

7800 SERIES S7810B Multi-Drop Switch Module

PRODUCT DATA



APPLICATION

The Honeywell 7800 SERIES is a microprocessor-based integrated burner control for automatically fired gas, oil or combination fuel single-burner applications. The 7800 SERIES is programmed to provide a level of safety, functional capability and features beyond the capacity of conventional controls. Functions provided by the 7800 SERIES include automatic burner sequencing, flame supervision, system status indication, system or self-diagnostics and troubleshooting.

The S7810B Multi-Drop Switch Module supports remote mounting of a Keyboard Display Module, personal computer communications interface for multi-dropped 7800 SERIES subnetworks, and remote reset of a 7800 SERIES Relay Module.

FEATURES

- **Multi-dropped communications bus interface.**
- **Remote reset.**
- **Ability to remotely mount a Keyboard Display Module.**

Contents

Application	1
Features	1
Specifications	2
Ordering Information	2
Installation	2
Building a Multi-Drop Network	3
Operation	4



SPECIFICATIONS

Model: S7810B Multi-Drop Switch Module.

Electrical Ratings:

Voltage and Frequency:

13 Vdc peak full-wave rectified (+20/-15%).

Power Dissipation:

2W maximum.

Terminal Ratings:

Power: 13 Vdc peak full-wave rectified.

Earth ground.

Local ControlBus (1,2,3) and Multi-Drop ControlBus

(6,7,8): 5 Vdc at 1 mA maximum.

Electrical Connector (included): ControlBus: 208727 8-pin electrical connector.

Environmental Ratings:

Ambient Temperature:

Operating: -40°F to +140°F (-40°C to +60°C).

Storage: -40°F to +150°F (-40°C to 66°C).

Humidity:

85% relative humidity continuous, noncondensing.

Vibration:

0.5G environment.

Dimensions: See Fig. 1.

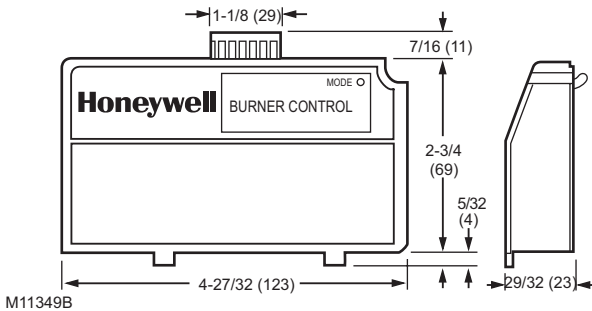


Fig. 1. Mounting dimensions of S7810B Multi-Drop Switch Module in in. (mm).

Weight: 4 ounces.

Replacement Part: 208727 eight-pin electrical connector.

ORDERING INFORMATION

When purchasing replacement and modernization products from your TRADELINE® wholesaler or distributor, refer to the TRADELINE® Catalog or price sheets for complete ordering number.

If you have additional questions, need further information, or would like to comment on our products or services, please write or phone:

1. Your local Honeywell Automation and Control Products Sales Office (check white pages of your phone directory).
2. Honeywell Customer Care
1885 Douglas Drive North
Minneapolis, Minnesota 55422-4386

In Canada—Honeywell Limited/Honeywell Limitée, 35 Dynamic Drive, Scarborough, Ontario M1V 4Z9.

International Sales and Service Offices in all principal cities of the world. Manufacturing in Australia, Canada, Finland, France, Germany, Japan, Mexico, Netherlands, Spain, Taiwan, United Kingdom, U.S.A.

INSTALLATION

When Installing this Product...

1. Read these instructions carefully. Failure to follow them could damage the product or cause a hazardous condition.
2. Check the ratings given in the instructions and marked on the product to make sure the product is suitable for your application.
3. The installer must be a trained, experienced flame safeguard technician.
4. Disconnect the power supply before beginning installation to prevent electrical shock and equipment damage. More than one power supply disconnect can be required.
5. Wiring must comply with all applicable codes, ordinances and regulations.
6. After installation is complete, check out product operation as provided in these instructions.

IMPORTANT:

This equipment can cause interference with radio communications.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the Instructions Manual, may cause interference with radio communication. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case, users at their own expense will be required to take whatever measures may be required to correct the interference. Any unauthorized modification of this equipment may result in the revocation of the owner's authority to continue its operation. When operating the S7810B remotely with a separate power supply, FCC compliance is not guaranteed unless an FCC-approved power supply is used.

