

# *i-7188* **Palm-size Embedded Controller** SERIES

**I-7188/I-7188D, I-7188XA/I-7188XAD  
I-7188XB/I-7188XBD, I-7188XC/I-7188XCD**



**Operating Temp.:**  
**-25<sub>j</sub>~+75<sub>j</sub>C**

## **Introduction**

The I-7188 series controllers are designed for palm-size embedded systems that require high reliability, PC-compatibility, and compactness at a reasonable price. The controllers can be integrated into an OEM product as a processor core component. By building your product around I-7188 series controller, you reduce the time from design to market introduction, cut development costs, minimize technical risks, and deliver a more reliable product. I-7188 is a first generation product while the I-7188XA, I-7188XB and I-7188XC are all second-generation products. The major differences are communication ports, digital I/O port, and user defined I/O pins. Except I-7188, all I-7188XA/XB/XC support an I/O expansion bus.

## **I/O Expansion Bus and Expansion Board**

The I-7188XA, I-7188XB and I-7188XC support an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as D/I, D/O, A/D, D/A, Timer/Counter, UART, flash memory, battery backup SRAM, AsicKey & other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. Our I/O expansion boards offer features in addition to those provided by the I-7188XA/XB/XC embedded controller. Expansion board can increase controller's I/Os and memory storage capabilities. The integrated modular design of the expansion board allows a fast, easy, and flexible way of upgrading our controller's capability. Each I/O expansion bus supports one expansion board.

# i-7188 *Palm-size Embedded Controller*

## SERIES

**Embedded Controller Selection Guide**

Model Number	I-7188 I-7188D	I-7188XA I-7188XAD	I-7188XB I-7188XBD	I-7188XC I-7188XCD
CPU (80188)	40M Hz	40M Hz	40M Hz/80MHz(NEW)	20.2752 MHz
SRAM	256KB	512KB	256KB*(can be up to 512KB for OEM version, see Note1)	128KB
Battery backup SRAM Board (128K Bytes or 512K Bytes)	No	<b>X607:</b> 128K Bytes memory expansion board <b>X608:</b> 512K Bytes memory expansion board	<b>X607:</b> 128K Bytes memory expansion board <b>X608:</b> 512K Bytes memory expansion board	<b>X607:</b> 128K Bytes memory expansion board <b>X608:</b> 512K Bytes memory expansion board
Flash	256KB/512KB	512KB	512KB	256KB (can be up to 512KB for OEM version; see Note1)
COM Ports	4	4	2 (Note3)	2
Program download	Yes, COM4 (Note 4)	Yes, COM4 (Note 4)	Yes, COM1 (Note 4)	Yes, COM1 (Note 4)
Modem Control	COM1	COM1	No	No
COM2	Non-isolated	3000V Isolation	Non-isolated (OEM version can be isolated, see Note1)	Non-isolated (OEM version can be isolated, see Note1)
Self-Tuner on RS-485	No	COM1 & COM2	COM1 & COM2	COM1 & COM2
Real Time Clock	Yes	Yes	Yes	No (OEM version can be available, Note1)
EEPROM	2K bytes	2K bytes (Can be up to 128K Bytes for OEM customers)	2K bytes (Can be up to 128K Bytes for OEM customers)	2K bytes (Can be up to 128K Bytes for OEM customers)
I/O expansion Bus	No	Yes	Yes	Yes
User Defined Pins	No	No	14	3
D/I (3.5V~30V)	No	2 channels+INIT*	1 channel+INIT*	2 channels+INIT*
D/O (100mA, 30V)	No	2 channels	1 channel	3 channels
Support 64-bit hardware unique serial number	No	Yes	Yes	No
7-segment Display	7188D only	7188XAD only	7188XBD only	7188XCD only
Operating system	MiniOS7	MiniOS7	MiniOS7	MiniOS7
Programming Language	TC/MSC	TC/MSC	TC/MSC	TC/MSC
Power consumption	2.0W (7188) 3.0W (7188D)	2.0W (7188XA) 3.0W (7188XAD)	2.0W (7188XB) 3.0W (7188XBD)	2.0W (7188XC) 3.0W (7188XCD)

**Note1:** Call manufacturer or distributor for detail information

**Note2:** Can choose appropriate I/O expansion board to add D/I/O.

**Note3:** COM1 can be used as 5-wire RS-232 port or 2-wire RS-485 port

**Note4:** The default console port can be set to any one of the com ports (MiniOS7 2.0 or later)

# i-7188 *Palm-size Embedded Controller*

## SERIES



### Features

- 80188-40 embedded CPU
- Built-in RTC, NVRAM, EEPROM
- Built-in COM port: COM1, COM2, COM3, COM4
- Built-in watchdog timer
- Built-in power protection circuit
- Built-in RS-485 network protection circuit
- Built-in MiniOS7
- Program download port: COM4

### Applications

- Factory Automation
- Protocol Converter
- Building Automation

### Ordering Information

- **I-7188/512:**  
Embedded Controller with 512K flash
- **I-7188D/512:**  
I-7188/512 with Display
- **I-7188/256:**  
Embedded Controller with 256K flash
- **I-7188D/256:**  
I-7188/256 with Display

#### Options

- **PWR-24/110:**  
Wall-plug Power Adaptor/110VAC/  
60Hz/3.6W
- **PWR-24/220:**  
Wall-plug Power Adaptor/220VAC/  
50Hz/3.6W
- **PWR-24/230:**  
Wall-plug Power Adaptor/230VAC/  
50Hz/3.6W

### Specifications

- CPU: 80188-40 compatible
- SRAM: 256K bytes
- Flash Memory: 256/512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232 (9 pins) or RS-485
- COM2: RS-485
- COM3: RS-232 (3 pins)
- COM4: RS-232 (3 pins)
- Operating Temp.: -25°C to +75°C
- Storage Temp.: -40°C to +80°C
- Power requirement: Unregulated  
10~30 VDC power
- Power Consumption:  
2.0W for I-7188/512; 3.0W for  
I-7188D/512
- Dimensions:  
123mm x 72mm x 33mm

