



# i-7188 I/O Expansion Boards

## SERIES

### I/O Expansion Board Selection Guide

#### I/O Expansion Board for Prototype, Testing

| Model | Description              | Size          | Used with I-7188XA/XB/XC/EX |
|-------|--------------------------|---------------|-----------------------------|
| X000  | Prototype ( Small size ) | 64mm x 32mm   | XA/XC                       |
| X001  | Prototype ( Large size ) | 64mm x 70mm   | XA/XC                       |
| X002  | Prototype                | 114mm x 170mm | XA/XCXB/EX/XG/EG            |
| X003  | Self-test                | 64mm x 32mm   | XA/XC                       |
| X004  | Self-test                | 64mm x 37mm   | XB/EX/XG/EG                 |
| X005  | Prototype ( Small size ) | 64mm x 37mm   | XB/EX/XG/EG                 |
| X006  | Prototype ( Large size ) | 72mm x 65mm   | XB/EX/XG/EG                 |

#### I/O Expansion Board for D/I, D/O, Timer/Counter, PWM

| Model | Description   | D/I   | D/O | Relay Output | Counter/Timer                   | Used with I-7188XA/XB/XC/EX |
|-------|---------------|---|-----|--------------|---------------------------------|-----------------------------|
| X100  | DI            | 8   | –   | –            | –                               | XC                          |
| X101  | DO            | –   | 8   | –            | –                               | XC                          |
| X102  | Relay Output  | –   | –   | 2            | –                               | XC                          |
| X103  | DI            | 7   | –   | –            | –                               | XC                          |
| X104  | DI, DO        | 8 (each channel can be programmed to DI/DO)   |     | –            | –                               | XC                          |
| X105  | DI, DO        | 8 (each channel can be programmed to DI/DO)   |     | –            | –                               | XC                          |
| X106  | DI, DO        | Can be used as 2 channels DO or 3 channels DI |     | –            | –                               | XC                          |
| X107  | DI, DO        | 6   | 7   | –            | –                               | XB/EX/XG/EG                 |
| X108  | PWM           | 2 Channels PWM                                |     | –            | –                               | XC                          |
| X109  | Photo MOS     | –   | –   | 7            | –                               | XB/EX/XG/EG                 |
| X110  | DI            | 14  | –   | –            | –                               | XB/EX/XG/EG                 |
| X111  | DO            | –   | 13  | –            | –                               | XB/EX/XG/EG                 |
| X116  | Relay Output  | 4   | –   | 6            | –                               | XB/XG/EX/EG                 |
| X119  | DI, DO        | 7   | 7   | –            | –                               | XC/XA/XB/EX/EG/XG           |
|       |               | **Without Case**                              |     | –            | –                               |                             |
| X400  | Timer/Counter | –   | –   | –            | 3 channels 16-bit timer/counter | XC                          |

#### I/O Expansion Board for A/D, D/A, DI, DO

| Model | Description      | D/I | D/O | A/D Channels | Input Range   | D/A Channels | Output Range | Used with I-7188XA/XB/XC/EX |
|-------|------------------|-----|-----|--------------|---------------|--------------|--------------|-----------------------------|
| X200  | A/D              | –   | –   | 1            | 0~2.5V        | –            | –            | XC                          |
| X201  | A/D              | –   | –   | 1            | 0~20mA        | –            | –            | XC                          |
| X202  | A/D              | –   | –   | 7            | 0~20mA        | –            | –            | XB/EX/XG/EG                 |
| X203  | A/D, DI, DO      | 2   | 6   | 2            | 0~20mA        | –            | –            | XB/EX/XG/EG                 |
| X300  | D/A              | –   | –   | –            | –             | 2            | 0~4.095V     | XC                          |
| X301  | A/D, D/A         | –   | –   | 1            | 0~2.5V        | 1            | 0~4.095V     | XC                          |
| X302  | A/D, D/A         | –   | –   | 1            | +/-5V         | 1            | +/-5V        | XC                          |
| X303  | A/D, D/A, DI, DO | 4   | 6   | 1            | +/-5V         | 1            | +/-5V        | XB/EX/XG/EG                 |
| X304  | A/D, D/A, DI, DO | 4   | 4   | 3            | +/-5V         | 1            | +/-5V        | XB/EX/XG/EG                 |
| X305  | A/D, D/A, DI, DO | 2   | 2   | 7            | +/-5V         | 1            | +/-5V        | XB/EX/XG/EG                 |
| X306  | A/D, D/A         | –   | –   | 2            | +/-10V        | –            | –            | XC                          |
| X307  | A/D, D/A         | 2   | 2   | 8            | +/-10V        | –            | –            | XB/EX/XG/EG                 |
| X308  | A/D, DO          | –   | 6   | 4            | 0~10V         | –            | –            | XB/EX/XG/EG                 |
| X309  | A/D, D/A, DI, DO | 3   | 3   | 1            | 0~10V         | 1            | 0~10V        | XB/EX/XG/EG                 |
| X310  | A/D, D/A, DI, DO | 3   | 3   | 2            | 0~20mA /0~10V | 2            | 0~10V        | XB/EX/XG/EG                 |

