FR-32R 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-32R has 32-channel relay outputs 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 (at 250Kbps communication rate). 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

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2. Specifications

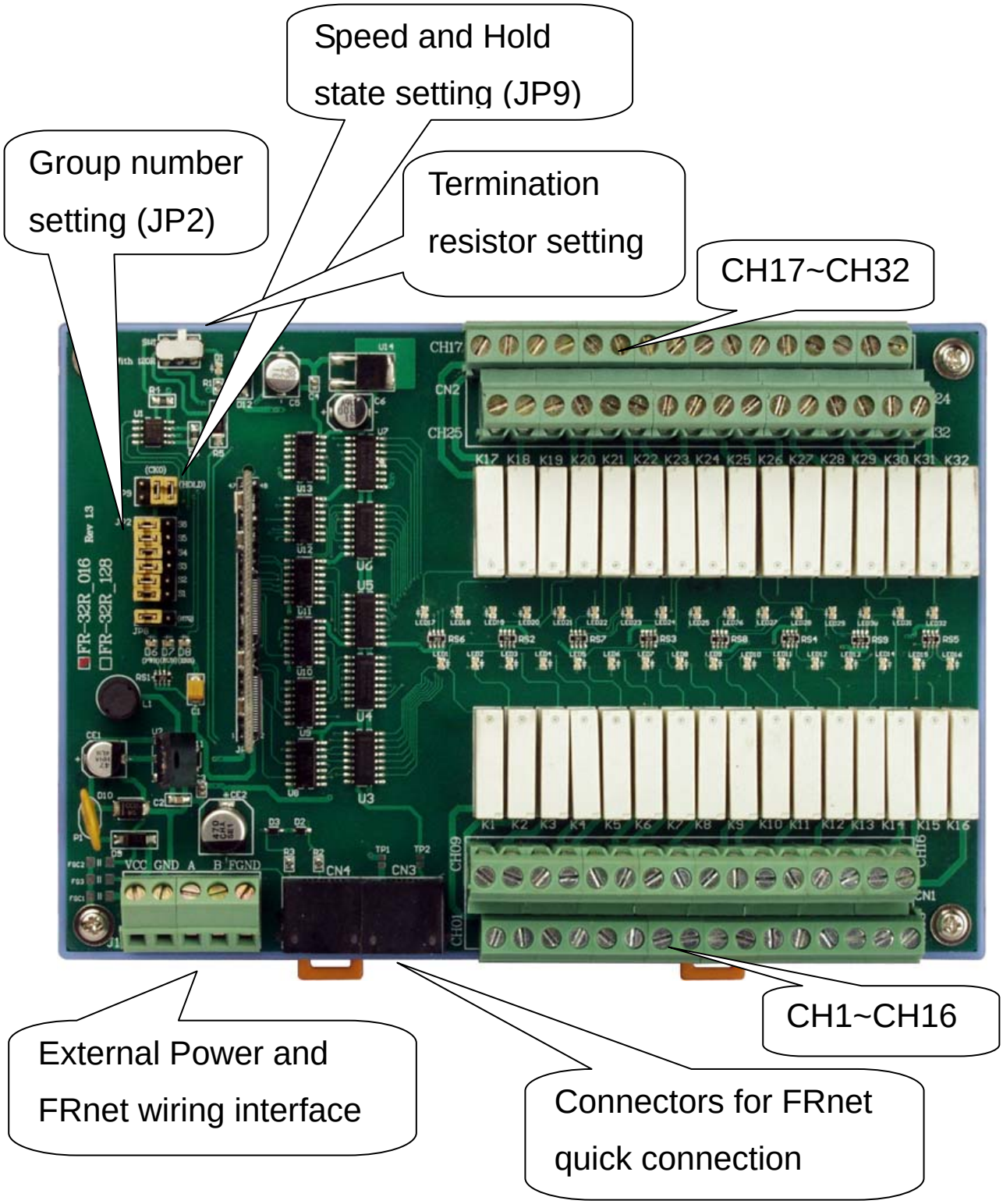
Table 1. Specifications of FR-32R module