# i-7188XA *Expandable Embedded Controller*

## SERIES



### Ordering Information

- **I-7188XA:**  
Embedded Controller
- **I-7188XAD:**  
I-7188XA with Display

#### Options

- **PWR-24/110:**  
Wall-plug Power Adaptor/110VAC/  
60Hz/3.6W
- **PWR-24/220:**  
Wall-plug Power Adaptor/220VAC/  
50Hz/3.6W
- **PWR-24/230:**  
Wall-plug Power Adaptor/230VAC/  
50Hz/3.6W
- **X600:**  
4 mega bytes Flash memory board
- **X601:**  
8 mega bytes Flash memory board
- **X607:**  
128K bytes SRAM board
- **X608:**  
512K bytes SRAM board

### Features

- 80188-40 Compatible
- Built-in RTC, NVRAM, EEPROM
- Built-in COM port: COM1, COM2, COM3, COM4
- 3000V Isolation voltage on RS-485 port
- Support I/O expansion bus interface
- Two digital input channels
- Two Open-collector output Channels
- Built-in self-tuner ASIC chip for RS-485 port
- Built-in MinIOS7
- Program download port: COM4

### Specifications

- CPU: 80188-40
- SRAM: 512K bytes
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232 (9 pins) or RS-485 Jumper Select
- COM2: RS-485
- COM3: RS-232 (3 pins)
- COM4: RS-232 (3 pins)
- Digital Input channels: 2
- Digital Output channels: 2
- Operating Temp.: -25°C to +75°C
- Storage Temp.: -40°C to +80°C
- Power requirement: Unregulated 10~30 VDC power
- Power Consumption:  
2.0W for I-7188XA;  
3.0W for I-7188XAD
- Dimensions:  
123mm x 72mm x 33mm

# i-7188XB *Expandable Embedded Controller*

## SERIES



### Ordering Information

- **I-7188XB:**  
Embedded Controller with 512K Flash and 256K SRAM
- **I-7188XBD:**  
I-7188XB-256 with Display
- OEM Version**
- **I-7188XB/512:**  
Embedded Controller with 512K Flash and 512K SDRAM
- **I-7188XBD/512:**  
I-7188XB-512 with Display
- Options**
- **PWR-24/110:**  
Wall-plug Power Adaptor/110VAC/ 60Hz/3.6W
- **PWR-24/220:**  
Wall-plug Power Adaptor/220VAC/ 50Hz/3.6W
- **PWR-24/230:**  
Wall-plug Power Adaptor/230VAC/ 50Hz/3.6W
- **X600:**  
4 mega bytes Flash memory board
- **X601:**  
8 mega bytes Flash memory board
- **X607:**  
128K bytes SRAM board
- **X608:**  
512K bytes SRAM board

### Features

- 64-bit hardware unique serial number inside
- User defined DI / DO
- COM driver support interrupt & 1K QUEUE input & output buffer
- COM port: COM1, COM2
- Built-in RTC, NVRAM, EEPROM
- One DI and one DO channel
- Built-in I/O expansion bus interface
- Can add on one expansion board
- Built-in self-tuner ASIC chip for RS-485 port
- Optional 7-segment LED display
- Built-in ICP DAS's MiniOS7
- Program download port: COM1

### Specifications

- CPU: 80188-40 Compatible
- SRAM: 256K bytes (for I-7188XB)
- 512K bytes (for I-7188XB/512)
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232 (5 pins) / RS-485
- COM2: RS-485
- Digital Input channel: 1
- Digital Output channel: 1
- User defined I/O pins: 14
- Operating Temp.: -25°C to +75°C
- Storage Temp.: -40°C to +80°C
- Power requirement: Unregulated 10~30 VDC power
- Power Consumption:  
2.0W for I-7188XB;  
3.0W for I-7188XBD
- Dimensions:  
123mm x 72mm x 33mm

# i-7188XG *Expandable ISaGRAF Embedded Controller*

## SERIES



### Ordering Information

- **I-7188XG:**
  - ISaGRAF Embedded Controller
- **I-7188XGD:**
  - ISaGRAF Embedded Controller with Display
- **Options**
- **PWR-24/110:**
  - Wall-plug Power Adaptor/110VAC/ 60Hz/3.6W
- **PWR-24/220:**
  - Wall-plug Power Adaptor/220VAC/ 50Hz/3.6W
- **PWR-24/230:**
  - Wall-plug Power Adaptor/230VAC/ 50Hz/3.6W
- **X607:**
  - 128K bytes SRAM board
- **X608:**
  - 512K bytes SRAM board
- **ISaGRAF-256:**
  - ISaGRAF Workbench Software up to 256 I/O Tags.
- **ISaGRAF-256-E:**
  - ISaGRAF Workbench Software up to 256 I/O Tags + one English Manual.
- **ISaGRAF-256-C:**
  - ISaGRAF Workbench Software up to 256 I/O Tags + one Chinese Manual.

### Features

- Include features of I-7188XB
- Built-in ISaGRAF driver & License
- Programming Languages:
  - IEC61131-3: LD, ST, FBD, SFC, IL □
  - Flow Chart.
- Modbus RTU (RS232/RS485) □□
  - protocol to integrate to SCADA □□
  - softwares and HMI.
- Modbus Master protocol (RS485) to □
  - link to other devices which support □
  - Modbus RTU protocol.
- All I-7000 & I-87K series I/O modules □
  - can be integrated as remote I/O modules.
- Controller to Controller Data Exchange □
  - via RS485.
- Support ICP DAS's MMICON - Man □
  - Machine Interface
- Data log: data, date & time can be □
  - stored at X607/X608, and then PC □
  - can load these data via RS232/RS485.
- SMS: When integrating with a GSM Modem, □
  - Short Message Service is available.

