MANUFACTURER DOCUMENT PACKAGE

# Manufacturer's Manual

Reference package for procurement and maintenance review

HONEYWELL

## FC-SDOL-0424 V1.5

**LOOP-MONITORED SAFETY DIGITAL OUTPUT MODULE**

Used with the applicable Safety Manager SDOL-0424 configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

Selected official manufacturer pages follow this cover.

Source: Honeywell Safety Manager EP-SM.MAN.6284, Release151, pp.394-400; R162 section10.10, pp.523-533.

# 10.10 SDOL-0424

## 10.10.1 Safe loop-monitored digital output module (24 V DC, 1 A, 4 channels)

The safe loop-monitored digital output module SDOL-0424 has four 24 V DC, 1 A loop-monitored output channels to drive loads up to 24 W. The maximum module load is 3.6 A. These loads may be resistive or inductive. For inductive loads, a suppression diode is included on each output.

The outputs, including the suppression diode, the lead breakage detection and short-circuit detection, are fully tested and may therefore be used for safe applications.

The outputs are tested for:

- Ability to de-energize
- Ability to de-energize via secondary means
- Cross talk between outputs
- Function of the suppression diodes
- Lead breakage in the (external) output wiring
- Short circuit of the outputs

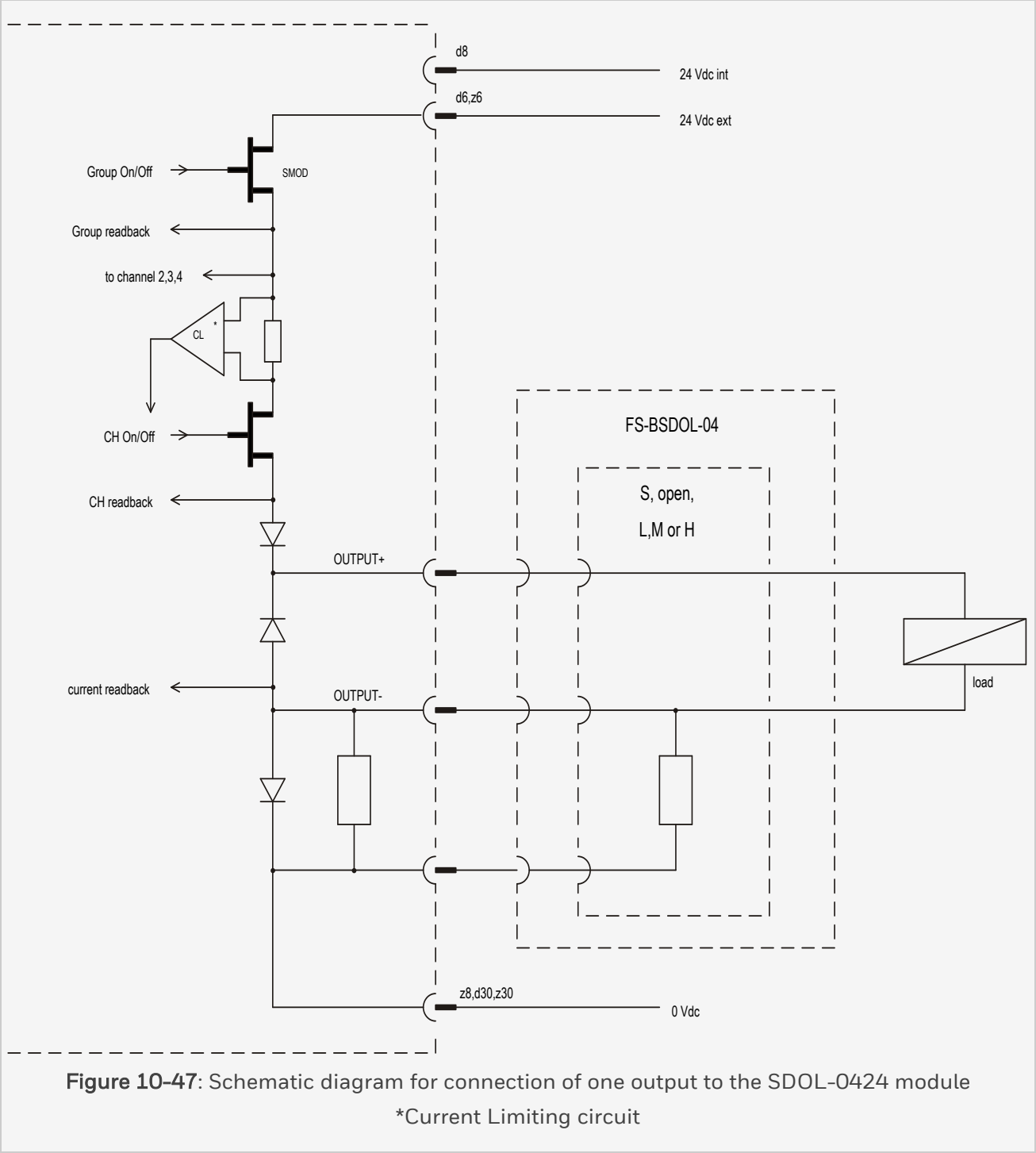



**Figure 10-47**: Schematic diagram for connection of one output to the SDOL-0424 module
*Current Limiting circuit

The outputs have secondary means of de-energizing (SMOD). This enables the watchdog and/or the processor to de-energize the outputs irrespective of the result of the application function.

