i-7188 *Embedded Controller*
SERIES

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

Operating Temp.:
-25°~+75°C

Introduction

The I-7188 series controllers are designed for embedded systems that require high reliability, PC-compatibility, 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 the first generation product and I-7188XA, I-7188XB and I-7188XC are the 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 I/O expansion bus.

I/O Expansion Bus and Expansion Board

The I-7188XA, I-7188XB and I-7188XC support 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 in this bus. Our I/O expansion boards offer features in addition to those provided by 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 expanison bus supports one expansion board.

i-7188 *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	20.2752 MHz(Note4)
SRAM	256K	512K	256K *(can be up to 512K for OEM version, see Note1)	128K
Battery backup SRAM Board (128K Bytes or 512K Bytes)	No	**X607:** 128K Bytes memory expansion board **X608:** 512K Bytes memory expansion board	**X607:** 128K Bytes memory expansion board **X608:** 512K Bytes memory expansion board	**X607:** 128K Bytes memory expansion board **X608:** 512K Bytes memory expansion board
Flash	256K/512K	512K	512K	256K (can be up to 512K for OEM version; see Note1)
COM Port	4	4	2 (Note3)	2
Program download	Yes, COM4	Yes, COM4	Yes, COM1	Yes, COM1
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 ne available, Note1)
EPROM	2K bytes	2K bytes	2K bytes (Can be up to 32 Bytes for OEMcustomers)	2K bytes (Can be up to 32 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	1	3 channels
D/O (150mA, 30V)	No	2 channels	1	3 channels
Support 64-bit hardware unique serial number	No	Yes	Yes	No (Note4)
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 DI/O.
Note3: COM1 can be used as 5-wire RS-232 port or 2-wire RS-485 port
Note4: will be upgraded

*i-*7188 *Embedded Controller* SERIES

Features

- AMD 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
- BIOS support RTC time & date
- 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: Am188™ ES, 40MHz
- SRAM: 256K bytes
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232 or RS-485
- COM2: RS-485
- COM3: RS-232
- COM4: RS-232
- 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

Features

- 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

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
- **X602:**
  16 mega bytes Flash memory board
- **X603:**
  32 mega bytes Flash memory board
- **X607:**
  128K bytes SRAM board
- **X608:**
  512K bytes SRAM board

Specifications

- CPU: Am188™ ES, 40MHz
- SRAM: 512K bytes
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232 or RS-485 Jumper Select
- COM2: RS-485
- COM3: RS-232
- COM4: RS-232
- 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

Features

- 64-bit hardware unique serial number inside
- User defined D/I/O
- COM driver support interrupt & 1K QUEUE input 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

Ordering Information

- **I-7188XB:**
  Embedded Controller
- **I-7188XBD:**
  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
- **X602:**
  16 mega bytes Flash memory board
- **X603:**
  32 mega bytes Flash memory board
- **X607:**
  128K bytes SRAM board
- **X608:**
  512K bytes SRAM board

Specifications

- CPU: Am188™ ES, 40MHz
- SRAM: 256K bytes
- Flash Memory: 512K bytes
- NVSRAM: 31 bytes
- EEPROM: 2048 bytes
- Real Time Clock
- COM1: RS-232/RS-485
- COM2: RS-485
- Digital Input channel: 1
- Digital Output channel: 1
- User defined I/O pins: X1~X14
- 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-*7188XC *Expandable Embedded Controller*
SERIES