### Specifications

- CPU: 80188-40 Compatible
- SRAM: 512K bytes
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232 (5 pins) / RS-485
- COM2: RS-485
- Digital Input channel: 1
- Digital Output channel: 1
- User defined I/O pins: 14
- Operating Temp.: -25°C to +75°C
- Storage Temp.: -40°C to +80°C
- Power requirement: Unregulated
  - 10~30 VDC power
- Power Consumption:
  - 2.0W for I-7188XG;
  - 3.0W for I-7188XGD
- Dimensions:
  - 123mm x 72mm x 33mm

# i-7188XC *Expandable Embedded Controller* SERIES



## Ordering Information

- **I-7188XC:**
  - Embedded Controller
- **I-7188XCD:**
  - I-7188XC with Display
- Options**
- **PWR-24/110:**
  - Wall-plug Power Adaptor/110VAC/ 60Hz/3.6W
- **PWR-24/220:**
  - Wall-plug Power Adaptor/220VAC/ 50Hz/3.6W
- **PWR-24/230:**
  - Wall-plug Power Adaptor/230VAC/ 50Hz/3.6W
- **X600:**
  - 4 mega bytes Flash memory board
- **X601:**
  - 8 mega bytes Flash memory board
- **X607:**
  - 128K bytes SRAM board
- **X608:**
  - 512K bytes SRAM board

## Features

- 80188-20 embedded CPU
- Cost-effective version of I-7188 □ series
- User defined DI / DO
- COM driver support interrupt & □ 1K QUEUE input & output buffer
- COM port: COM1, COM2
- Built-in EEPROM
- Built-in I/O expansion bus
- Can add on one expansion board
- Built-in self-tuner ASIC chip for □ RS-485 port
- Optional 7-segment LED display
- Built-in ICP DAS's MiniOS7
- Program download port: COM1

## Specifications

- CPU: 80188-20™ or compatible
- SRAM: 128K bytes
- Flash Memory: 256K bytes
- EEPROM: 2048 bytes
- COM1: RS-232 (5 pins) / RS-485
- COM2: RS-485
- Digital Input Channels: 3
  - Logic low level: 0V~1V
  - Logic high level: 3.5V~30V
- Digital Output Channels: 3
  - Open collector to 30V Max.
  - Output current: 100mA
- Operating Temp.: -25°C to +75°C
- Storage Temp.: -40°C to +80°C
- Power requirement: Unregulated
  - 10~30 VDC power
- Power Consumption:
  - 2.0W for I-7188XC;
  - 3.0W for I-7188XCD
- Dimensions:
  - 119mm x 72mm x 33mm





*Available soon*

### Ordering Information

- iVIEW-100-ISaGRAF:
- iVIEW-100 Handheld Embedded
- Controller (without ISaGRAF Driver)

#### Options

- PWR-24/110:
- Wall-plug Power Adaptor/110VAC/
- 60Hz/3.6W
- PWR-24/220:
- Wall-plug Power Adaptor/220VAC/
- 50Hz/3.6W
- PWR-24/230:
- Wall-plug Power Adaptor/230VAC/
- 50Hz/3.6W
- S256:
- 256K bytes battery backup ram
- S512:
- 512K bytes battery backup ram
- ISaGRAF-256:
- ISaGRAF Workbench Software
- up to 256 I/O Tags.

### Handheld Embedded Controller

#### Features

- Built-in ISaGRAF driver & License
- Programming Languages:
  - IEC61131-3: LD, ST, FBD, SFC, IL
  - Flow Chart.
- Modbus RTU(RS232) protocol to integrate
  - to SCADA software and HMI.
- Modbus Master protocol (RS232/□
- RS485) to link to other devices which □
- support Modbus RTU protocol.
- All I-7000 & I-87K series I/O modules
  - can be integrated as remote I/O modules.
- Keypad: Input parameters - Boolean, □
- Number, Real, String, function key □
- are available.
- LCD Display: Text, Number, Real &
- Boolean Icon can be shown on the LCD.
- Data log: data, alarm, date & time can be
- stored at S256/S512, and then PC can
- load these data via RS232
- SMS: When integrating with a GSM Modem,
- Short Message Service is available.
- Bitmap Background: user can use bitmap
- files to be backgrounds of the LCD.

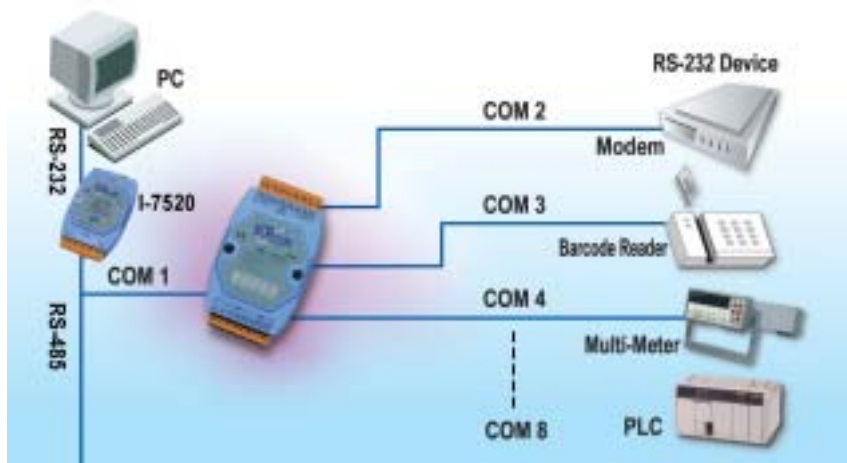
#### Common Specifications

- CPU: 80188-40 Compatible
- SRAM: 512K bytes
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232 (5 pins)
- COM2: RS-232 (5 pins) / RS-485
- Digital Input Channel: 4
- Digital Output Channel:
  - 2 relay output. (Default) or
  - 4 open collector output (Jumper Selected)
- Display: 128\*64 dots, STN, YellowGreen □
- Backlight LCD.
- Full numeric membrane keypad
- One buzzer inside
- Operating Temp.: -25°C to +75°C
- Storage Temp.: -40°C to +80°C
- Power requirement: Unregulated 10~30
- VDC power
- Power Consumption: 3.0W
- Dimensions:
  - 181mm X 116mm X 42mm



# **i-752N** *Intelligent Communication Controller* **SERIES**

**I-7521/I-7521D/I-7522/I-7522D/I-7522A/I-7522AD/  
I-7523/I-7523D/I-7524/I-7524D/I-7527/I-7527D**



## **Introduction**

There are many RS-232 devices in industry applications. Nowadays it becomes important to link all those RS-232 devices together for automation & information collection. Usually those RS-232 devices are far away from the host-PC & widely distributed in the factory. So it is not a good idea to use multi-serial cards to connect all these RS-232 devices together. Our I-752N series products can be used to link multiple RS-232 devices using a single RS-485 network. The RS-485 is famous for its easy maintenance, simple cabling, reliability and low cost. When the user wants to connect RS-232 devices to 10 BaseT, our I-7188EN series products can meet this demand.