# i-7188 I/O Expansion Boards

## SERIES

### I/O Expansion Board Selection Guide

#### I/O Expansion Board for RS-232/422/485, DI, DO

| Model    | Description | DI | DO | Channels  | Communication Speed | Used with I-7188XA/XB/XC/EX |
|----------|-------------|----|----|---|---------------------|-----------------------------|
| X500     | RS-232      | -  | -  | One channel (9-wire)<br>** Without Case **                                | 115.2kbps           | XA/XC                       |
| X501     | RS-232      | -  | -  | One channel (5-wire)  | 115.2kbps           | XC                          |
| X502     | RS-232      | -  | -  | One channel (3-wire),<br>and one channel (5-wire)                         | 115.2kbps           | XC                          |
| X503     | RS-232      | -  | -  | One channel (5-wire)  | 115.2kbps           | XB/EX/XG/EG                 |
| X504     | RS-232      | -  | -  | One channel (5-wire),<br>and one channel (9-wire)                         | 115.2kbps           | XB/EX/XG/EG                 |
| X505     | RS-232      | -  | -  | Three channels (5-wire)   | 115.2kbps           | XB/EX/XG/EG                 |
| X506     | RS-232      | -  | -  | Six channels (3-wire)   | 115.2kbps           | XB/EX/XG/EG                 |
| X507     | RS-422      | 4  | 4  | One channel<br>(TxD+, TxD-, RxD+, RxD-)                                   | 115.2kbps           | XB/EX/XG/EG                 |
| X508     | RS-232      | 4  | 4  | One channel (5-wire)  | 115.2kbps           | XB/EX/XG/EG                 |
| X509     | RS-232      | 4  | 4  | Two channels (3-wire)   | 115.2kbps           | XB/EX/XG/EG                 |
| X510     | RS-232      | 5  | 5  | One channel (3-wire),<br>and EEPROM: 128K*2 bytes                         | 115.2kbps           | XB/EX/XG/EG                 |
| X510-128 | RS-232      | 5  | 5  | One channel (3-wire),<br>and EEPROM: 128K bytes                           | 115.2kbps           | XB/EX/XG/EG                 |
| X511     | RS-485      | -  | -  | Three channels<br>(Data+, Data-)  | 115.2kbps           | XB/EX/XG/EG                 |
| X518     | RS-232      | -  | 8  | One channel (5-wire)  | 115.2kbps           | XB/EX/XG/EG                 |
| X560     | RS-232      | -  | -  | Three channels (3-wire),<br>and 8M bytes NAND Flash<br>** Without Case ** | 115.2kbps           | XA/XC/XB/EX<br>/XG/EG       |

#### Memory Expansion Boards

| Model | Description               | Flash Disk          | Battery Backup SRAM Disk | Used with I-7188XA/XB/XC/EX |
|-------|---------------------------|---------------------|--------------------------|-----------------------------|
| X600  | Flash ROM Expansion Board | 4M bytes NAND Flash | -                        | XA/XC/XB/EX/XG/EG           |
| X601  | Flash ROM Expansion Board | 8M bytes NAND Flash | -                        | XA/XC/XB/EX/XG/EG           |
| X607  | Battery backup SRAM Board | -                   | 128K Bytes               | XA/XC/XB/EX/XG/EG           |
| X608  | Battery backup SRAM Board | -                   | 512K Bytes               | XA/XC/XB/EX/XG/EG           |

#### Motion Control Boards

| Model | Description | Motor_axis | Encoder_axis | Encoder_bits | Used with I-7188XA/XB/XC/XG/EX/EG |
|-------|-------------|------------|--------------|--------------|-----------------------------------|
| X702  | Encoder     | -          | 2            | 24           | XB/XG/EX/EG                       |
| X703  | Encoder     | -          | 3            | 24           | XB/XG/EX/EG                       |