**Note:**
The SDOL-0424 module can only be used in combination with an IO backplane, since the outputs require an BSDOL-04UNI module.

## 10.10.2 Loop monitoring

All outputs are monitored for lead breakage and short circuit. To get a rough lead breakage current setting, the current sense level must be programmed (see the below table). A BSDOL-04UNI module consists of a BSDOL-01 section, placed on the IO-backplane program connector PX and sixteen (4xS, 4xL, 4xM, 4xH) range setting sub-modules.

*Table 1. Selection of range-setting module*

| LOAD | | Range-setting module |
|---|---|---|
| Spare channel | | Sub-module “S” |
| 0.1-0.39 W | 4-16 mA | None |
| 0.4-1.1 W | 17-47 mA | Sub-module “L” |
| 1.2-4.7 W | 48-199 mA | Sub-module “M” |
| ≥ 4.8 W | ≥ 200 mA | Sub-module “H” |

**Attention:**
The second fault timer is started when only one Control Processor is running and the non-redundant SDOL-0424 has an open loop fault.

## 10.10.3 LEDs

The SDOL-0424 module has one LED for each channel; four in total.

If a channel is Off, its corresponding LED is off and gives short intermittent flashes. These indicate the lead breakage tests are being performed.

If a channel is On and the configuration is non-redundant, its corresponding LED is on and gives (very) short periodic flashes, which are hardly visible to the naked eye. These indicate the internal switch-off self-tests are being performed.

If a channel is On and the configuration is redundant, its corresponding LEDs appear to flash intermittently. This happens because the module in Control Processor 2 switches off briefly to allow the module in Control Processor 1 to perform its self-test. After the self-test of the module in Control Processor 1 has been completed, the module in Control Processor 2 switches on again (this may take some time) and the module in Control Processor 1 switches off to allow the module in Control Processor 2 to perform its self-test, etc. Due to this, it looks as if the channel LEDs of both modules flash intermittently. The LED flash speed may vary, depending on the application cycle time and configuration of Diagnostic Test Interval.

### 10.10.4 Pin allocation

The back view and pin allocation of the SDOL-0424 module connector are as follows:

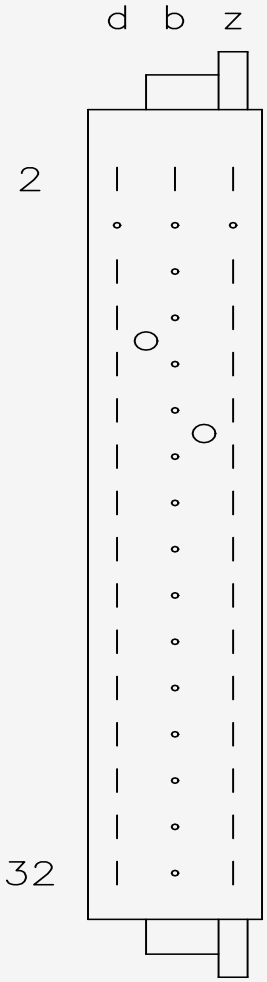



**Figure 10-48**: Back view and pin allocation of the SDOL-0424 module connector

| | |
|---|---|
| d2 | WDG |
| d4 | – |
| d6 | Supply 24 V DC ext. |
| d8 | Supply 24 V DC int. |
| d10 | |
| d12 | (0 V DC) |
| d14 | OUT 1+ |
| d16 | 0 V DC |
| d18 | OUT 2+ |
| d20 | 0 V DC |
| d22 | OUT 3+ |
| d24 | 0 V DC |
| d26 | OUT 4+ |
| d28 | 0 V DC |
| d30 | Supply 0 V DC |
| d32 | |
| b2 | GND |
| z2 | VCC |
| z4 | – |
| z6 | Supply 24 V DC ext. |
| z8 | Supply 0 V DC |
| z10 | |

| | |
|---|---|
| z12 | (0 V DC) |
| z14 | OUT 1– |
| z16 | 0 V DC |
| z18 | OUT 2– |
| z20 | 0 V DC |
| z22 | OUT 3– |
| z24 | 0 V DC |
| z26 | OUT 4– |
| z28 | 0 V DC |
| z30 | Supply 0 V DC |
| z32 | |

### 10.10.5 Connection examples

The figure below shows a connection example for the safe digital output module SDOL-0424.