### **Can be used as an Addressable RS-485 to RS-232 Converter**

Basically our I-752N products are Master-type converters. The I-752N uses our R.O.C. Patent 086674. Other competitor's converters are Slave-type and can't work independently without a host-PC. In real industrial application, the demand is different case by case and customers are not satisfied with Slave-type devices. The I-752N is very powerful and can analyse the local RS-232 device, D/I or D/O without a host-PC.

### **Can be used as an Embedded Controller**

### **Can be used as RS-485 to RS-232 Device Server**

The Device Server is an appliance that network enables any device with a serial communication port. Our Intelligent Communication Controllers allow those devices to become connected to the RS-485 network.

# **Intelligent Communication Controller** SERIES

## Features

- COM1 of the I-7521, I-7522, I-7522A, I-7523, I-7524 and I-7527 can be used as RS-232 port or RS-485 port
- COM1 can be used to download programs.
- Built-in "Addressable RS-485 to RS-232 Converter" firmware
- Support Dual-Watchdog commands
- Support Power-up value & safe value for D/O
- I-7521 support one RS-232 device
- I-7522 support two RS-232 devices
- I-7522A support one RS-232 and one RS-422 device
- I-7523 support three RS-232 devices
- I-7524 support four RS-232 devices
- I-7527 support seven RS-232 devices
- Watchdog timer provides fault tolerance and recovery
- R.O.C. Invention Patent No. 086674, No. 103060, No. 132457

## Specifications

- CPU: 80188; 20MHz; for I-7521/7522/7523
- 40MHz; for I-7522A/7524/7527
- SRAM: 28K bytes for I-7521/7522/7523
- 256K bytes for I-7522A/7524/7527
- Flash ROM: 12K bytes for I-7522A/7524/7527
- 256K bytes for I-7521/7522/7523
- EEPROM: 2048 bytes
- Communication speed: 115.2K bps max.
- RS-232 interface connector: Male DB-9 or screw terminal block
- RS-485 interface connector for I-7521/7522/7523: 13-pin screw terminal block (accept 16~26 AWG wires); 3.81mm pitch
- D/I: 3.5V~30V
- D/O: 100mA/30V
- Operating temperature: -25°C to +75°C
- Storage temperature: -40°C to +80°C
- Dimensions: 123mm x 72mm x 33mm
- Power requirement: Unregulated 10~30 VDC power
- Power consumption: 2W (without display)
- 3W (with display)

## Applications

- Factory Automation
- Building Automation
- Home Automation

# i-752N Intelligent Communication Controller

## SERIES

**I-752N Communication Controller Selection Guide**

Model Number	I-7521/ 7521D	I-7522/ 7522D	I-7522A/ 7522AD	I-7523/ 7523D	I-7524/ 7524D	I-7527/ 7527D
CPU (80188)	20M	20M	40M	20M	40M	40M
SRAM	128KB	128KB	256KB	128KB	256KB	256KB
Flash	256KB	256KB	512KB	256KB	512KB	512KB
COM1 Port Program Download	RS-232/ RS-485 (Note1)	RS-232/ RS-485 (Note1)	RS-232/ RS-485 (Note2)	RS-232/ RS-485 (Note1)	RS-232/ RS-485 (Note2)	RS-232/ RS-485
COM2 Port	RS-485 (Note3)	RS-485 (Note3)	RS-485	RS-485 (Note3)	RS-485	RS-485
COM3 Port	—	RS-232 (Note4)	RS-422 (Note6)	RS-232 (Note4)	RS-232 (Note4)	RS-232 (Note5)
COM4 Port	—	—	—	RS-232 (Note5)	RS-232 (Note4)	RS-232 (Note5)
COM5 Port	—	—	—	—	RS-232 (Note4)	RS-232 (Note5)
COM6 Port	—	—	—	—	—	RS-232 (Note5)
COM7 Port	—	—	—	—	—	RS-232 (Note5)
COM8 Port	—	—	—	—	—	RS-232 (Note5)
D/O	3	1	5	—	1	1
D/I	3	3	5	2	1	1
user Defined I/O	3	—	—	—	—	—
Real Time Clock	—	—	Y	—	Y	Y
Embedded O.S.	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7
<b>Note1:</b> RS-232/RS-485 <input type="checkbox"/> RS-485: D1+, D1-; Self-tuner inside <input type="checkbox"/> RS-232: TXD, RXD, RTS, CTS, GND <input type="checkbox"/> DB-9 male connector			<b>Note3:</b> RS-485 (D2+, D2-; Self-tuner inside); <input type="checkbox"/> 3000V isolation <b>Note4:</b> RS-232 (TXD, RXD, RTS, CTS, GND) <b>Note5:</b> RS-232 (TXD, RXD, GND) <b>Note6:</b> RS-422 (RXD3+, RXD3-, TXD3+, TXD3-, <input type="checkbox"/> GND)			
<b>Note2:</b> RS-232/RS-485 <input type="checkbox"/> RS-485: D1+, D1-; Self-tuner inside <input type="checkbox"/> RS-232: TXD, RXD, RTS, CTS, GND						

## Ordering Information

- **I-7521:** □ Intelligent Communication Controller
- **I-7521D:** □ I-7521 with display
- **I-7522:** □ Intelligent Communication Controller
- **I-7522D:** □ I-7522 with display
- **I-7522A:** □ Intelligent Communication Controller
- **I-7522AD:** □ I-7522 with display
- **I-7523:** □ Intelligent Communication Controller
- **I-7523D:** □ I-7523 with display
- **I-7524:** □ Intelligent Communication Controller
- **I-7524D:** □ I-7524 with display
- **I-7527:** □ Intelligent Communication Controller
- **I-7527D:** □ I-7527 with display

