
4 module	162.75 (6.41)
8 module	274 (10.8)
16 module	477 (18.8)





Input/Output Modules

Code	Description	Page
AI2-DC	Two Channel Analogue Input	7
AI2-TC	Two Channel Analogue Input	7
AI2-MA	Two Channel Analogue Input	8
AI3	Three Channel Analogue Input	8
AI4-TC	Four Channel Analogue Input	8
AI4-MA	Four Channel Analogue Input	9
AI4-MV	Four Channel Analogue Input	9
AI8-RT	Eight Channel Analogue Input*	9
AI8-TC	Eight Channel Analogue Input*	10
AI8-MA	Eight Channel Analogue Input	10
AI8-FMA	Eight Channel Analogue Input*	10
AO2	Two Channel Analogue Output	11
DI6	Six Channel Digital Input	11
DI16	Sixteen Channel Digital Input	12
DO16	Sixteen Channel Digital Output	12
RLY8	Eight Channel Relay Output	13
ZI	Zirconia Input*	13

AI2 -DC–Two Channel Analogue Input

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. With the DC terminal unit it is optimised for mV, V, RTD or resistive sensors and Pot position sensing applications, for for use with a Zirconia probe (often associated with a temperature measurement) for oxygen measurements.

Module type:	AI2-DC
No of channels:	2
Input types:	mV, V, RTD, Resistance, Potentiometer, Pyrometer
mV input range:	–150mV to +150mV
Initial accuracy:	Better than 0.1% of reading ± 10uV
Resolution:	Better than 2uV
Voltage input range:	–10.3V to +10.3V
Initial accuracy:	Better than 0.1% of reading ± 2mV
Resolution:	Better than 0.2mV
RTD/Ohms input range:	5Ω to 640Ω, supporting 2-, 3- or 4-wire sensor connection
Initial accuracy:	Better than 0.1% of reading ± 0.1Ω
Resolution:	Better than 0.02Ω
RTD/HiOhms input range:	5Ω to 6kΩ, supporting 2-, 3- or 4-wire sensor connection
Initial accuracy:	Better than 0.1% of reading ± 0.5Ω
Resolution:	Better than 0.2Ω
Potentiometer input range:	0% to 100% rotation positioning of 100Ω to 7kΩ linear pot
Initial accuracy:	Better than 0.1% of reading ± 0.1%
Resolution:	Better than 0.001%
Power consumption:	2W maximum
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	50V RMS or dc (basic insulation)
Common mode rejection:	>120dB (47-63Hz)
Series mode rejection:	>60dB (47-63Hz)

Input specification

RTD LIN Types:	See Table 2

Note: User calibration options can improve performance, limited only by noise and non-linearity.

AI2-TC –Two Channel Analogue Input

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. With the TC terminal unit it is optimised for mV and thermocouple applications. It also supports a special high-impedance input on channel 2.

Module type:	AI2-TC
No of channels:	2
Input types:	TC, mV, Pyrometer, Zirconia probe
mV input range:	–150mV to +150mV
Initial accuracy:	Better than 0.1% of reading ± 10uV
Resolution:	Better than 2uV
Zirconia probe input range:	0.0V to +1.8V
Initial accuracy:	Better than 0.1% of reading ± 20uV
Resolution:	Better than 7uV
Power consumption:	2W maximum
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)
Common mode rejection:	>120dB (47Hz to 63Hz)
Series mode rejection:	>60dB (47Hz to 63Hz)

Input specification

TC Linearisation types:	See Table 1
CJC system:	Temperature measured by sensor under the TU input connector
Initial CJC accuracy:	±0.5°C typical (±1°C maximum)
CJC rejection:	Better than 30:1 over operating temperature range

Note: User calibration options can improve performance, limited only by noise and non-linearity.

The total worst-case TC error bound is the sum of the mV signal error, plus CJC error, plus linearisation table error terms.

AI2-MA –Two Channel Analogue Input

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. With the DC-MA terminal unit it is optimised for 4-20mA current loop applications.

Module type:	AI2-MA
No of channels:	2
Input types:	mA
mA Input range:	–28mA to +28mA with 5Ω burden in the Terminal Unit
Initial accuracy:	Better than 0.25% of reading ± 2uA
Resolution:	Better than 0.5uA
Power consumption:	2W maximum
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)
Common mode rejection:	>120dB (47-63Hz)
Series mode rejection:	>60dB (47-63Hz)

Note: User calibration options can improve performance, limited only by noise and non-linearity.