# i-7188 I/O Expansion Boards

## SERIES

Used with I-7188XB/EX/XG/EG

### Prototype Board

X002 (114mm x 170mm)



### D/I/O Board

X107 (64mm x 37mm)



#### Specifications:

- 7 channels Open collector output; 30V/100mA
- 6 channels DI (3.5V~30V)

### D/I/O Board

X116 (64mm X 57mm)

**\*\*Without Case\*\***



#### Specifications:

- DI channel: 4
- Isolation: 3750V rms
- Input Voltage: 3.5V ~ 30V
- Response time: 10 KHz Max.
- DO channel: 6 (Form 'A', Normal Open)
- Max. Switching capacity : 60W, 60VA
- Max. Switching voltage : 220Vdc, 250Vac
- Max. Switching current : 5A
- Max. Continuous current : 2A

### Self-test Board

X004 (64mm x 38mm)



### PhotoMos Board

X109 (64mm x 37mm)



#### Specifications:

- Channels: 7 (Form A)
- Continuous load current: 120mA (peak AC)
- Peak load current: 0.3A
- Output Power dissipation : 0.3W
- Output Off state leakage current: 1uA
- Output On resistance : 250hm
- Load voltage : 350V(peak AC)
- Input / Output Isolation : 1,500V AC

### D/I/O Board

X119 (72mm x 57mm)



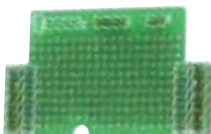
#### Specifications:

- 7 Channels : DO
- 7 Channels : DI

**\*\*Without Case\*\***

### Prototype Board

X005 (38mm x 64mm)



### DI Board

X110 (64mm x 37mm)



#### Specifications:

- Channel : 14
- Input Range/Type : Logic high level (3.5V~30V), Logic low level (0V~1V)

### AD Board

X202 (64mmX37mm)



#### Specifications:

- Channel : 7
- Resolution : 12bit
- Input Range/Type : 0 ~ 20 mA

### Prototype Board

X006 (72mm x 65mm)



### DO Board

X111 (64mmX37mm)



#### Specifications:

- Channel : 13
- Open-collector Output : 70 mA / 30V max
- Isolated : none

### AD Board

X203 (64mmX37mm)



#### Specifications:

- Channel : 2
- Resolution : 12bit
- Input Range/Type : 0 ~ 20 mA
- 2 channels DI
- 6 channels DO

# i-7188 I/O Expansion Boards

## SERIES

Used with I-7188XB/EX/XG/EG

### AD, DA Board

**X303** (64mm x 37mm)



**Specifications:**

- One channel A/D, 12-bit  
Input Range: +/- 5 V
- One channel D/A, 12-bit
- Output Range: +/- 5 V
- 4 channels DI
- 6 channels DO

### AD Board

**X308** (64mm x 37mm)



**Specifications:**

- 4 channels AD
- Resolution : 12bit
- Input Range/Type : 0~10V
- 6 channels DO

### RS-232 Board

**X504** (64mm x 37mm)



**Specifications:**

- COM3: RS-232 port;  
CTS3, RTS3, RXD3, TXD3
- COM4: RS-232 port;  
RT4, CTS4, RTS4, DSR4,  
DTR4, TXD4, RXD4, DCD4

### AD Board

**X304** (64mmX37mm)



**Specifications:**

- 3 channels AD  
Resolution : 12bit  
Input Range/Type : +/- 5 V
- 1 channel DA  
Resolution : 12bit  
Output Range/Type : +/- 5 V
- 4 channels DI
- 4 channels DO

### AD Board

**X309** (64mmX57mm)



*Available soon*

**Specifications:**

- AD channel : 1
- Resolution : 12-bit
- Input Range/Type : 0 ~ 10 V
- Sampling rate : 50KHz
- DA channel : 1
- Resolution : 12-bit
- Input Range/Type : 0 ~ 10 V
- DI channel : 3
- DO channel : 3

### RS-232 Board

**X505** (64mm x 37mm)



**Specifications:**

- COM3: RS-232 port;  
CTS3, RTS3, RXD3, TXD3
- COM4: RS-232 port;  
CTS4, RTS4, RXD4, TXD4
- COM5: RS-232 port;  
CTS5, RTS5, RXD5, TXD5

