FR-32P Modules

User's Manual

Warranty

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

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1. Introduction

The FR-32P has 32-channel isolated digital inputs with serial FRnet interface. Unlike traditional digital I/O board, each FRnet series I/O module has an FRnet interface which can let the module become a distributed remote I/O module. This interface is cable-saving and provides high-speed data transmission.

The FRnet IO modules can function as remote control modules in a field control system. After the address (or group number) of each module is set, the IO data are mapped to a memory space to ease the controller to do the monitoring and control. Users even do not feel that they are using remote IO modules.

The FRnet input modules can connect with the FRnet output modules through the twisted 2-wire bus without a CPU module to become a MagicWire application. We call it MagicWire because 128 DI can directly map to 128 DO through only 2-wire connection; and the maximum distance between modules can reach 400 meters. When using MagicWire mode, address must start from 0.

Communication between PC, PAC, PLC, and other controllers can be established via FRnet. For further information about the networking of the FRnet modules, please refer to related literatures on ICPDAS web site.

http://www.icpdas.com/products/Remote_IO/frnet/frnet_introduction.htm
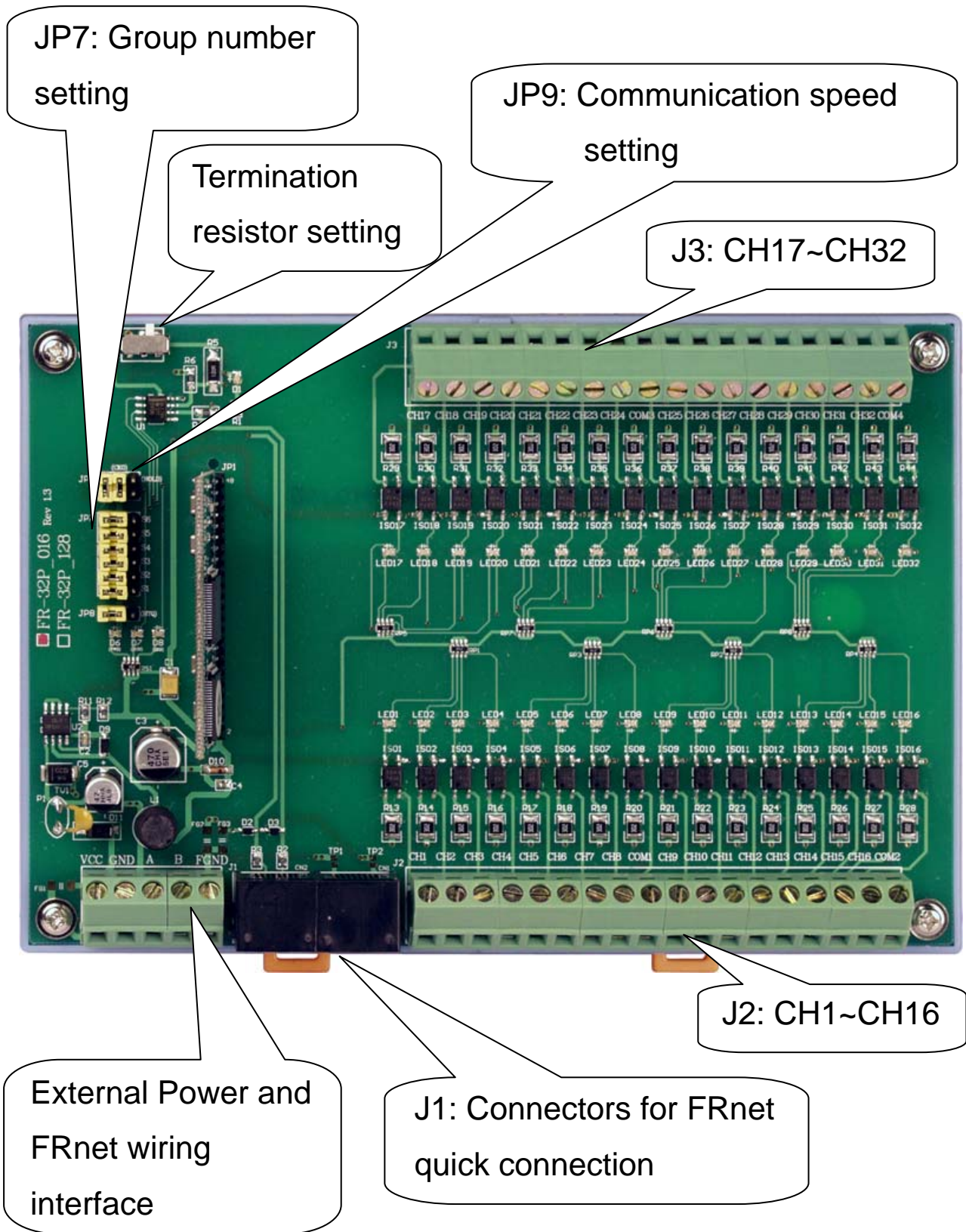
2. Specifications

Table 1. Specifications of FR-32P module.