Features

- AMD's 80188-20 embedded CPU (will be ugpraded to 40MHz)
- Cost-effective version of I-7188 series
- User defined D/I/O
- COM driver support interrupt & 1K QUEUE input 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
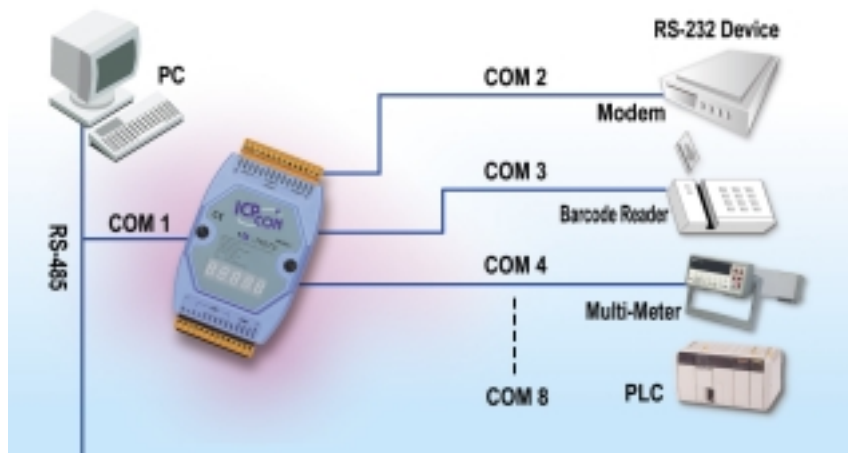- Built-in ICP DAS's MiniOS7
- Program download port: COM1

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
- **X602:**
  16 mega bytes Flash memory board
- **X603:**
  32 mega bytes Flash memory board
- **X607:**
  128K bytes SRAM board
- **X608:**
  512K bytes SRAM board

Specifications

- CPU: Am188-20 or compatible
- SRAM: 128K bytes
- Flash Memory: 256K bytes
- EEPROM: 2048 bytes
- COM1: RS-232/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: 150mA
- 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

i-752N SERIES
Intelligent Communication Controller

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. 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 by single RS-485 network. The RS-485 is famous for it's easy maintenance, simple cabling, reliable and low cost. When the user wants to connect RS-232 devices to 10BASE T, our I-7188EN series products can meet this demand.

Can used as 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 converter is Slave-type and can't work stand alone without host-PC. In real industrial application, the demand is different case by case and customers are not satisfied with Slave-type. The I-752N is very powerful and can analyse the local RS-232 device, D/I or D/O without 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. Out Intelligent Communication Controllers allow those devices to become connected to the RS-485 network.

i-752N SERIES
Intelligent Communication Controller

Features

- The COM1 or 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
- The COM1 can be used to downolad program.
- 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 devices
- 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: 128K bytes for I-7521/7522/7523
          256K bytes for I-7522A/7524/7527
- Flash ROM: 256K bytes for I-7521/7522/7523
              512K bytes for I-7522A/7524/7527
- EEPROM: 2048 bytes
- Communication speed: 115.2K BPS max.
- RS-232 interface connector: Male DB-9
- 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: 150mA/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 SERIES *Intelligent Communication Controller*

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	128K	128K	256K	128K	256K	256K
Flash	256K	512K	512K	256K	512K	512K
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 (Note2)
COM2 Port	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)	RS-485 (Note3)
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	2	1	1
D/I	3	3	5	–	1	1
user Defined I/O	3	–	–	–	–	–
Real Timer Clock	–	–	Y	–	Y	Y
Embedded O.S.	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7	MiniOS7

Note1: RS-232/RS-485
RS-485: D2+, D2-; Self-tuner inside
RS-232: TXD, RXD, RTS, CTS, GND
DB-9 male connector

Note2: RS-232/RS-485
RS-485: D1+, D1-; Self-tuner inside
RS-232: TXD, RXD, RTS, CTS, GND

Note3: RS-485 (D2+, D2-; Self-tuner inside); 3000V isolation
Note4: RS-232 (TXD, RXD, RTS, CTS, GND)
Note5: RS-232 (TXD, RXD, GND)
Note6: RS-422 (RXD3+, RXD3-, TXD3+, TXD3-, 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

I-7188EX/I-7188EXD

Why! Ethernet Solutions

"Embedded Internet" and "Embedded Ethernet" are hot topics today. Nowadays the Ethernet protocol becomes the de-facto standard for local area network. Via Internet, connectivity is occurring everywhere, from home appliances to vending machines to testing equipment to UPS...etc. Many embedded designers now face dilemma of adding Ethernet interface 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 network. With Ethernet, the network is always available. Using Ethernet for network in industrial area is appealing because the required cabling is already installed.