## Options

- **PWR-24/110:** Wall-plug Power  
□ Adaptor/110VAC, 60Hz, 3.6W
- **PWR-24/220:** Wall-plug Power  
□ Adaptor/220VAC, 50Hz, 3.6W
- **PWR-24/230:** Wall-plug Power  
□ Adaptor/230VAC, 50Hz, 3.6W

# *Palm-size Embedded Internet/ Ethernet Controller*

## SERIES

### I-7188EX/I-7188EXD



## Why! Ethernet Solutions

"Embedded Internet" and "Embedded Ethernet" are hot topics today. Nowadays Ethernet protocol has become the de-facto standard for local area networks. Via the Internet, connectivity is occurring everywhere, from home appliances to vending machines to testing equipment to UPS...etc. Many embedded designers now face the dilemma of adding Ethernet interfaces to their products, either for use with local networks or for connecting to the Internet. Solutions to this problem include both hardware and software. Connecting via Ethernet requires a software protocol called TCP/IP. The installed base of Ethernet networks is huge and growing. Most office building, factories, and new homes have installed Ethernet networks. With Ethernet, the network is always available. Using Ethernet for networks in industrial area is appealing because the required cabling is already installed.

## Introduction

The I-7188EX is powered by an 80188-40/80186-80(New) processor with 512K bytes of static RAM, and 512K bytes of Flash memory. One serial RS-232 port and one RS-485 port are provided. Ethernet support is provided by a NE-2000 compatible controller with 16K bytes of on-chip buffer memory and 10Base-T media interface. The I-7188EX also provides 14 user defined I/O lines. A cost-effective I/O expansion board with A/D, D/A, relays drivers and protected inputs are available. The I-7188EX also supports battery back-up SRAM board and Flash-ROM board, providing non-volatile mass storage from 128K bytes to 64 mega bytes. The 10BASE-T port is equipped with a RJ-45 connector. The 10BASE-T interface supports max. 100-meter Cable length between I-7188EX and the network hub.

# ***Palm-size Embedded Internet/ Ethernet Controller*** SERIES

## TCP/IP Library

The software library supports TCP/IP protocols & web server. Support the following protocols,

- TCP, Transmission Control Protocol
- UDP, User Datagram Protocol
- IP, Internet Protocol
- ICMP, Internet Control Message Protocol
- ARP, Address Resolution Protocol

## Features

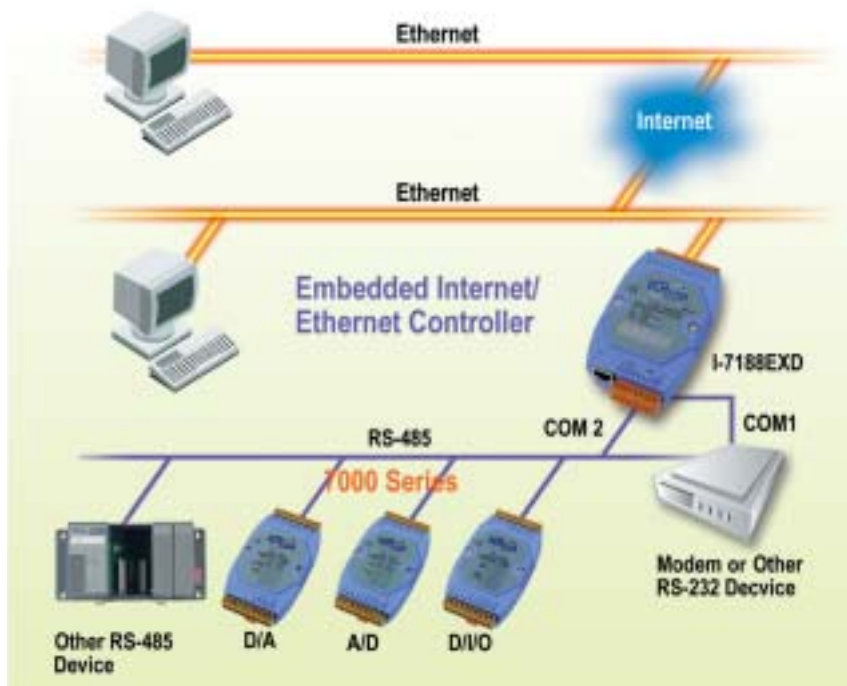
- 80188-40 embedded CPU
- Supports a variety of TCP/IP features, including TCP, UDP, IP, ICMP, ARP,
- 10 BaseT NE2000 compatible Ethernet Controller
- Remote Configuration, Diagnostics
- 64-bit hardware unique serial number inside
- COM driver support interrupt & 1K QUEUE input & output buffer
- COM port: COM1, COM2
- Built-in RTC, NVRAM, EEPROM
- User defined I/O lines: 14
- Built-in I/O expansion bus interface
- Built-in self-tuner ASIC chip for RS-485 port
- Built-in MiniOS7
- Program download port: COM1
- **Support VxComm technique & Xserver**

## Specifications

- RDC 8820 (40MHz)
- SRAM: 512K bytes (7188EX); 256K bytes (7188EX/256)
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- Ethernet port: 10 BaseT
- COM1: RS-232—TXD, RXD, RTS, CTS, GND
- COM2: RS-485—D1+, D1-, self-tuner ASIC inside
- User defined I/O pins: 14
- Power requirement: 10 to 30VDC (non-regulated)
- Power consumption: 2.0W for I-7188EX; 3.0W for I-7188EXD
- Dimensions: 123mm x 72mm x 33mm

# *i-7188EX* **Palm-size Embedded Internet/ Ethernet Controller**

## SERIES



### Ordering Information

- **I-7188EX:** I-7188EXD without display
- **I-7188EXD:** Embedded Ethernet/Internet Controller with 7-segment display

### Power Supply Options:

- **PWR-24/110:** Wall-plug Power Adapter/110VAC, 60Hz, 3.6W
- **PWR-24/220:** Wall-plug power Adapter/220VAC, 50Hz, 3.6W
- **PWR-24/230:** Wall-plug power Adapter/230VAC, 50Hz, 3.6W
- **DIN-KA52F:** 1.05 Amp. DIN-Rail Mounting Power supply

