

5409 Digital Output Module

Installation, Operation and Maintenance
Setup Manual

5/19/2011



The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof. Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed. Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

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Safety Information

Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.

WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate.

CAUTION

CAUTION used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** equipment damage..

PLEASE NOTE

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction and operation of electrical equipment and the installation, and has received safety training to recognize and avoid the hazards involved.

BEFORE YOU BEGIN

Do not use this product on machinery lacking effective point-of-operation guarding. Lack of effective point-of-operation guarding on a machine can result in serious injury to the operator of that machine.

 CAUTION**EQUIPMENT OPERATION HAZARD**

Verify that all installation and set up procedures have been completed.

Before operational tests are performed, remove all blocks or other temporary holding means used for shipment from all component devices.

Remove tools, meters, and debris from equipment.

Failure to follow these instructions can result in injury or equipment damage.

Follow all start-up tests recommended in the equipment documentation. Store all equipment documentation for future references.

Software testing must be done in both simulated and real environments.

Verify that the completed system is free from all short circuits and grounds, except those grounds installed according to local regulations (according to the National Electrical Code in the U.S.A, for instance). If high-potential voltage testing is necessary, follow recommendations in equipment documentation to prevent accidental equipment damage.

Before energizing equipment:

- Remove tools, meters, and debris from equipment.
- Close the equipment enclosure door.
- Remove ground from incoming power lines.
- Perform all start-up tests recommended by the manufacturer.

OPERATION AND ADJUSTMENTS

The following precautions are from the NEMA Standards Publication ICS 7.1-1995 (English version prevails):

- Regardless of the care exercised in the design and manufacture of equipment or in the selection and ratings of components, there are hazards that can be encountered if such equipment is improperly operated.
- It is sometimes possible to misadjust the equipment and thus produce unsatisfactory or unsafe operation. Always use the manufacturer's instructions as a guide for functional adjustments. Personnel who have access to these adjustments should be familiar with the equipment manufacturer's instructions and the machinery used with the electrical equipment.
- Only those operational adjustments actually required by the operator should be accessible to the operator. Access to other controls should be restricted to prevent unauthorized changes in operating characteristics.

About The Book

At a Glance

Document Scope

This manual describes the operation and maintenance of the 5409 FET Digital Output module.

Validity Notes

This document is valid for all versions of the 5409 FET Digital Output module.

Product Related Information

WARNING

UNINTENDED EQUIPMENT OPERATION

The application of this product requires expertise in the design and programming of control systems. Only persons with such expertise should be allowed to program, install, alter and apply this product.

Follow all local and national safety codes and standards.

Failure to follow these instructions can result in death, serious injury or equipment damage.

User Comments

We welcome your comments about this document. You can reach us by e-mail at technicalsupport@controlmicrosystems.com.

Overview

The model 5409 Digital Output module adds eight FET outputs to a 5000 Series input/output system. Up to eight Model 5409 modules may be installed on the I/O bus, for a total of 64 FET discrete outputs per bus. These outputs control panel lamps, relays, solenoid valves, and other on/off devices that require 12 to 24 VDC at moderate load currents.

The FET digital outputs are optically isolated from the logic power. To simplify field wiring, the outputs are grouped with a common return. Counter emf protection diodes across the loads allow operation with inductive loads.

Eight light emitting diodes on the model 5409 show the status of each of the outputs. The SCADAPack controller module enables or disables the LEDs to control power consumption in solar powered or unattended applications.

A ninth LED shows the status of the DC power supply to the FET outputs. It illuminates if DC power is present. If the DC power is externally fused, it helps detect a blown fuse.

Installation

The installation of the 5409 module requires mounting the module on the 7.5mm by 35mm DIN rail and connecting the modules to the system I/O Bus. Refer to the **System Configuration Guide**, at the beginning of this manual, for complete information on system layout, I/O Bus cable routing and module installation.

Field Wiring

The 5409 module provides DC outputs. The DC+ supply is switched to the eight outputs. It is externally wired to the module. Individual loads are wired to the terminals 0 through 7 (see **Figure 1: Typical Field Wiring**).