Introduction

The I-7188EX is powered by 80188-40 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 megabytes to 64 megabytes. 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.

i-7188EX SERIES
Embedded Internet/Ethernet Controller

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
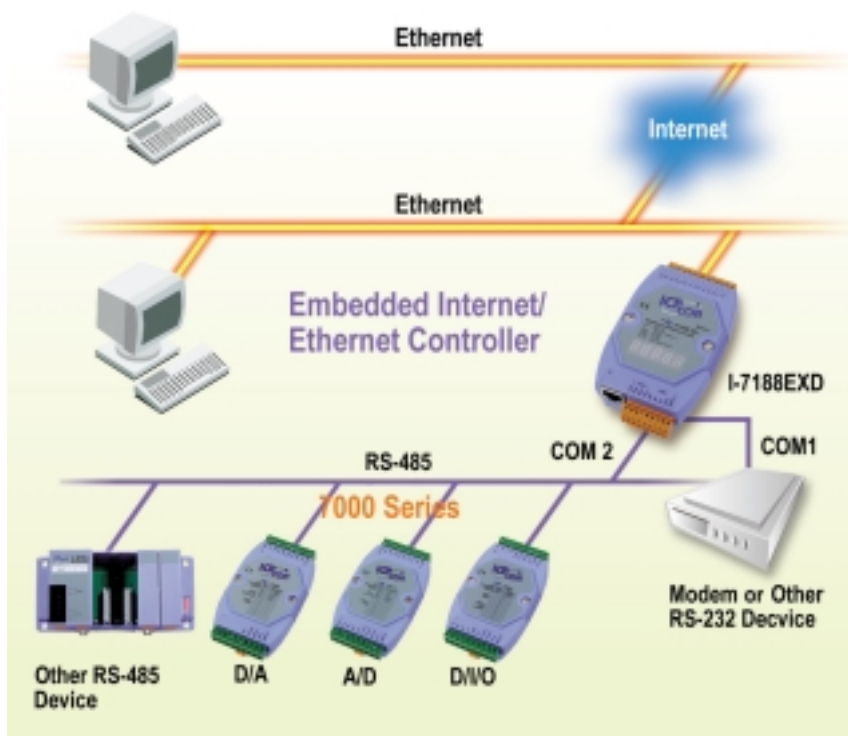- RARP, Reverse Address Resolution Protocol

Features

- AMD 80188-40 embedded CPU
- Supports a variety of TCP/IP features, including TCP, UDP, IP, ICMP, ARP, RARP
- 10BASE-T NE2000 compatible Ethernet Controller
- Reloadable Operating Software
- Remote Configuration, Diagnostics
- 64-bit hardware unique serial number inside
- COM driver support interrupt & 1K QUEUE input 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 or Ethernet Port (Available soon)

Specifications of I-7188EX & I-7188EXD

- CPU: Am188™ ES, 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-7188EX; 3.0W for I-7188EXD
- Dimensions: 123mm x 72mm x 33mm

i-7188EX *Embedded Internet/Ethernet Controller* SERIES

Ordering Information

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

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.
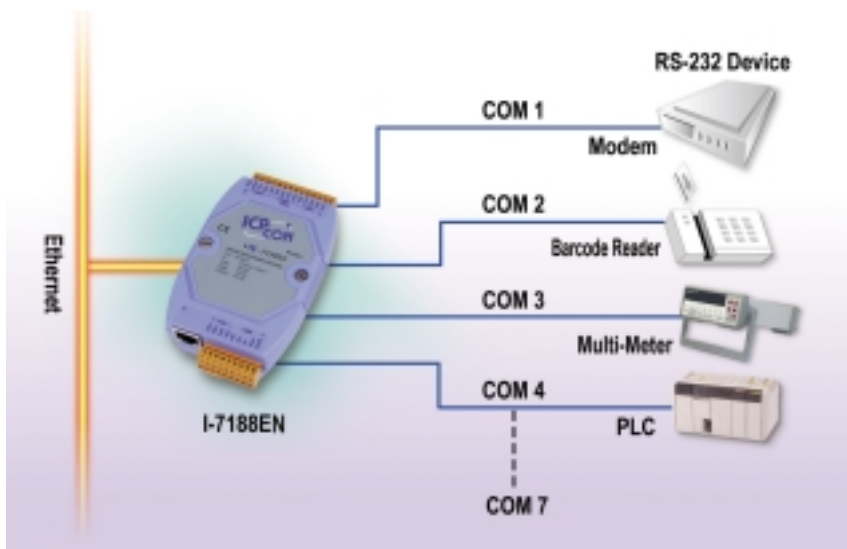
Features