AI3 –Three Channel Analogue Input

This analogue input module is dedicated to current loop applications with modern transmitters. Each isolated channel includes a loop power supply for the transmitter (if needed). The power supply includes overload protection and automatic reset (when the fault is cleared).

Module type:	AI3
No of channels:	3
mA Input range:	–28mA to +28mA
Initial accuracy:	Better than 0.1% of reading ± 2uA
Resolution:	Better than 0.5uA
Loop burden resistance:	60Ω nominal, 50mA maximum current
Channel PSU:	20-26V dc, current limit 30mA nominal, self-resetting
Power consumption:	Current input mode: <2W; with 3 powered loops: <3.3W
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	50V RMS or dc (basic insulation)
Common mode rejection:	>120dB (47-63Hz)
Series mode rejection:	>60dB (47-63Hz)

Notes:

1. User calibration options can improve performance, limited only by noise and non-linearity.

2. Total burden can be increased to 250Ω by cutting a link track on the terminal unit.

AI4-TC –Four Channel Analogue Input

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. With the TC terminal unit it is optimised for mV and thermocouple applications.

Module type:	AI4-TC
No of channels:	4
Input types:	TC, mV, Pyrometer
mV input range:	–150 to +150mV
Initial accuracy:	Better than 0.1% of reading ± 10uV
Resolution:	Better than 2µV
Power consumption:	2W maximum
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation), CH1+CH2 to CH3+CH4
Common mode rejection:	>120dB (47-63Hz)
Series mode rejection:	>60dB (47-63Hz)

Input specification

TC Linearisation types:	See Table 1
CJC system:	Temperature measured by sensor under the TU input connector
Initial CJC accuracy:	±0.5°C typical (±1°C maximum)
CJC rejection:	Better than 30:1 over operating temperature range

The total worst-case TC error bound is the sum of the mV signal error, plus CJC error, plus linearisation table error terms.

Notes:

1. User calibration options can improve performance, limited only by noise and non-linearity.

2. Wiring care and sensor choice should be used to prevent ground loops when using non-isolated thermocouples.

AI4-MA –Four Channel Analogue Input

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. With the MA terminal unit it is optimised for 4-20mA current loop applications.

Module type:	AI4-MA
No of channels:	4
Input types:	mA
mA input range:	–28 to +28mA with 5Ω burden in the terminal unit
Initial accuracy:	Better than 0.25% of reading ± 2uA
Resolution:	Better than 0.5uA
Power consumption:	2W maximum
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation), CH1+CH2 to CH3+CH4
Common mode rejection:	>120dB (47-63Hz)
Series mode rejection:	>60dB (47-63Hz)

Notes:

1. User calibration options can improve performance, limited only by noise and non-linearity.

2. Wiring care and sensor choice should be used to prevent ground loops when using non-isolated thermocouples.

AI4-MV–Four Channel Analogue Input

This analogue input module is used to monitor analogue signals from a wide range of plant sensors.

Module type:	AI4-MV
No of channels:	4
Input types:	mV, Pyrometer, Zirconia Probe
mV input range:	–150mV to +150mV
Initial accuracy:	Better than 0.1% of reading ± 10uV
Resolution:	Better than 2uV
Power consumption:	2W maximum
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation), CH1+CH2 to CH3+CH4
Common mode rejection:	>120dB (47-63Hz)
Series mode rejection:	>60dB (47-63Hz)

Notes:

1. User calibration options can improve performance, limited only by noise and non-linearity.

2. Wiring care and sensor choice should be used to prevent ground loops when using non-isolated thermocouples.

AI8-RT –Eight Channel Analogue Input (consult factory for availability)

This analogue input module is used to monitor resistant thermometer signals from plant sensors. The RTD inputs each require the appropriate terminal unit.

Module type:	AI8-RT
No of channels:	8
Input types:	RTD
RTD support:	Support for 2 and 3-wire resistance thermometer devices
Ohms range:	20Ω to 500Ω and 2 and 3-wire lead compensation
Hi Ohms range:	200Ω to 5KΩ 2 and 3-wire-wire lead compensation
Resolution:	±10mΩ and ±100mΩ (with 0.4s filter)
Linearity:	20ppm of span
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation) Galvanic Isolated in pairs
Series mode rejection:	60dB (47-63Hz)
Common mode rejection:	120dB (47-63kHz) >120dB @50/60Hz
Power consumption:	1.8W maximum

Input specification

RTD LIN Types:	See Table 2

AI8-TC –Eight Channel Analogue Input (consult factory for availability)

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. The mV and TC inputs each require the appropriate terminal unit.