The DC- supply is connected to the DC- input and to the common return for the loads.

Controller, modem and I/O modules use screw termination style connectors for termination of field wiring. They accommodate solid or stranded wires from 22 to 12 AWG.

The connectors are removable. This allows module replacement without disturbing the field wiring. Leave enough slack in the wiring for the connector to be removed.

Remove power before servicing unit.

To remove the connector:

- Pull the connector upward from the board. Apply even pressure to both ends of the connector.

To install the connector:

- Line up the pins on the module with the holes in the connector.
- Push the connector onto the pins. Apply even pressure to both ends on the connector.

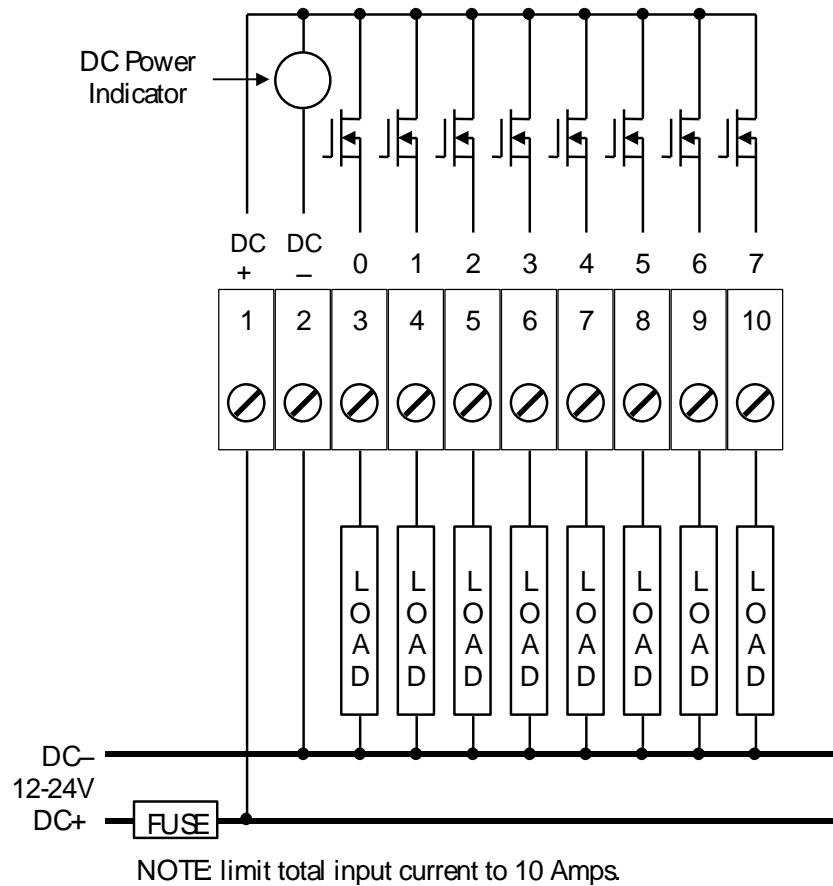


Figure 1: Typical Field Wiring

Address Selection

The 5000 Series I/O bus will support a maximum of twenty I/O (input/output) modules. 5000 Series I/O module types may be combined in any manner to the maximum supported by the controller used. The types of input and output modules available are:

- Digital Input modules
- Digital Output modules
- Analog Input modules
- Analog Output modules
- Counter Input modules

Each type of I/O module, connected to the I/O bus, has a unique I/O module address. Different types of I/O modules may have the same module address.

The address range supported by the SCADAPack controller module may restrict the I/O module address range. Refer to the controller manual for the maximum address supported.

The three address switches labeled 1, 2, and 4 set the module address. To set the address:

- Open the three switches by pressing down the left side of the switch.
- Close the switches that total to the desired address.

Figure 2: Digital I/O Module Address Switches shows the switch settings for each of the 8 module addresses.