- AMD's 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

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

Specifications

of I-7188EA & I-7188EAD

- CPU: Am188™ ES, 40MHz
- 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 Colock
- 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-7188EN SERIES
Internet Communication Controller

Introduction

The I-7188EX, Embedded Internet/Ethernet Controller, focuses in embedded control applications while the I-7188EN, Internet Communication Controller, focuses in communication applications. and application 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 optimal product. Now we offer wide range Internet Communication Controllers, such as I-7188E1/E2/E3/E4/E5/E8. Except the RTC circuitry, the basic hardware of I-7188EN is similar to I-7188EX. Since there are too many Configurations for I-7188EN series product, OEM or ODM version is welcomed.

Features

■ AMD's 80188-40 embedded CPU
■ Supports a variety of TCP/IP features, including TCP, UDP, IP, ICMP, ARP, RARP
■ 10BASE-T NE2000 compatible Ethernet Controller
■ Reloadable Operating Software
■ Remote Configuration; Diagnostics
■ 64-bit hardware unique serial number inside
■ COM driver support interrupt & 1K QUEUE input buffer
■ Support serial port
■ Built-in NVRAM, EEPROM

i-7188EN SERIES
Internet Communication Controller

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 serveral DI/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-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 or Ethernet Port (Available soon)

Specifications

- CPU: Am188™ ES, 40MHz
- SRAM: 256K bytes
- Flash Memory: 256K bytes
- EEPROM: 2048 bytes.
- Ethernet port: 10Base-T
- R.O.C. Invention Patent No. 086674, No. 103060, No. 132457
- RS-485 interface connector for I-7524/7527: 14-pin screw terminal block (accepts 16~22 AWG wires); 3.5mm pitch
- D/I: 3.5V~30V
- D/O: 150mA/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 SERIES
Internet Communication Controller

Internet Communication Controller — Selection Guide

Model Number	I-7188E1	I-7188E2	I-7188E3	I-7188E4	I-7188E5	I-7188E8
CPU (80188)	40M	40M	40M	40M	40M	40M
SRAM	256K	256K	256K	256K	256K	256K
Flash	256K	256K	256K	256K	256K	256K
Ethernet Port	10 BaseT	10 BaseT	10 BaseT	10 BaseT	10 BaseT	10 BaseT
COM1 Port Program Download	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)
COM3 Port	–	–	RS-422 (Note5)	RS-232 (Note2)	RS-232 (Note1)	RS-232 (Note2)
COM4 Port	–	–	–	RS-232 (Note4)	RS-232 (Note1)	RS-232 (Note2)
COM5 Port	–	–	–	–	RS-232 (Note1)	RS-232 (Note2)
COM6 Port	–	–	–	–	–	RS-232 (Note2)
COM7 Port	–	–	–	–	–	RS-232 (Note2)
COM8 Port	–	–	–	–	–	RS-232 (Note2)
D/O	–	–	4	–	–	–
D/I	–	–	4	–	–	–
RTC	N	N	N	N	N	N
Embedded O.S.	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-7188E4:** Internet Communication Controller
- **I-7188E4D:** I-7188E4 with seven-segment display
- **I-7188E5:** Internet Communication Controller
- **I-7188E5D:** I-7188E5 with display
- **I-7188E8:** Internet Communication Controller
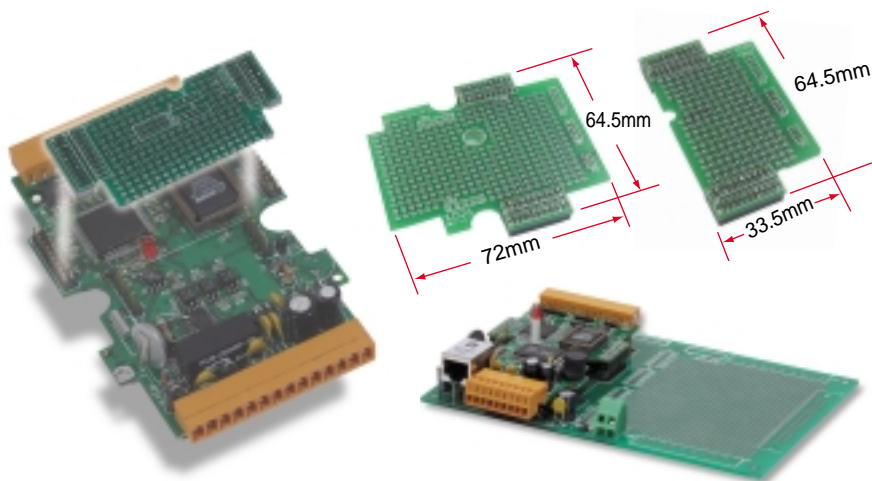- **I-7188E8D:** I-7188E8 with display