Characteristics	Specifications
Transfer speed	250Kbps
Scan time	2.88 ms
Transfer distance	400m max.
Number of channels	32
Relay Type	Form A, SPST
Nominal load	3A/125Vdc, 3A/270Vac
Max switching power	1250VA, 150W
Max switching voltage	125Vdc, 270Vac
Max switching current	5A
Life expectancy	100,000 operations min. at full load 20,000,000 operations min. at no load
Release time	5 ms
Control logic	TTL low, Relay on
Power Requirement	10~30V (standard:24V)
Power Consumption	24V@240mA (max)
Operating temperature	-25°C～+75°C
Storage temperature	-30°C～+85°C
Operation Humidity	10%～90%, non-condensing
Storage Humidity	5%～95%, non-condensing
Dimensions	173mmX117mm

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3. Hardware description

3.1. Appearance of FR-32R

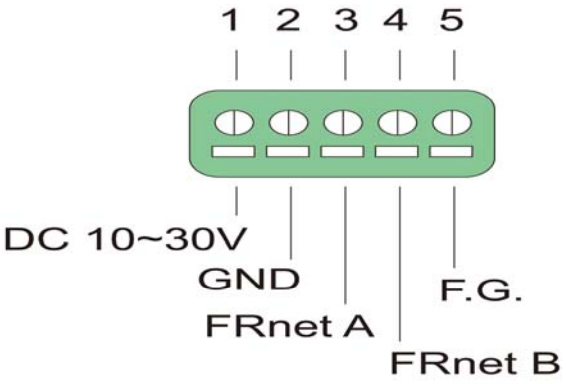


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3.2. Pin Assignment

■ External Power supply and signals connection

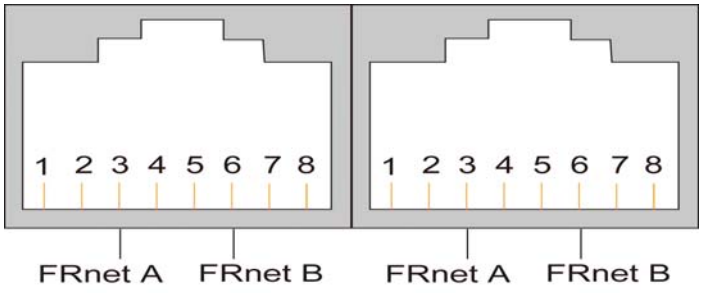
J1:



■ 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.