### Add-on Options:

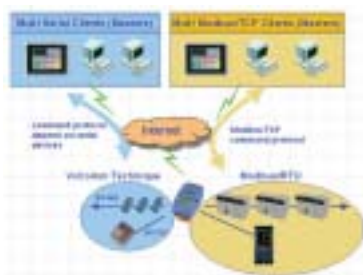
- **X600:** 4-Mega Bytes NAND Flash memory expansion board
- **X601:** 8-Mega Bytes NAND Flash memory expansion board
- **X607:** 128K bytes SRAM expansion board
- **X608:** 512K bytes SRAM expansion board

# i-7188 Modbus/TCP Embedded Controller SERIES



## Default firmware features

- Converts single Modbus/TCP to □□
- multi Modbus/RTU
- Supports VxComm technique for □□
- every COM port of controllers
- Allowed multi-client (or master) □□
- access simultaneously
- Firmware modifiable



## Modbus SDK ( in C language )

If the default firmware doesn't totally suit your requirement. You can use the Modbus SDK to modify the default firmware to add extra functions. The Modbus SDK has below features:

- Supports extra user-defined command protocol (TCP/IP)
- Register based programming method (easy to use)
- Provides user-defined registers
- Can link to Modbus/RTU slave devices
- Can link to non-Modbus/RTU serial devices
- Supports X boards
- Xserver SDK compatible

## Hardware specifications

Same as I-7188EX, I-7188EXD

## Ordering Information

- **I-7188EX -MTCP:** Modbus/TCP embedded controller
- **I-7188EXD -MTCP:** Modbus/TCP embedded controller (with LED display)





### Ordering Information

- **I-7188EA:**  
Embedded Internet/Ethernet Controller
- **I-7188EAD:**  
I-7188EA with Display

### Options

- **PWR-24/110:**  
Wall-plug Power Adaptor/110VAC, 60Hz, 3.6W
- **PWR-24/220:**  
Wall-plug Power Adaptor/220VAC, 50Hz, 3.6W
- **PWR-24/230:**  
Wall-plug Power Adaptor/230VAC, 50Hz, 3.6W

### Introduction

Compared to I-7188EX, the I-7188EA adds seven open-collector output channels and six digital Input channels. I/O Expansion bus has been occupied by DI/O expansion board.

### Features

- 80188-40 embedded CPU
- 10BASE-T Ethernet Controller, NE2000 compatible
- 64-bit hardware unique serial number inside
- COM port: COM1, COM2
- Built-in RTC, NVRAM, EEPROM
- DI: 6 / DO: 7
- Built-in self-tuner ASIC chip
- Built-in MiniOS7
- TCP/IP
- Built-in RTC, NVRAM, EEPROM
- Program download port: COM1
- **Support VxComm technique & Xserver**

### Specifications

- CPU: 80188-40
- SRAM: 512K bytes
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Digital Input channels: 6  
Logic low level: 0V~1V  
Logic high level: 3.5V~30V
- Digital Output channels: 7  
Open collector to 30V Max.  
Output current: 100mA
- Real Time Clock
- COM1: RS-232
- COM2: RS-485
- Power requirement:  
10~30VDC (non-regulated)
- Power consumption:  
2.0W for I-7188EA;  
3.0W for I-7188EAD
- Dimensions: 123mm x 72mm x 33mm

# i-7188EG *Expandable ISaGRAF Embedded Controller*

## SERIES



### Ordering Information

#### ■ I-7188EG:

- Expandable ISaGRAF Embedded
- Controller

#### ■ I-7188EGD:

- Expandable ISaGRAF Embedded
- Controller with Display

#### Power Supply Options:

- PWR-24/110: Wall-plug Power □
- Adapter/110VAC, 60Hz, 3.6W
- PWR-24/220: Wall-plug power □
- Adapter/220VAC, 50Hz, 3.6W
- PWR-24/230: Wall-plug power □
- Adapter/230VAC, 50Hz, 3.6W
- DIN-KA52F: 1.05 Amp. DIN-Rail □
- Mounting Power supply

#### Add-on Options:

- X607: 128K bytes SRAM expansion □
- board
- X608: 512K bytes SRAM expansion □
- board
- ISaGRAF-256:
- ISaGRAF Workbench Software up □
- to 256 I/O Tags.
- ISaGRAF-256-E:
- ISaGRAF Workbench Software up to
- 256 I/O Tags + one English Manual.
- ISaGRAF-256-C:
- ISaGRAF Workbench Software up to
- 256 I/O Tags + one Chinese Manual.

### Introduction

Compared to I-7188EX, the I-7188EG has the ISaGRAF driver embedded inside.