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

i-7188 SERIES
I/O Expansion Boards

64.5mm
64.5mm
72mm
33.5mm

Introduction

I/O Expansion Bus and Expansion Boards

I-7188XA, I-7188XB, I-7188XC, and I-7188EX support 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 in this bus. The user can choose our I/O expansion boards or design his I/O expansion boards. If the user chooses small size I/O expansion board, then he can mount directly this I/O expansion board on I-7188 controller. Customized I/O Expansion Boards can be ordered by ODM project.

Pin-Assignment of I/O Expansion Bus

J1

Left	Pin		Pin	Right
GND	1		2	GND
CLROUTA	3		4	ARDY
INTO	5		6	INT 1
VCC	7		8	RESET
GND	9		10	RESET\
TO 0	11		12	TO 1
TI 0	13		14	TI 1
SCLK	15		16	DIO9
DIO4	17		18	DIO14
VCC	19		20	VCC

CON20A
JDIP20P

J2

Left	Pin		Pin	Right
MAO	1		2	AD0
MA1	3		4	AD1
MA2	5		6	AD2
MA3	7		8	AD3
MA4	9		10	AD4
MA5	11		12	AD5
MA6	13		14	AD6
MA7	15		16	AD7
INT3	17		18	WRITE1
CS\	19		20	READ1

CON20A
JDIP20P

i-7188 SERIES

I/O Expansion Boards

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 Board (Small size)	64mm x 32mm	XA/XC
X001	prototype Board (Large size)	64mm x 70mm	XA/XC
X002	Prototype Board	114mm x 170mm	XA/XB/XC/EX
X003	Self-test board for 7188XC	64mm x 32mm	XC
X004	Slf-test board for 7188XA/XB	64mm x 36mm	XB
X005	Prototype Board (Small size)	38mm x 64mm	XB/EX
X006	Prototype Board (Large size)	72mm x 65mm	XB/EX

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

Model	Description	D/I	D/O	Relay Output	Counter/Timer	Used with I-7188XA/XB/XC/EX
X100	DI/O expansion board	8 (Non-isolated)	–	–	–	XC
X101	DI/O expansion board	–	8 (Non-isolated)	–	–	XC
X102	Relay expansion board	–	–	2	–	XC
X103	DI/O expansion board	7 (Isolated)	–	–	–	XC
X104	DI/O expansion board	8 (Non-isolated) (each channel can be programmed to DI/Do)		–	–	XC
X105	DI/O expansion board	(8 channel can be programmed to DI/Do)		–	–	XC
X106	DI/O expansion board	can be used as 2 channels DO or 3 channels DI		–	–	XC
X107	DI/O expansion board	6	7	–	–	XB/EX
X400	Timer/Counter expansion board	–	–	–	3 channels 16-bit timer/counter	XC