### AD Board

**X305** (64mmX37mm)



**Specifications:**

- 7 channels AD  
Resolution : 12bit  
Input Range/Type : +/- 5 V
- 1 channel DA  
Resolution : 12bit  
Output Range/Type : +/- 5 V
- 2 channels DI
- 2 channels DO

### AD Board

**X310** (64mmX37mm)



**Specifications:**

- 2 channels AD  
Resolution : 12bit  
Input Range/Type :  
Ch0:0~20 mA; Ch1:0~10 V
- 2 channels DA  
Resolution : 12bit  
Output Range/Type:0~10 V
- 3 channels DI
- 3 channels DO

### RS-232 Board

**X506** (64mm x 37mm)



**Specifications:**

- COM3: RS-232 port; RXD3, TXD3, GND
- COM4: RS-232 port; RXD4, TXD4, GND
- COM5: RS-232 port; RXD5, TXD5, GND
- COM6: RS-232 port; RXD6, TXD6, GND
- COM7: RS-232 port; RXD7, TXD7, GND
- COM8: RS-232 port; RXD8, TXD8, GND

### AD Board

**X307** (64mm x 37mm)



**Specifications:**

- Channel:8
- Resolution : 12bit
- Input Range/Type : +/- 10 V
- 2 channels DI
- 2 channels DO

*Available soon*

### RS-232 Board

**X503** (64mm x 37mm)



**Specifications:**

- COM3: RS-232 port;  
CTS3, RTS3, RXD3, TXD3

### RS-422 Board

**X507** (64mm x 37mm)



**Specifications:**

- COM3: RS-422 port;  
RXD3+, RXD3-, TXD3+, TXD3-
- 4 channels DI
- 4 channels DO

# i-7188 I/O Expansion Boards

## SERIES

Used with I-7188XB/EX/XG/EG

### RS-232 Board X508 (64mm x 37mm)



- Specifications:**
- COM3: RS-232 port
  - TXD, RXD, RTS, CTS, GND
  - 4 channels DI
  - 4 channels DO

### RS-485 Board X511 (64mm x 37mm)



- Specifications:**
- COM3: RS-485 port; Data+, Data-
  - COM4: RS-485 port; Data+, Data-
  - COM5: RS-485 port; Data+, Data-

### Battery Backup SRAM Board X607 (64mm x 32mm)



- Specifications:**
- SRAM: 128K Bytes

### RS-232 Board X509 (64mm x 37mm)



- Specifications:**
- COM3: RS-232 port
  - TXD, RXD, GND
  - COM4: RS-232 port
  - TXD, RXD, GND
  - 4 channels DI
  - 4 channels DO

### RS-232 Board X518 (64mm x 37mm)



- Specifications:**
- COM3: RS-232 port
  - TXD, RXD, RTS, CTS, GND
  - 8 channels DO

### Battery Backup SRAM Board X608 (64mm x 32mm)



- Specifications:**
- SRAM: 512K Bytes

### RS-232 Board X510 (64mm x 37mm)



- Specifications:**
- COM3: RS-232 port
  - TXD, RXD, GND
  - 5 channels DI
  - 5 channels DO
  - EEPROM: 128K x 2 bytes

### RS-232 Board X560 (72mm x 65mm) *\*\*Without Case\*\**



- Specifications:**
- COM3 : RS-232 port; RXD3, TXD3, GND
  - COM4 : RS-232 port; RXD3, TXD3, GND
  - COM5 : RS-232 port; RXD3, TXD3, GND
  - 8M bytes NAND Flash: Endurance : 1,000,000
  - Program/Erase Cycles
  - Data Retention : 10 years

### Encoder Input Board X702 (64mm x 37mm)



- Specifications:**
- 2-axis encoder
  - 24-bit encoder counter
  - Encoder counting mode: Quadrant, CW/CCW
  - Pulse / Direction
  - Max counting rate : 1 MHz
  - Isolated power output: 5V

### RS-232 Board X510-128 (64mm x 37mm)



- Specifications:**
- COM3: RS-232 port
  - TXD, RXD, GND
  - 5 channels DI
  - 5 channels DO
  - EEPROM: 128K bytes

### Flash Memory Board X600/X601 (64mm x 32mm)



- Specifications:**
- X600: 4M bytes NAND: Flash; 0.3W
  - X601: 8M bytes NAND: Flash; 0.4W
  - Endurance: 1,000,000 Program/Erase Cycles
  - Data Retention: 10 years