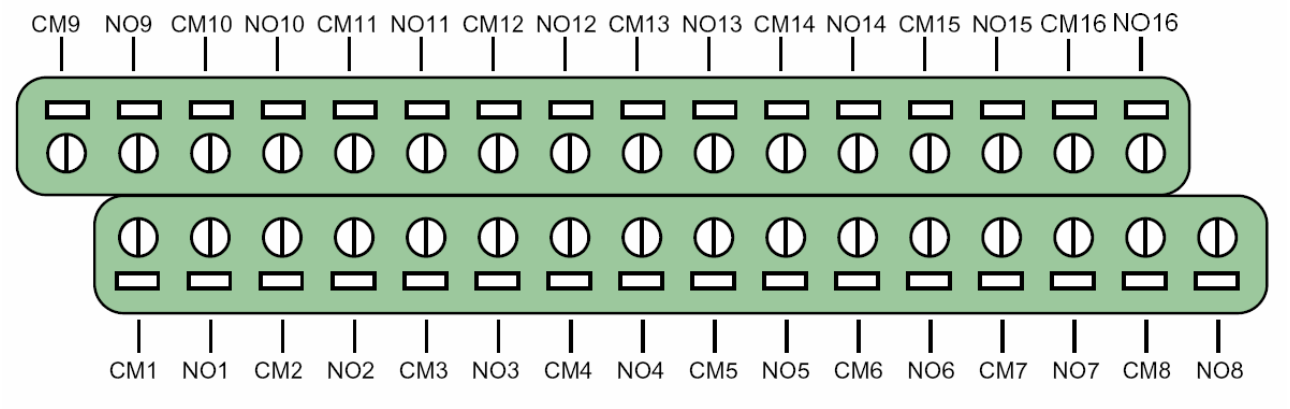
CN3/CN4



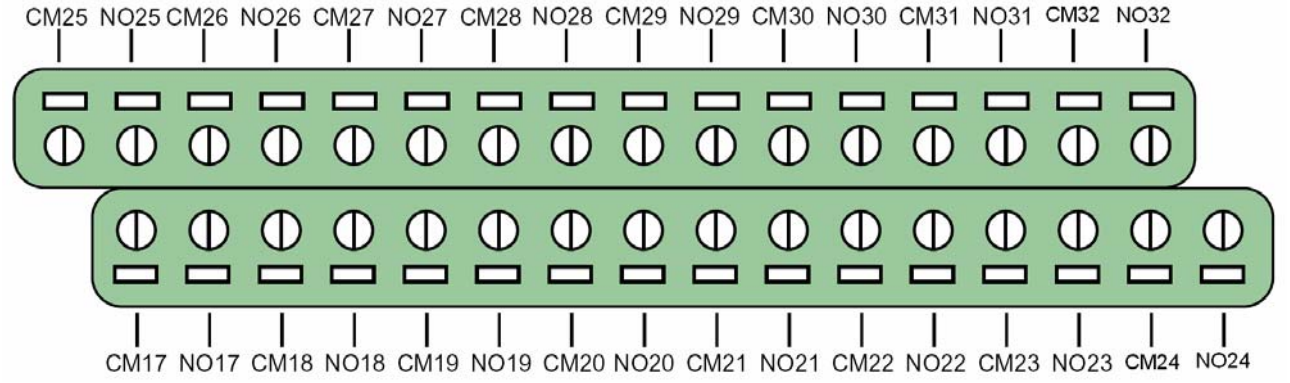
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■ I/O connectors

CN1:



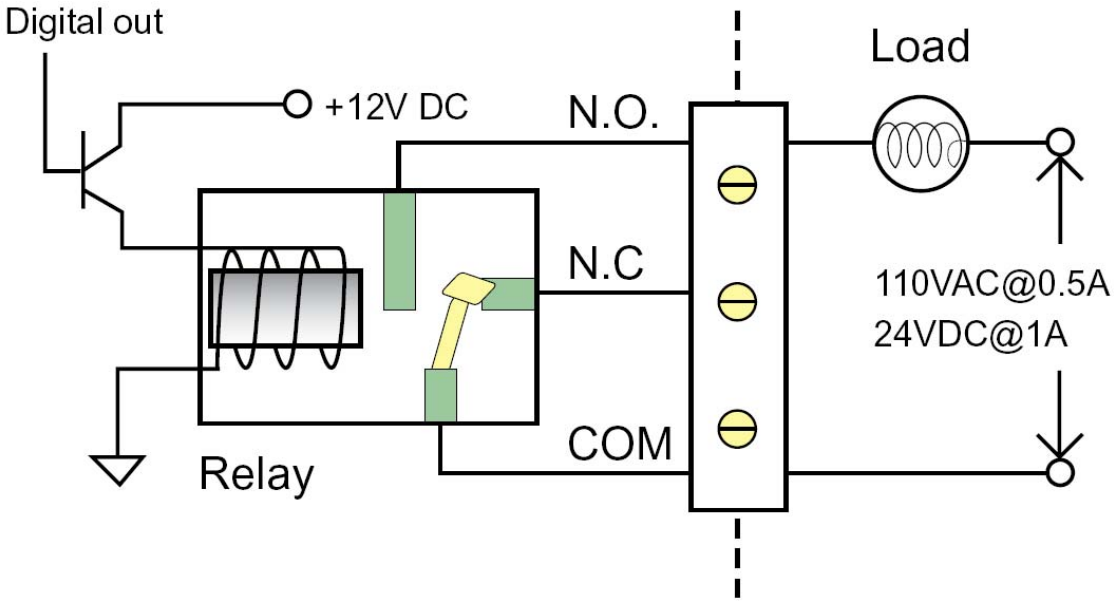
CN2:



The CMnn and NOnn in these figures represent the COM and the N.O. pins of channel nn, respectively.

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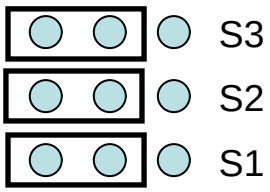
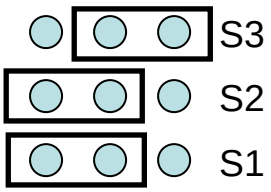
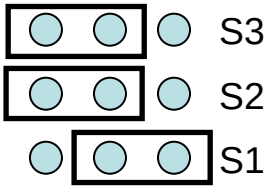
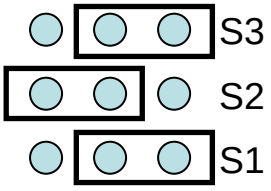
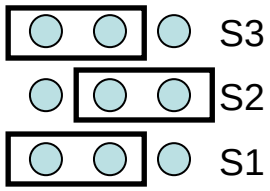
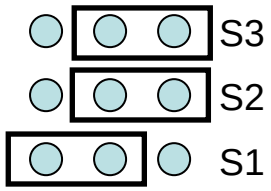
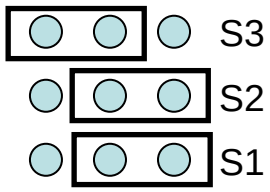
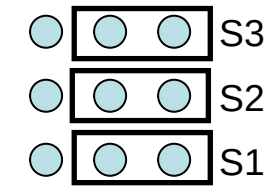
3.3. Interface Circuit



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3.4. Address (Group number) Setting

The group number setting table for 16-group system is shown as follows. Each setting includes two consecutive group numbers. S4, S5, and S6 are used for 128-group system. Although the settings for 128-group system are omitted here, they are similar to other jumpers that construct a binary code for address.

RA0 + RA1		**RA8 + RA9**	
RA2 + RA3		**RA10 + RA11**	
RA4 + RA5		**RA12 + RA13**	
RA6 + RA7		**RA14 + RA15**	

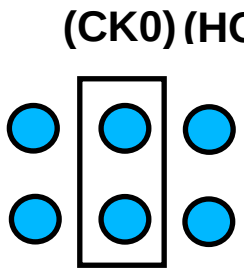
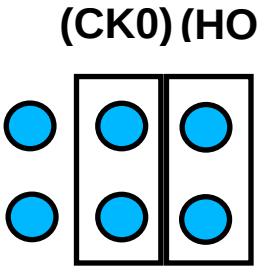
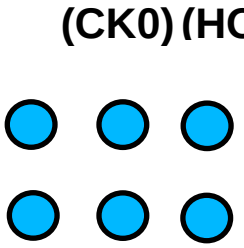
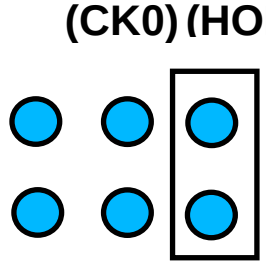
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3.5. Communication Speed Setting

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

The settings for 250K bps and 1M bps communication rates are listed in the following table. The standard speed (250K bps) is set by having a jumper at CK0 position.

In the following table, the jumper at HOLD position determines what kind of the output status will be when the communication error happens.

JP9	output hold	output reset
250K bps		
1M bps		

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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 output 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.

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