I/O Expansion Board for A/D, D/A

Model	Description	A/D Channels	Input Range	A/D bits	D/A Channels	Output Range	D/A bits	Used with I-7188XA/XB/XC/EX
X200	A/D expansion board	1	0~2.5V	12 bit	–	–	–	XC
X300	D/A expansion board	–	–	–	2	0~4.095V	12 bit	XC
X301	A/D, D/A expansion board	1	0~2.5V	12 bit	1	0~4.095V	12 bit	XC
X302	A/D, D/A expansion board	1	±5V	12 bit	1	±5V	12 bit	XC
X303	A/D, D/A expansion board	1	±5V	12 bit	1	±5V	12 bit	XB/EX

I/O Expansion Board Selection Guide

I/O Expansion Boards for RS-232/422

Model	Description	RS-232/RS-422 Channels	Communication Speed	Used with I-7188XA/ XB/XC/EX
X500	RS-232 expansion board	1 (Can be used for Modem)	115.2K	XA/XC
X501	RS-232 expansion board	Support one channel 5-wire RS-232 (RTS, CTS, TXD, RXD, GND)	115.2K	XC
X502	RS-232 expansion board	Support one channel 5-wire RS-232 (RTS, CTS, TXD, RXD); one channel 2-wire RS-232 (RXD, TXD, GND)	115.2K	XC
X503	RS-232 expansion board	Support one channel 5-wire RS-232 (RTS, CTS, TXD, RXD, GND)	115.2K	XB/EX
X504	RS-232 expansion board	Support two channel RS-232; one 5-wire RS-232 (RTS, CTS, TXD, RXD, GND) and one 9-wire RS-232	115.2K	XB/EX
X505	RS-232 expansion board	Support three-channel 5-wire RS-232 (RTS, CTS, TXD, RXD, GND)	115.2K	XB/EX
X506	RS-232 expansion board	Support six-channel 3-wire RS-232	115.2K	XB/EX
X507	RS-422 expansion board	Support one channel RS-422, 4-channel D/I and 4-channel D/O	115.2K	XB/EX

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/XB/XC/EX
X601	Flash ROM Expansion Board	8M bytes NAND Flash	–	XA/XB/XC/EX
X602	Flash ROM Expansion Board	16M bytes NAND Flash	–	XA/XB/XC/EX
X603	Flash ROM Expansion Board	32M bytes NAND Flash	–	XA/XB/XC/EX
X607	Battery backup SRAM Board	–	128K Bytes	XA/XB/XC/EX
X608	Battery backup SRAM Board	–	512K Bytes	XA/XB/XC/EX

i-7188 SERIES
I/O Expansion Boards

Prototype Board
X000 (64mm x 32mm)

Self-test board for 7188XA/XB
X004 (64mm x 32mm); 0.2W

D/O Expansion Board
X101 (64mm x 32mm); 0.4W

Specifications:
- 8 D/O channels
- Type: TTL Level;
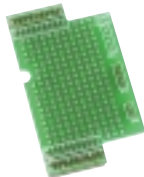 Sink current: 64mA
Note: Used with I-7188XC only

Prototype Board
X001 (64mm x 70mm)

Prototype Board
X005 (38mm x 64mm)

Note: Used with I-7188XB or I-7188EX
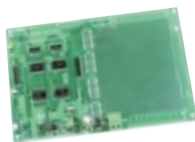
Relay Expansion Board
X102 (64mm x 32mm); 0.5W

Specifications:
- 2-channel relay output
- Contact rating;
  0.5A/125VAC; 1A/30VDC
Note: Used with I-7188XC only

Prototype Board
X002 (114mm x 170mm)

Prototype Board
X006 (72mm x 65mm)

Note: Used with I-7188XB or I-7188EX

D I/O Expansion Board
X103 (64mm x 32mm); 0.3W

Specifications:
- 7 isolated D/I channels
- Input voltage range: 3.5V~30V
Note: Used with I-7188XC only

Self-test Board for 7188XC
X003 (64mm x 32mm); 0.2W

DI/O Expansion Board
X100 (64mm x 32mm); 0.3W

Specifications:
- 8 D/I channels
- Input voltage range: 3.5V~30V
Note: Used with I-7188XC only