### Encoder Input Board X703 (64mm x 41mm)



- Specifications:**
- 3-axis encoder
  - 24-bit encoder counter
  - Encoder counting mode: Quadrant, CW/CCW
  - Pulse / Direction
  - Max counting rate : 1 MHz
  - Isolated power output: 5V

# i-7188 I/O Expansion Boards

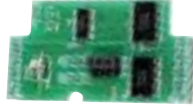
## SERIES

Used with I-7188XC

**Prototype Board**  
**X000** (64mm x 32mm)



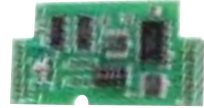
**D/I/O Board**  
**X101** (64mm x 32mm)



**Specifications:**

- 8 D/O channels
- Type: TTL Level;
- Sink current: 64mA

**D/I/O Board**  
**X105** (64mm x 32mm)



**Specifications:**

- 8 channel D/I/O
- 8 channel programmable
- Non-isolated, TTL level

**Prototype Board**  
**X001** (64mm x 70mm)



**Relay Board**  
**X102** (64mm x 32mm)



**Specifications:**

- 2-channel relay output
- Contact rating:  
0.5A/125VAC; 1A/30VDC

**D/I/O Board**  
**X106** (64mm x 32mm)



**Specifications:**

- 2 channels Open collector output; 30V/250mA or 3 channels DI (3.5V-30V)

**Self-test Board**  
**X003** (64mm x 32mm)



**D/I/O Board**  
**X103** (64mm x 32mm)



**Specifications:**

- 7 isolated D/I channels
- Input voltage range: 3.5V-30V

**D/I/O Board**  
**X119** (72mm x 57mm)



**Specifications:**

- 7 Channels : DO
  - 7 Channels : DI
- \*\*Without Case\*\***

**D/I/O Board**  
**X100** (64mm x 32mm)



**Specifications:**

- 8 D/I channels
- Input voltage range: 3.5V-30V

**D/I/O Board**  
**X104** (64mm x 32mm)



**Specifications:**

- 8 D/I channels
- Each channel can be programmed to D/I or D/O
- Non-isolated, TTL level

**A/D Board**  
**X200** (64mm x 32mm)



**Specifications:**

- Channel : 1
- Input Range: 0-2.5V, 12-bit

# i-7188 I/O Expansion Boards

## SERIES

Used with I-7188XC

### AD Board X201 (64mmX32mm)

Available soon



#### Specifications:

- Channel : 1
- Resolution : 12bit
- Input Range/Type : 0 ~ 20 mA

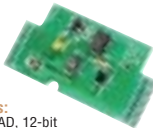
### DA Board X300 (64mm x 32mm)



#### Specifications:

- Channel : 2
- Output Range: 0~4.095V, 12-bit

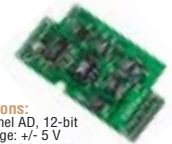
### AD, DA Board X301 (64mm x 32mm)



#### Specifications:

- One channel AD, 12-bit
- Input Range: 0~2.5V
- One channel DA, 12-bit
- Output Range: 0~4.095V

### AD, DA Board X302 (64mm x 32mm)



#### Specifications:

- One channel AD, 12-bit
- Input Range: +/- 5 V
- One channel DA, 12-bit
- Output Range: +/- 5 V

### AD Board X306 (64mmX32mm)

Available soon



#### Specifications:

- 2 channels AD
- Resolution : 12bit
- Input Range/Type : +/- 10 V

### Timer/Counter Board X400 (64mm x 32mm)



#### Specifications:

- 3channels 16-bit timer/counter

### RS-232 Board X500 (64mm x 38mm)



\*\*Without Case\*\*

#### Specifications:

- COM: RS-232 port; R14, CTS4, RTS4, DSR4, TXD4, RXD4, DCD4, DTR4

### RS-232 Board X501 (64mm x 32mm)



#### Specifications:

- COM3: RS-232 port; CTS3, RTS3, RXD3, TXD3

### RS-232 Board X502 (64mm x 32mm)



#### Specifications:

- COM3: RS-232 port; CTS3, RTS3, RXD3, TXD3
- COM4: RS-232 port; RXD4, TXD4

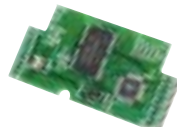
### RS-232 Board \*\*Without Case\*\* X560 (72mmX65mm)