Module type:	AI8-TC
No of channels:	8
Input types:	TC, mV
mV range:	–80mV to +80mV at input impedance >100KΩ
Resolution:	±10mΩ and ±100mΩ (with 0.4s filter)
Linearity:	20ppm of span
Power consumption:	1.8W maximum
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation) Galvanic Isolated in pairs
Common mode rejection:	120dB (47-63kHz) >120dB @50/60Hz
Series mode rejection:	60dB (47-63Hz)

Input specification

TC Linearisation types:	See Table 1
CJC system:	Measured by 2 RTD (Pt100), located beneath the input connector
Initial CJC accuracy:	±0.8°C –sensed with two PT100 sensors on TU
CJC rejection:	Better than 30:1 over 0°C to +55°C ambient

AI8-MA –Eight Channel Analogue Input (consult factory for availability)

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. The mA inputs require the appropriate terminal unit.

Module type:	AI8-MA
No of channels:	8
Input types:	mA
mA range:	–20mA to +20mA with 3.3Ω burden in the terminal unit
Resolution:	±10mΩ and ±100mΩ (with 0.4s filter)
Linearity:	20ppm of span
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation) Galvanic Isolated in pairs
Series mode rejection:	60dB (47-63Hz)
Common mode rejection:	120dB (47-63kHz) >120dB @50/60Hz
Power consumption:	1.8W maximum

AI8-FMA –Eight Channel Analogue Input (consult factory for availability)

This analogue input module is used to monitor analogue signals from a wide range of plant sensors. The mA inputs each require the appropriate terminal unit.

Module type:	AI8-FMA
No of channels:	8
Input types:	mA
mA range:	–20mA to +20mA with 3.3Ω burden in the terminal unit
Resolution:	±10mΩ and ±100mΩ (with 0.4s filter)
Linearity:	20ppm of span
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation) Galvanic Isolated in pairs
Series mode rejection:	60dB (47-63Hz)
Common mode rejection:	120dB (47-63kHz) >120dB @50/60Hz
Power consumption:	1.8W maximum

AO2 –Two Channel Analogue Output

This analogue output module provides two isolated analogue output channels. Each output can be independently configured for current or voltage.

Module type:	AO2
No of channels:	2
Current output:	–0.1 to 20.5mA; 10V dc max. Compliance with total burden less than 500Ω
Resolution:	Better than 1 part in 10,000 (1uA typical)
Voltage output:	–0.1V to 10.1V dc; 20mA max. compliance with total load greater than 550Ω –0.3 to 10.3V dc; 8mA max. compliance with total load greater than 1500Ω
Resolution:	Better than 1 part in 10,000 (0.5mV typical)
System isolation:	300V RMS or dc (double isolation)
Channel isolation:	300V RMS or dc (basic isolation)
Power consumption:	2.2W maximum
Calibration accuracy:	Better than 0.1% of reading

DI6 –Six Channel Digital Input

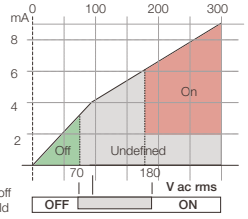
The six channel digital input module accepts AC voltage inputs and is available in two factory options optimized for 115V ac or 230V ac ranges.

Module type:	DI6-115, DI6-230
No of channels:	6
Input functions:	On/Off or de-bounce
Frequency:	47Hz-63Hz
Transient immunity:	EN50082
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)
Power consumption:	0.5W maximum

‘115V ac’ Variant

Active On state:	>95V ac rms, 150V ac rms maximum
Inactive OFF state:	<35V ac rms
Main input current:	More than 2mA required for ‘ON’
Maximum input current:	8mA

V-I curve for 115V ac Operation

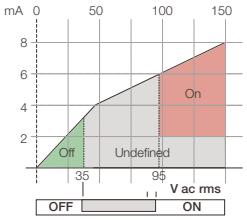


* The threshold may be between Vmaxoff and Vmion Ioff is defined at the threshold

‘230V ac’ Variant

Active ON state:	>180V ac rms, 264V ac rms maximum
Inactive OFF state:	<70V ac rms
Min input current:	More than 2mA required for ‘ON’
Maximum input current:	9mA

V-I curve for 230V ac Operation



Note:

Inadvertent Use of the Wrong Range

115V type on 230V ac No damage will result. Power dissipation will be higher than desirable for continued use on all 6 channels simultaneously.

THIS IS NOT A RECOMMENDED MODE OF OPERATION

DI16 –Sixteen Channel Digital Input

This digital input module accepts sixteen inputs and can be wired either for voltage input or for contact closure.