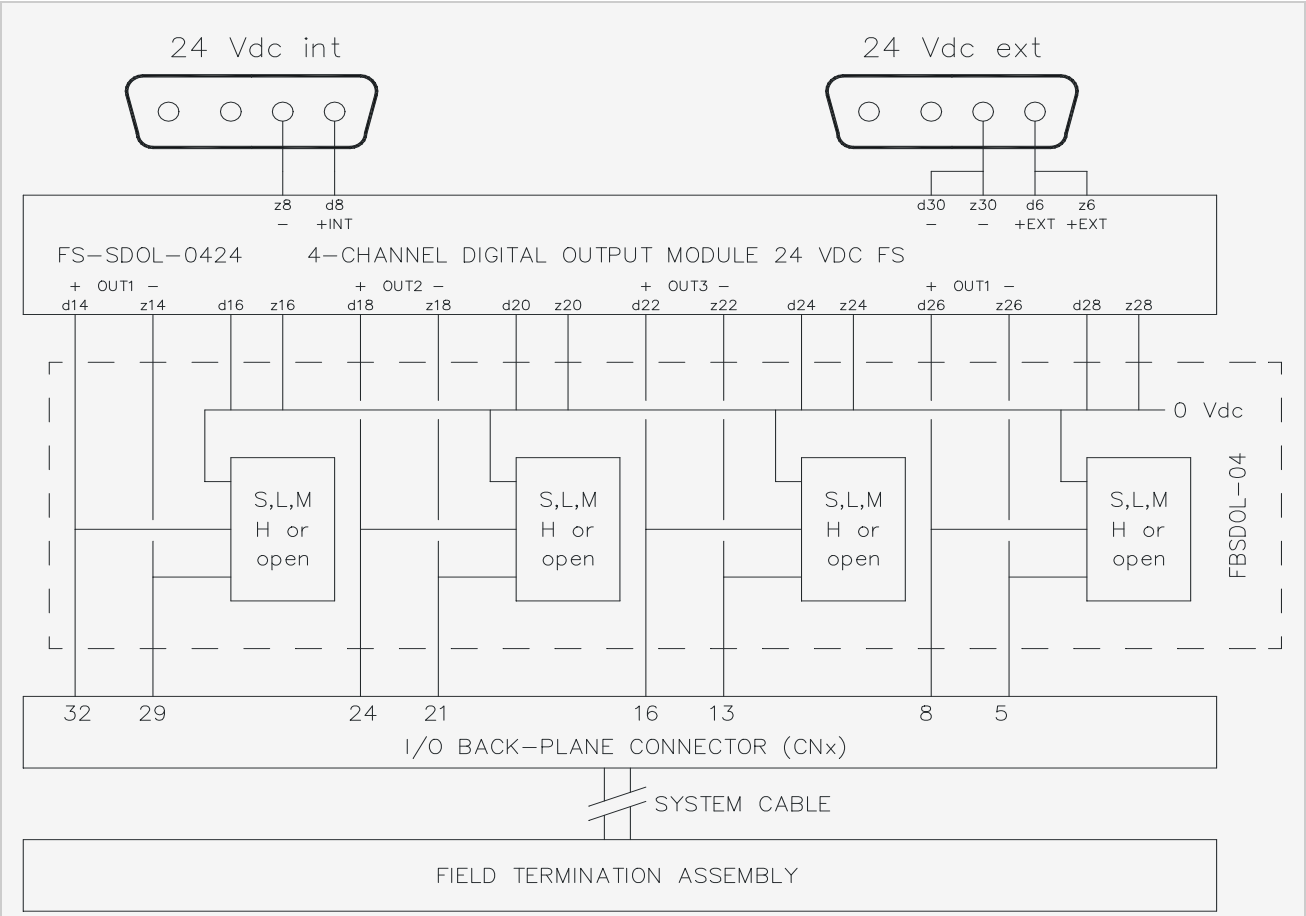



**Figure 10-49**: Connection example of SDOL-0424 module to FTA for both non-redundant and redundant IO configurations

**Note:**
The 24 V DC internal power supply (d8 and z8) must be connected to prevent fault detection during the self-test of the output module. The external power supply (d6/z6 and d30/z30), as well as (dummy) loads on all channels, must be connected to prevent fault detection during the lead breakage test of the output module.

| | | |
|---|---|---|
| General | Type numbers: | FS-SDOL-0424 |
| | | FC-SDOL-0424 |
| | Approvals: | CE, TUV, UL, CSA, FM |
| | Space requirements: | 4 TE, 3 HE (= 4 HP, 3U) |
| Power | Power requirements: | 5 V DC, 15 mA |
| | | 24 V DC internal, 50 mA |
| | | 24 V DC external, 15 mA (without output load) |
| Output | Number of output channels: | 4 |
| | Output specification: | 24 V DC solid-state source, short circuit proof |
| | Maximum channel current: | 1 A |
| | Maximum total module load: | 3.6 A (module dissipation limit) |
| | Maximum load inductance: | 0.5 H |
| | Maximum load capacitance: | 1 µF |
| | Top of overload detection: | > 10 Ω |
| | Cold resistance lamp: | > 20 Ω |
| | Voltage drop: | < 1.3 V at 1 A |
| | Off current: | < 0.1 mA |
| | Current sense voltage drop: | < 1 V at 1 A |
| | WDG input current: | 4 mA |

| | | |
|---|---|---|
| Key coding | (See section Key coding) | |
| | Module code: | |
| | • Holes | A13, C9 |
| | Chassis code: | |
| | • Large pins | A13, C9 |