#### Specifications:

- COM3 : RS-232 port; RXD3, TXD3, GND
- COM4 : RS-232 port; RXD3, TXD3, GND
- COM5 : RS-232 port; RXD3, TXD3, GND
- 8M bytes NAND Flash;
- Endurance : 1,000,000
- Program/Erase Cycles
- Data Retention : 10 years

### Flash Memory Board X600/X601 (64mm x 32mm)



#### Specifications:

- X600: 4M bytes NAND; Flash; 0.3W
- X601: 8M bytes NAND; Flash; 0.4W
- Endurance: 1,000,000
- Program/Erase Cycles
- Data Retention: 10 years

### Battery Backup SRAM Board X607 (64mm x 32mm)



#### Specifications:

- SRAM: 128K Bytes

### Battery Backup SRAM Board X608 (64mm x 32mm)



#### Specifications:

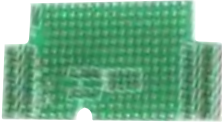
- SRAM: 512K Bytes

# i-7188 I/O Expansion Boards

## SERIES

Used with I-7188XA

**Prototype Board**  
**X000** (64mm x 32mm)



**D/I/O Board** **\*\*Without Case\*\***  
**X119** (72mm x 57mm)



**Specifications:**

- 7 Channels : DO
- 7 Channels : DI

**Flash Memory Board**  
**X600/X601** (64mm x 32mm)



**Specifications:**

- X600: 4M bytes NAND; Flash
- X601: 8M bytes NAND; Flash
- Endurance: 1,000,000 Program/Erase Cycles
- Data Retention: 10 years

**Prototype Board**  
**X001** (64mm x 70mm)



**RS-232 Board** **\*\*Without Case\*\***  
**X500** (64mm x 32mm)



**Specifications:**

- COM: RS-232 port; RI4, CTS4, RTS4, DSR4, TXD4, RXD4, DCD4, DTR4

**Battery Backup SRAM Board**  
**X607** (64mm x 32mm)



**Specifications:**

- SRAM: 128K Bytes

**Self-test Board**  
**X003** (64mm x 32mm)



**RS-232 Board** **\*\*Without Case\*\***  
**X560** (72mm x 65mm)



**Specifications:**

- COM3 : RS-232 port; RXD3, TXD3, GND
- COM4 : RS-232 port; RXD3, TXD3, GND
- COM5 : RS-232 port; RXD3, TXD3, GND
- 8M bytes NAND Flash:
- Endurance : 1,000,000 Program/Erase Cycles
- Data Retention : 10 years

**Battery Backup SRAM Board**  
**X608** (64mm x 32mm)

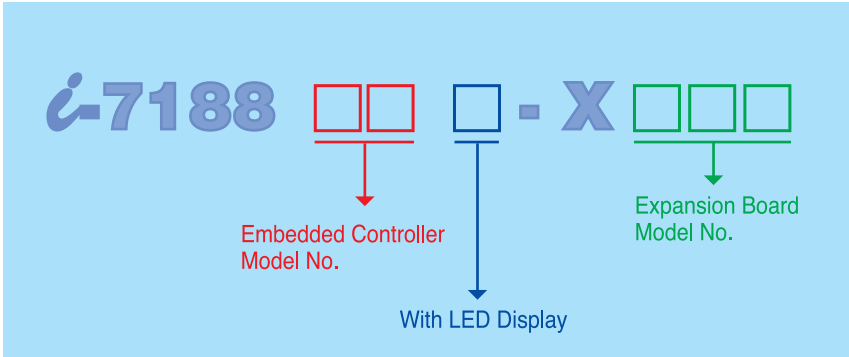


**Specifications:**

- SRAM: 512K Bytes

# i-7188 Expansion Boards Ordering Information

## SERIES



1. Expansion Boards + Embedded Controller ordering information.  
I-7188XA[ ]-X[ ] [ ] [ ]  
I-7188XB[ ]-X[ ] [ ] [ ]  
I-7188XC[ ]-X[ ] [ ] [ ]
2. Expansion Boards + ISaGRAF Embedded Controller ordering information.  
I-7188XG[ ]-X[ ] [ ] [ ]  
With Ethernet I / O  
I-7188EG[ ]-X[ ] [ ] [ ]
3. Ethernet I/O ordering information.  
I-7188EX[ ]-X[ ] [ ] [ ]

### Example.

#### I-7188EGD—X304

- Ethernet ISaGRAF Embedded Controller with LED Display
- With X304 Expansion I/O Board
- 3 Channel A/D/1 Channel D/A / 4 Channel DIO