Characteristics	Specifications
Transfer speed	250K / 1M bps
Scan time	2.88 ms
Transfer distance	400 / 100 meters max.
Number of input channels	32
Digital Input Logic Level	low : 0 ~ 1V
	high: 3.5 VDC ~ 30 VDC
Digital Input impedance	3K; 1/4W
Digital Input response time	1 KHz max
Power Supply Requirement	10~30V (standard:24V)
Power consumption	24V@75mA(max)
Operating temperature	-25°C～+75°C
Storage temperature	-30°C～+85°C
Operating Humidity	10%～90%, non-condensing
Storage Humidity	5%～95%, non-condensing
Dimensions	173mmX117mm

3. Hardware description
3.1. Appearance of FR-32P

JP7: Group number setting

Termination resistor setting

JP9: Communication speed setting

J3: CH17~CH32

External Power and FRnet wiring interface

J1: Connectors for FRnet quick connection
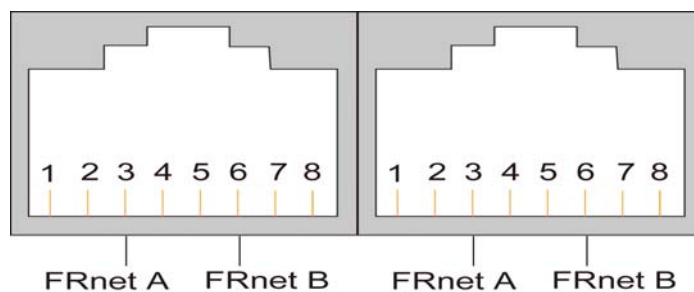
J2: CH1~CH16

3.2. Pin Assignment

■ External Power supply and signals connection
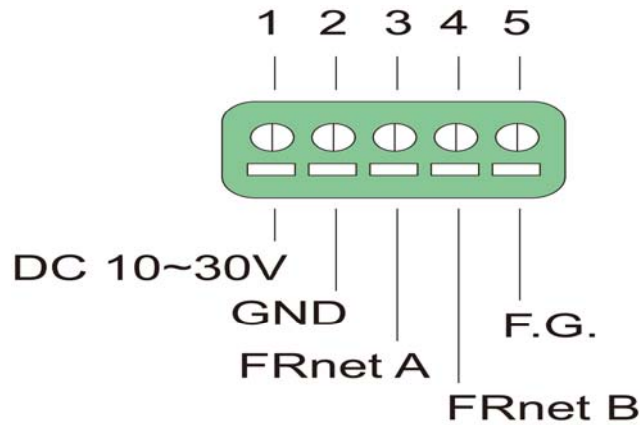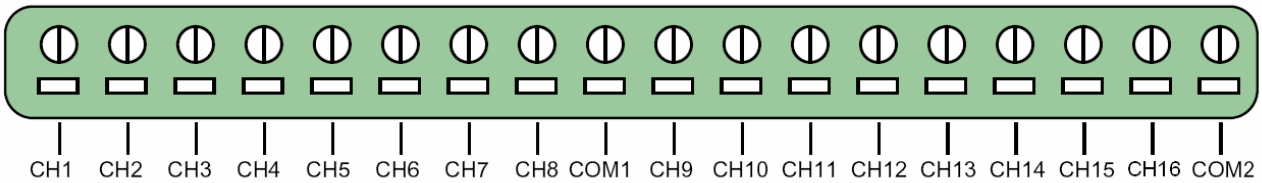

■ Additional FRnet signal connectors

All **FRnet A** signals are internally connected together, and all **FRnet B** signals are connected together, too. Following two connectors are used for FRnet quick connection.
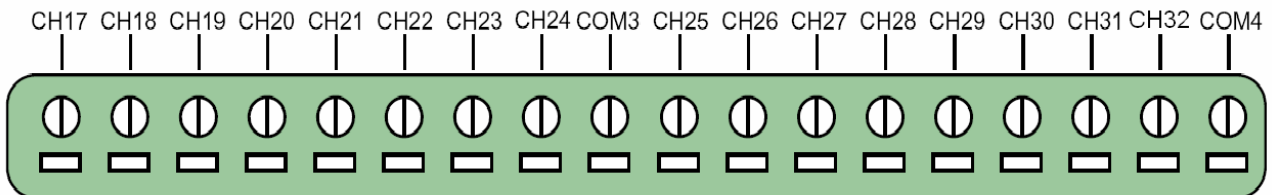
J1:

■ I/O connectors

J2:

CH1 CH2 CH3 CH4 CH5 CH6 CH7 CH8 COM1 CH9 CH10 CH11 CH12 CH13 CH14 CH15 CH16 COM2

J3:

CH17 CH18 CH19 CH20 CH21 CH22 CH23 CH24 COM3 CH25 CH26 CH27 CH28 CH29 CH30 CH31 CH32 COM4

3.3. Interface Circuit

The input channels can be separated into 4 groups. Either sinking or sourcing type digital input can be applied on either one group. The first 8 channels use COM1, the second 8 channels use COM2, the third 8 channels use COM3, and the last 8 channels use COM4. Do not mix the sinking and the sourcing digital inputs together on the same group. The interface circuit is shown in the following diagram.
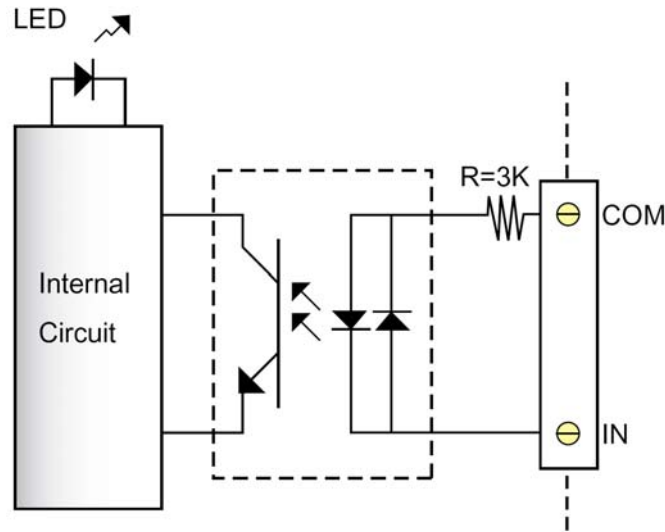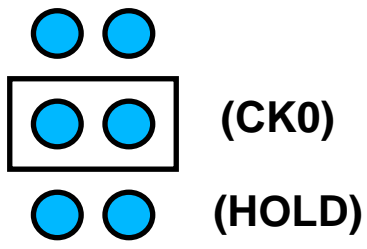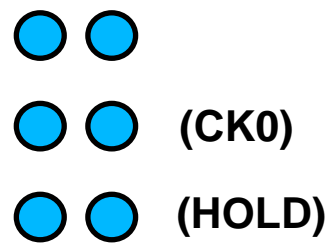
3.4. Address (Group number) Setting

For 16-group FRnet system, please ignore S4, S5, and S6.
Following diagram shows the possible group number (address)
settings. Each setting contains two consecutive groups.
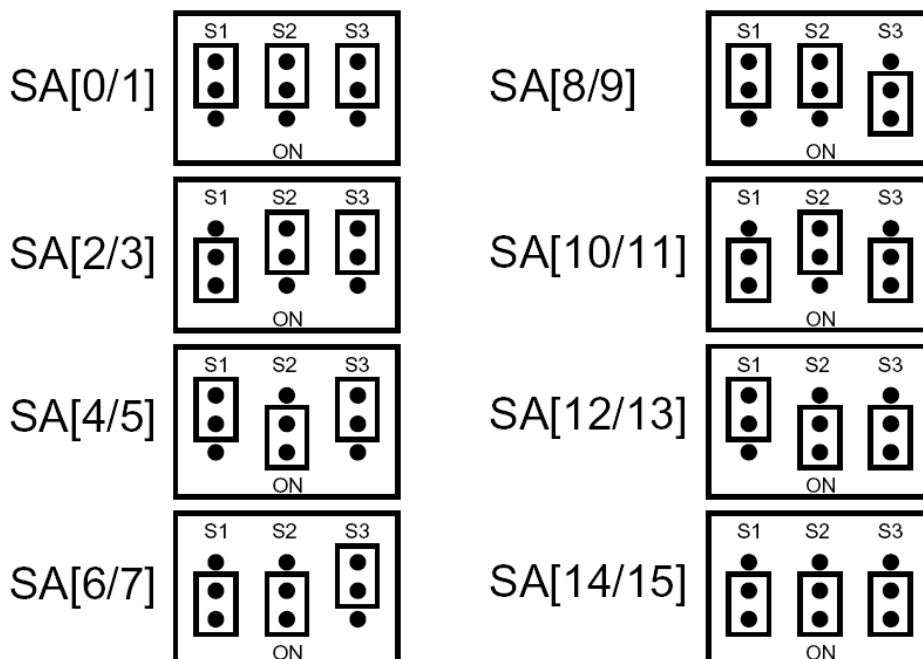
3.5. Communication Speed Setting

The settings for 250K bps and 1M bps communication rates are listed as follows.

Speed	250K bps	1M bps
JP9 Setting	(CK0) (HOLD)	(CK0) (HOLD)

3.6. LED Indicators

There are several LED indicators located on the module. They are one Power LED, one Communication Run LED, one Error LED, 32 DI status LEDs, and one termination resistor LED. Each LED indicator has a label expressing its function. Note that the Communication Run LED and the Error LED indicate the quality of the communication. When FRnet is running normally, the Communication Run LED will flash at a rate about 1Hz. The Error LED will be lit if communication error is happened.