DI/O Expansion Board
X104 (64mm x 32mm); 0.2W

Specifications:
- 8 D/I channels
- Each channel can be
  programmed to D/I or D/O
- Non-isolated, TTL level
Note: Used with I-7188XC only

DI/O Expansion Board
X105 (64mm x 32mm); 0.4W

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

Note: Used with I-7188XC only

DI/O Expansion Board
X106 (64mm x 32mm); 0.3W

Specifications:
- 2-channel Open collector output; 30V/250mA or 3-channel D/I (3.5V~30V)

Note: Used with I-7188XC only

DI/O Expansion Board
X107 (64mm x 32mm); 0.3W

Specifications:
- 7-channel Open collector output; 30V/100mA
- 6-channel D/I (3.5V~30V)

Note: Used with I-7188XB or I-7188EX

A/D Expansion Board
X200 (64mm x 32mm); 0.3W

Specifications:
- One channel A/D
- Input Range: 0~2.5V, 12-bit

Note: Used with I-7188XC Only

D/A Expansion Board
X300 (64mm x 32mm); 0.3W

Specifications:
- Two channel D/A
- Output Range: 0~4.095V, 12-bit

Note: Used with I-7188XC only

A/D, D/A Expansion Board
X301 (64mm x 32mm); 0.5W

Specifications:
- One channel A/D, 12-bit Input Range: 0~2.5V
- One channel D/A, 12-bit Output Range: 0~4.095V

Note: Used with I-7188XC only

A/D, D/A Expansion Board
X302 (64mm x 32mm); 0.9W

Specifications:
- One channel A/D, 12-bit Input Range: ±5V
- One channel D/A, 12-bit Output Range: ±5V

Note: Used with I-7188XC only

A/D, D/A Expansion Board
X303 (64mm x 38mm); 0.9W

Specifications:
- One channel A/D, 12-bit Input Range: ±5V
- One channel D/A, 12-bit Output Range: ±5V
- I/O: Output/6 lines; Input/4 line

Note: Used with I-7188XC only

Timer/Counter Expansion Board
X400 (64mm x 32mm); 0.3W

Specifications:
- 3-channel 12-bit timer/counter

Note: Used with I-7188XC

RS-232 Expansion Board
X500 (64mm x 32mm); 0.4W

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

Note: Used with I-7188XA/XC

RS-232 Expansion Board
X501 (64mm x 32mm); 0.4W

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

Note: Used with I-7188XC only

RS-232 Expansion Board
X502 (64mm x 32mm); 0.6W

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

Note: Used with I-7188XC only

I/O Expansion Boards

RS-232 Expansion Board
X503 (64mm x 32mm); 0.6W

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

Note: Used with I-7188XB or I-7188EX only

RS-232 Expansion Board
X504 (64mm x 36mm); 0.7W

Specifications:
- COM3: RS-232 port; CTS3, RTS3, RXD3, TXD3
- COM4: RS-232 port; RI4, CTS4, RTS4, DSR4, DTR4, TXD4, RXD4, DCD4

Note: Used with I-7188XB or I-7188EX

RS-232 Expansion Board
X505 (64mm x 36mm); 0.7W

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

Note: Used with I-7188XB or I-7188EX

RS-422 Expansion Board
X507 (64mm x 36mm); 0.7W

Specifications:
- COM3: RS-422 port; RXD3+, RXD3-, TXD3+, TXD3-
- DI1~DI4
- DO1~DO4

Flash Memory Expansion Board
X600/X601/X602/X603 (64mm x 32mm)

Specifications:
- X600: 4M bytes NAND Flash; 0.3W
- X601: 8M bytes NAND Flash; 0.4W
- X602: 16M bytes HAND Flahs; 0.5W
- X603: 32M bytes HAND Flash; 0.6W

Battery Backup SRAM Board
X607 (64mm x 32mm); 0.5W

Specifications:
- SRAM: 128K Bytes

Battery Backup SRAM Board
X608 (64mm x 32mm); 0.6W

Specifications:
- SRAM: 512K Bytes

RS-232 Expansion Board
X506 (64mm x 36mm); 0.8W

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

Note: Used with I-7188XB or I-7188EX