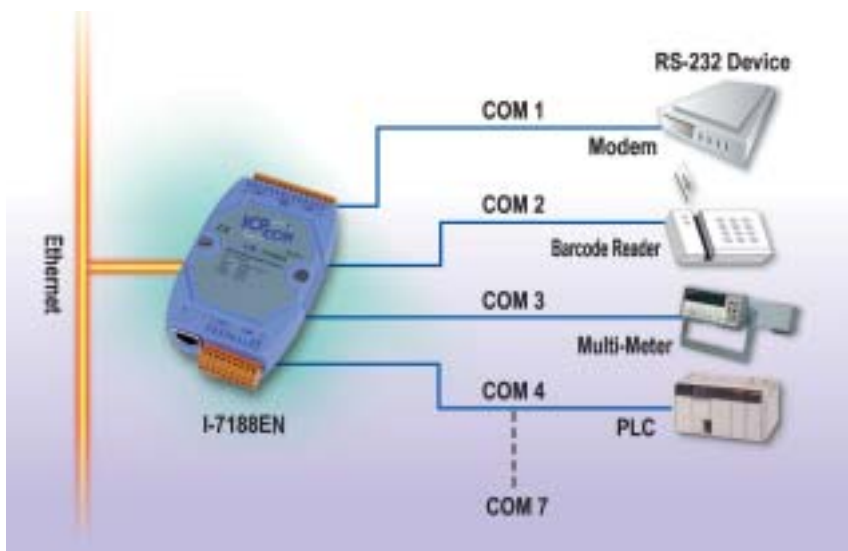
### Features

- Include features of I-7188EX
- Built-in ISaGRAF driver & License
- Programming Languages:
  - IEC61131-3: LD, ST, FBD, SFC, IL □
  - Flow Chart.
- Modbus RTU (RS232) and Modbus □
- TCP/IP (Ethernet) protocol to □□
- integrate to SCADA softwares and HMI.
- Modbus Master protocol (RS485) □
- to link to other devices which □□
- support Modbus RTU protocol.
- All I-7000 & I-87K series I/O □□
- modules can be integrated as □□
- remote I/O modules.
- Controller to Controller Data □□
- Exchange via Ethernet & RS485.
- Support ICP DAS's MMICON - Man □
- Machine Interface
- Data log: data, date & time can be □
- stored at X607/X608, and then
- PC can load these data via RS232 & □
- Ethernet.
- SMS: When integrating with a GSM □
- Modem, Short Message Service is □
- available.

### Specifications

- CPU: 80188 40MHz
- SRAM: 512K bytes
- Flash Memory: 512K bytes □□
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- Ethernet port: 10Base-T
- COM1: RS-232—TXD, RXD, RTS, □
- CTS, GND
- COM2: RS-485—D1+, D1-, self-tuner □
- ASIC inside
- User defined I/O pins: 14
- Power requirement: 10 to 30VDC □
- (non-regulated)
- Power consumption: 2.0W for
- I-7188EG; 3.0W for I-7188EGD
- Dimensions: 123mm x 72mm x 33mm

# *i-7188EN* Internet Communication Controller SERIES



## Introduction

The I-7188EX, Embedded Internet/Ethernet Controller, focuses on embedded control applications while the I-7188EN, Internet Communication Controller, focuses on communication applications. According to different embedded firmware program, the Internet Communication Controller can be used as Device Server or Addressable Ethernet to RS-232/485/422 Converter or Embedded Internet/Ethernet Controller. The user should refer to comparison table to choose the optimal product. Now we offer a wide range of Internet Communication Controllers, such as I-7188E1/E2/E3/E4/E5/E8. Except for the RTC circuitry, the basic hardware of the I-7188EN is similar to the I-7188EX. Since there are too many configurations for the I-7188EN series product, an OEM or ODM version is welcomed.

## Features

- 80188-40 embedded CPU / 80186-80(New)
- Supports a variety of TCP/IP features, including TCP, UDP, IP, ICMP, ARP
- 10 BaseT NE2000 compatible Ethernet Controller
- Remote Configuration; Diagnostics
- COM driver support interrupt & 1K QUEUE input & output buffer
- Support serial port
- Built-in EEPROM

# i-7188EN Internet Communication Controller SERIES

## Features

- Built-in self-tuner ASIC chip for RS-485 port
- I-7188E1 support one RS-232 port
- I-7188E2 support one RS-232 port and one RS-485 port
- I-7188E3 support one RS-232 port, one RS-485 port one RS-422/485 port □ and several D/I/O lines
- I-7188E3-232 support two RS-232 ports, one RS-485 port and several □ D/I/O lines
- I-7188E4 support three RS-232 ports and one RS-485 port
- I-7188E5 support four RS-232 ports and one RS-485 port
- I-7188E5-485 support one RS-232 port and four RS-485 ports
- I-7188E8 support seven RS-232 ports and one RS-485 port
- 7-segment LED display for I-7188END
- Built-in MiniOS7
- Program download port: COM1
- **Support VxComm technique & Xserver**

## Specifications

- CPU: 80188 40MHz
- SRAM: 384K bytes
- Flash Memory: 512K bytes
- EEPROM: 2048 bytes.
- Ethernet port: 10Base-T
- U.S patent NO.6,401,159 B1
- R.O.C. Invention Patent No. 086674, No. 103060, No. 132457
- D/I: 3.5V~30V
- D/O: 100mA/30V
- Operating temperature: -25°C to +75°C
- Storage temperature: -40°C to +80°C
- Dimensions: 123mm x 72mm x 33mm
- Power requirement: Unregulated 10~30 VDC power
- Power consumption: 2W (without display); 3W (with display)

## Applications

- Factory Automation
- Building Automation
- Home Automation

# i-7188EN Internet Communication Controller SERIES

## Internet Communication Controller Selection Guide

Model Number	I-7188E1	I-7188E2	I-7188E3	I-7188E3-232	I-7188E4	I-7188E5	I-7188E5-485	I-7188E8
CPU (80188)	40M	40M	40M	40M	40M	40M	40M	40M
SRAM	384KB	384KB	384KB	384KB	384KB	384KB	384KB	384KB
Flash	512KB	512KB	512KB	512KB	512KB	512KB	512KB	512KB
Ethernet Port	10 BaseT	10 BaseT	10 BaseT	10 BaseT	10 BaseT	10 BaseT	10 BaseT	10 BaseT
COM1 Port	RS-232/ (Note1)	RS-232/ (Note1)	RS-232/ (Note1)	RS-232/ (Note1)	RS-232/ (Note1)	RS-232/ (Note1)	RS-232/ (Note1)	RS-232/ (Note1)
COM2 Port	—	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)
COM3 Port	—	—	RS-422 (Note5)	RS-232 (Note1)	RS-232 (Note1)	RS-232 (Note1)	RS-485 (Note3)	RS-232 (Note2)
COM4 Port	—	—	—	—	RS-232 (Note4)	RS-232 (Note1)	RS-485 (Note3)	RS-232 (Note2)
COM5 Port	—	—	—	—	—	RS-232 (Note1)	RS-485 (Note3)	RS-232 (Note2)
COM6 Port	—	—	—	—	—	—	—	RS-232 (Note2)
COM7 Port	—	—	—	—	—	—	—	RS-232 (Note2)
COM8 Port	—	—	—	—	—	—	—	RS-232 (Note2)
DI	—	—	4	4	—	—	—	—
DO	—	—	4	4	—	—	—	—
RTC	N	N	N	N	N	N	N	N
Embedded O.S.	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7