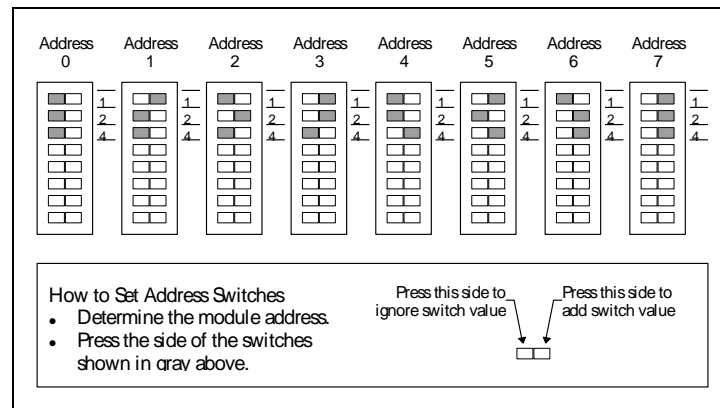


Figure 2: Digital I/O Module Address Switches

Operation and Maintenance

This module requires no routine maintenance or calibration. If the module is not functioning correctly, contact Control Microsystems Technical Support for more information and instructions for returning the module for repair.

LED Indicators

The model 5409 digital output module has one red status LED per I/O point. This LED is on when an output is turned on.

The SCADAPack controller module, through the I/O bus, powers the LEDs. The LEDs can be disabled to conserve power. Refer to the controller manual for more information.

The green DC Power LED indicates that a DC voltage has been applied to the DC+ and DC– terminals of the field wiring connector. The SCADAPack controller module does not control this LED.

Troubleshooting

Condition	Action
The DC power LED is off.	Check the DC power. Observe correct polarity. Check wiring on DC+ and DC– terminals. Check external fusing on DC supply.
Output LED does not come on when output is turned on	Check the LED power from the controller module.
Output LED comes on but the output is not energized.	Check the DC power. Check wiring on DC+ and DC– terminals.
Output LED comes on and output is energized, but the field device is not activated.	Check the field wiring. Check the field device.

Specifications

Disclaimer: Control Microsystems reserves the right to change product specifications. For more information visit www.controlmicrosystems.com.

Output Points	8
Output Range	12-24 VDC
Load Current	2A continuous per output 10A total
Surge Current	8A for 2 ms.
MOSFET Rating	50V, 12A
ON-State Voltage Drop	0.5V maximum at 2A.
OFF-State Leakage	<1uA at 24V, 25°C
Transient Protection	Inductive load protection diodes included
Isolation	1500 VAC
Addressing	DIP switch configurable
Power Requirements	5V at 70mA with all LEDs and outputs turned on 5V at 40mA with all LEDs off and all outputs turned on 24V at 30mA, typical 10V min., 32V max.
Visual Indicators	8 red LEDs, controlled by CPU for power reduction 1 green field power LED
Terminations	10 pole, removable terminal block 12 to 22 AWG 15 amp contacts
Dimensions	4.25 inch (108 mm) wide 4.625 inch (118 mm) high 1.75 inch (44 mm) deep
Mounting	7.5 x 35 DIN rail
Packaging	corrosion resistant zinc plated steel with black enamel paint
Environment	5% RH to 95% RH, non-condensing -40°C to 60°C -40°F to 140°F

Approvals and Certifications

Hazardous Locations - North America	<p>Suitable for use in Class I, Division 2, Groups A, B, C and D Hazardous Locations. Temperature Code T4</p> <p>CSA certified to the requirements of:</p> <ul style="list-style-type: none"> • CSA Std. C22.2 No. 213-M1987 - Hazardous Locations. • UL Std. No. 1604 - Hazardous (Classified) Locations.
Safety	<p>CSA (cCSAus) certified to the requirements of: CSA C22.2 No. 142-M1987 and UL508. (Process Control Equipment, Industrial Control Equipment)</p> <p>UL (cULus) listed: UL508 (Industrial Control Equipment)</p>