Module type:		DI16
No of channels:		16
System isolation:		300V RMS or dc (double insulation)
Channel isolation:		Channels share a common connection ('C')
Power consumption:	Logic:	0.75W maximum
	Contact:	2.0W maximum
Max. voltage across any channel:		30V dc

'Contact' Mode

Module Internal Isolated		
Power supply (P):		16 to18V dc
Contact closure:	ON state:	Input resistance threshold <1KΩ typical
	OFF state:	Input resistance threshold >7KΩ typical
Wetting current:		>4mA
Wetting voltage:		>12V dc

'Logic' Mode

Logic inputs:	ON state:	Input voltage threshold >10.8V dc, 30V maximum
	OFF state:	Input voltage threshold <5.0V dc, –30V minimum
Input current:		3.8mA @ 12V dc; 2.8mA @ 24V dc

DO16 –Sixteen Channel Digital Output

This digital output module provides higher packing density and lower cost per channel. The sixteen digital output module provides sixteen short-circuit protected outputs, which are typically used for control, alarms, or event outputs.

Each channel can drive up to 0.7A and can be used for driving solenoids, relays, lamps, fans, thyristor units, single phase Solid State Relays (SSRs), or some three phase SSRs.

Module type:	DO16
No of channels:	16
Voltage supply (external):	24Vdc ±20%
Leakage current off state:	<10uA
Current output:	
Channel maximum:	0.7A/channel
Module Thermal Cut-off:	90±3°C, restart: 88±3°C
Short Circuit Protection:	0.7A to 1.7A per channel
Output voltage:	>Voltage supply (Vs) less 1V
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	Channels share a common connection
Power consumption:	Module 0.6W maximum
Plant side:	850W maximum

RLY8 –Eight Channel Relay Output

This module provides eight relay outputs. These outputs may require external snubber circuits (application dependent). Module type:

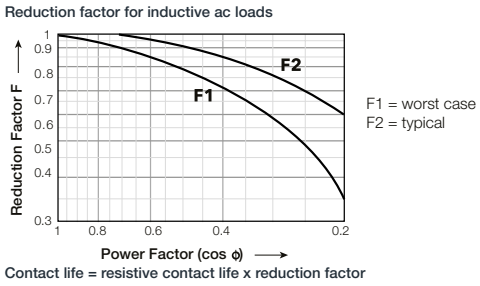
RLY8

No of channels:	8 normally open, AgCdO contacts for best operating life
Max current rating:	2A at up to 240V ac; 0.5A at 200V dc, increasing to 2A at 50V dc (resistive)
Min rating:	100mA at 12V
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)
Contact life:	>10 million operations @ 240V ac, 1A rms >600,000 operations @ 240V ac, 2A rms
Mechanical life:	>30 million operations
De-rating:	The above ratings summarise the performance with resistive loads. With complex loads further de-rating may be required
Power consumption:	2.5W

Relay De-rating

AC Voltage

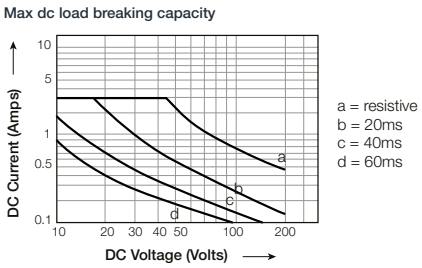
As the AC load becomes more “difficult” a more significant de-rating factor is required. The graph below shows the derating to be applied in terms of contact life, assuming the load requirement is predefined.



Contact life = resistive contact life x reduction factor

DC voltage

DC operation is also limited for difficult loads, particularly where there is significant inductance. Here the working current must be limited as shown where the load time constant (L/R, in ms) is the significant factor.



ZI –Zirconia Input (consult factory for availability)

Module type:	ZI
Input types:	Analogue voltage, Channel 1 –mV (TC), and Channel 2 –(2V Zirconia probe)

Thermocouple Input Specification (Ch1 ONLY)

Input range:	±150mV
Calibration accuracy:	±0.1% of electrical input, ±10µV
Noise:	5µV p-p with 1.6s Filter
Resolution:	<2µV with 1.6s Filter
Sensor break detect:	250nA break high, low or off
Input impedance:	10MΩ

Cold Junction Sensor Specification (Ch1 ONLY)

Temperature Range:	–10°C to +70°C
CJ rejection:	< 30:1
CJ accuracy:	± 1.3°C, ±0.5°C typ. (‘Automatic’ cold junction compensation)