**Note1:** RS-232, TXD, RXD, RTS, CTS, GND

**Note2:** RS-232, TXD, RXD, GND

**Note3:** RS-485, D2+, D2-; Self-tuner inside

**Note4:** RS-232, TXD, RXD, RTS, CTS, GND, DCD, DTR, DSR, RI

**Note5:** RS-422, TXD+, TXD-, RXD+, RXD-

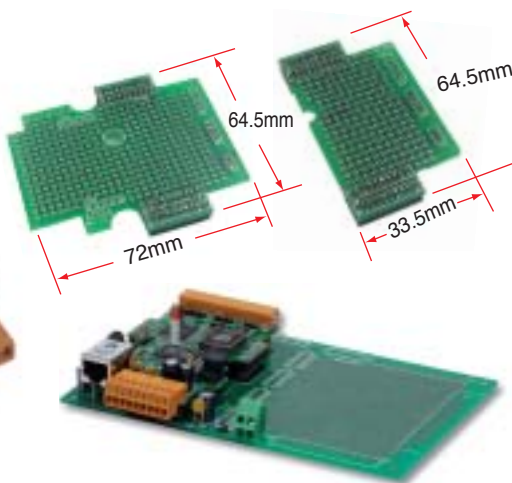
## Ordering Information

- **I-7188E1:** Internet Communication Controller
- **I-7188E1D:** I-7188E1 with seven-segment display
- **I-7188E2:** Internet Communication Controller
- **I-7188E2D:** I-7188E2 with seven-segment display
- **I-7188E3:** Internet Communication Controller
- **I-7188E3D:** I-7188E3 with seven-segment display
- **I-7188E3-232:** Internet Communication Controller
- **I-7188E3D-232:** I-7188E3-232 with display
- **I-7188E4:** Internet Communication Controller
- **I-7188E4D:** I-7188E4 with seven-segment display
- **I-7188E5:** Internet Communication Controller
- **I-7188E5D:** I-7188E5 with display
- **I-7188E5-485:** Internet Communication Controller
- **I-7188E5D-485:** I-7188E5-485 with display
- **I-7188E8:** Internet Communication Controller
- **I-7188E8D:** I-7188E8 with display

## Options

- **PWR-24/110:**  
Wall-plug Power Adaptor/  
110VAC, 60Hz, 3.6W
- **PWR-24/220:**  
Wall-plug Power Adaptor/  
220VAC, 50Hz, 3.6W
- **PWR-24/230:**  
Wall-plug Power Adaptor/  
230VAC, 50Hz, 3.6W

# 0 SERIES



## Introduction

## I/O Expansion Bus and Expansion Boards

I-7188XA, I-7188XB, I-7188XC, and I-7188EX support an I/O expansion bus. The I/O expansion bus can be used to implement various I/O functions such as D/I, D/O, A/D, D/A, Timer/Counter, UART, flash memory, battery backup SRAM, AsicKey & other I/O functions. Nearly all kinds of I/O functions can be implemented by this bus. The user can choose our I/O expansion boards or design their own I/O expansion boards. If the user chooses a small size I/O expansion board, then they can mount this I/O expansion board directly onto the I-7188XC controller. Customized I/O Expansion Boards can be ordered through ODM project.

## Pin-Assignment of I/O Expansion Bus

[illegible]

# 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	**Without Case**		—	—	XC/XA/XB/ EX/EG/XG
		7	7			
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) ** Without Case **	115.2kbps	XA/XC
X501	RS-232	—	—	One channel (5-wire)	115.2kbps	XC
X502	RS-232	—	—	One channel (3-wire), 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), 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 (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), and EEPROM: 128K*2 bytes	115.2kbps	XB/EX/XG/EG
X510-128	RS-232	5	5	One channel (3-wire), and EEPROM: 128K bytes	115.2kbps	XB/EX/XG/EG
X511	RS-485	—	—	Three channels (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), and 8M bytes NAND Flash ** Without Case **	115.2kbps	XA/XC/XB/EX/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/O Board

**X107** (64mm x 37mm)



#### Specifications:

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

### D/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)

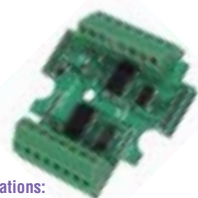


#### Specifications:

- 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/O Board

**X119** (72mm x 57mm)



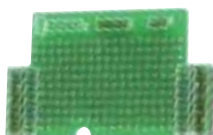
#### Specifications:

- 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;  
RI4, 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)



#### 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

*Available soon*

### 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

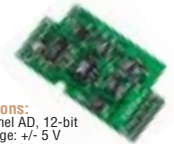


### AD, DA Board

**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



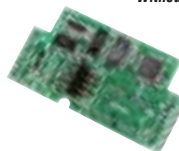
### RS-232 Board

**X500** (64mm x 38mm)

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

#### Specifications:

- COM: RS-232 port; RI4, 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)



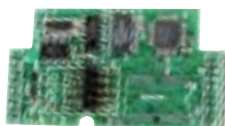
**Specifications:**

- 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**  
**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

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



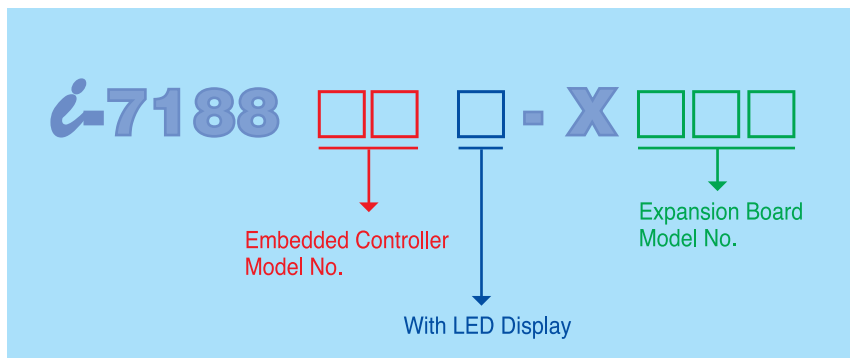
**Specifications:**

- 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