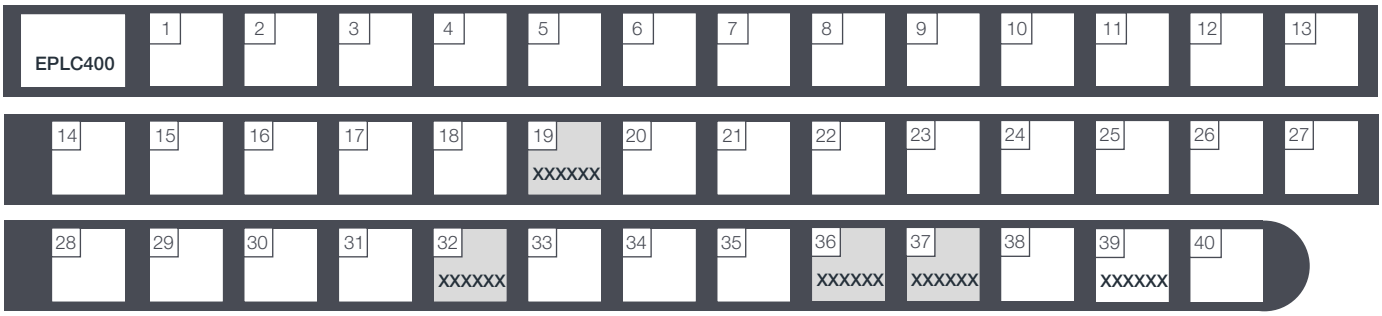
Zirconia Input Specification (Ch2 ONLY)

Input range:	0mV to +1800mV
Calibration accuracy:	± 0.2% of electrical input
Noise:	0.1mV p-p with 1.6s Filter
Resolution:	<50µV with 1.6s Filter
Sensor impedance measurement:	0.1kΩ to 100kΩ ±2%
Input Impedance:	>500MΩ
Input leakage current:	±4.0nA max, ±1nA typical

General Specifications

Power consumption:	1.8W maximum
Common mode rejection:	>80db, 48 - 62Hz
Series mode rejection:	>60db, 48 - 62Hz
System isolation:	300V RMS or dc (double insulation)
Channel isolation:	300V RMS or dc (basic insulation)

E+PLC400 Order codes



Basic Product

EPLC400	Precision PLC

1 Base Size

00	0 Way base (0 I/O slots)
04	4 Way base (4 I/O slots)
08	8 Way base (8 I/O slots)
16	16 Way base (16 I/O slots)

2 Battery Required

BATT	Battery fitted (default)
NOBATT	Battery not fitted

19 Reserved

XXXXXX	Future

20-30 Features

NONE	No features required
WVIS	Webserver visualisation*
PROG	Setpoint prorammer
BATCH	Batch and recording
VAC	Vacuum furnace package
HT	Heat Treatment atmosphere control package (zirconia, carbon diffusion, 3 gas IR)

31 Future

XXXXXX	Future
PH2	“Phase 2” advanced order

32 Future

XXXXXX	Future

33-35 Communications Option

NONE	Modbus TCP Master/Slave, RTU or TCP, EtherNetIP (default)

36 Future

XXXXXX	Future

37 Future

XXXXXX	Future

38 Labels

XXXXX	No custom labels (Eurotherm)
Fnnnn	Custom label

39 Special

XXXXXX	Default

40 USB Memory Stick

NONE	Not required
008G	8GB USB memory stick

3-18 Slot 1-16

BLANK	Blank terminal unit
NONE	No I/O module fitted (default)
AI2-DC	2 ch –analogue input module
AI2-TC	2 ch –isolated TC input module with CJC
AI2-MA	2 ch –isolated analogue input module with 5Ωshunt fitted for mA inputs
AI3	3 ch –isolated 4-20mA analogue input module with 24V Tx PSU
AI4-TC	4 ch –isolated in pairs, TC, with CJC
AI4-MA	4 ch –isolated in pairs, mA input module
AI4-MV	4 ch –isolated in pairs, mV input module
AI8-RT	4 ch –isolated RTD input module*
AI8-TC	8 ch TC with CJC (isolated in pairs)*
AI8-MA	8 ch mA input module (isolated in pairs)*
AI8-FMA	Fast 8 channel isolated mA input module 20ms*
AO2	2 ch –isolated DC (V or mA) output module
DI6-230V	6 ch high voltage Logic (230V ac) input module
DI6-115V	6 ch high voltage Logic (115V ac) input module
DI16	16 ch digital input module
DO16	16 ch digital output module
RLY8	8 ch –Relay output module
ZI	Zirconia Input Module

* Contact factory for availability

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문의하세요

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