Canadian EMI: This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Humidity

Install the S7810B where the relative humidity never reaches the saturation point. The S7810B is designed to operate in a maximum humidity environment of 85 percent relative humidity continuous, noncondensing moisture.

Weather

The S7810B is not designed to be weather-tight. When installed outdoors, protect the S7810B with an approved weather-tight enclosure.

Vibration

Do not install the S7810B where it could be subjected to vibration in excess of 0.5G continuous maximum vibration.

Mounting the S7810B Multi-Drop Switch Module.

1. Align the two ears of the Multi-Drop Switch Module with the two mating slots on the 7800 SERIES Relay Module.
2. Insert the two interlocking ears into the two mating slots and, with a hinge action, push on the lower corners of the Multi-Drop Switch Module to secure it to the 7800 SERIES Relay Module.

Wiring (Fig. 2)

1. Refer to Fig. 2 for proper wiring.
2. All wiring must comply with all applicable electrical codes, ordinances and regulations.
3. Recommended wiring size and type:
 - a. For ControlBus™ communications, use 22 AWG, 3-wire shielded cable (Belden part number 8723 or equivalent).
 - b. For 13 Vdc and remote reset switch operation, use 22 AWG wire insulated for voltages and temperatures in the application. Suggested wire types include TW (60°C), THW (75°C) and THHN (90°C) Terminal identification numbers and letters shown in Table 1.

Table 1. S7810B and QS7800B Terminal Identification.

Signal	S7810B Terminal	QS7800B Terminal
Local Bus Data +	1	None
Local Bus Data -	2	None
Common <ul style="list-style-type: none"> • Local Bus Common • +13 Vdc Common • Remote Reset Common 	3	None
+13 Vdc	4	None
Remote Reset	5	None
Multi-Drop Bus Common	6	c
Multi-Drop Bus Data +	7	a
Multi-Drop Bus Data -	8	b

4. Wire routing:
 - a. Do not route the ControlBus^a cable in conduit with line voltage circuits.
 - b. Do not route the ControlBus^a cable close to the ignition transformers.
 - c. Route the ControlBus^a cable outside of conduit if properly supported and protected from damage.
 - d. Route the ControlBus^a cable so that all devices are connected in a daisy chain configuration. See Fig. 3.
5. Maximum wire lengths:
 - a. RS-485 Communications bus, 4000 feet (1219 meters).
 - b. Remote reset switch, 1000 feet (305 meters).

BUILDING A MULTI-DROP NETWORK

The subnetwork addressing in the Q7700 Network Interface Unit (NIU) is not contiguous. It is divided into two blocks, containing 198 and 24 addresses, respectively. A maximum multi-drop configuration would include 222 subnetworks (198 plus 24) on a single Q7700 NIU.

One QS7800B ControlBus^a Module card supports up to 31 multi-drop subnetworks without using an RS-485 repeater. If an RS-485 repeater is used, up to 61 multi-drop subnetworks can be supported by one QS7800B card. The RS-485 repeater must be installed between the 30th and 31st subnetworks.

Each subnetwork includes one 7800 SERIES controller with or without an S7800 Keyboard Display Module and/or an S7830 Expanded Annunciator. An S7810B1007 Multi-Drop Switch Module is required in each subnetwork. See Fig. 3 for wiring information.

Subnetworks can be spread evenly (balanced) across the NIU slots to improve speed of communications.

It is recommended that the multi-drop network be built starting with slot number 1 of the NIU, subject to the above guidelines.

Record the serial number and physical location of each S7810B Multi-Drop Switch. This data will be useful when commissioning the ZM7850 Combustion System Manager (CSM) software. Refer to CSM manual, form 65-0102, for CSM commissioning.

Examples

Network with Maximum of 198 Subnetworks

NIU Slot Numbers	1	2	3	4	5	6	Total
Number of Subnetworks	61	61	61	15	Open	Open	198
Subnetworks Balanced	33	33	33	33	33	33	198

The open NIU slots can be used for other QS7800 ControlBus™ Module Cards.

Network with Maximum of 222 Subnetworks

NOTE: For networks that have more than 198 subnetworks, the last NIU card slot must have the 199th through 222nd subnetwork attached to it.

NIU Slot Numbers	1	2	3	4	5	6	Total
Number of Subnetworks	61	61	61	15	24	Open	222
Subnetworks Balanced	40	40	40	39	39	24	222

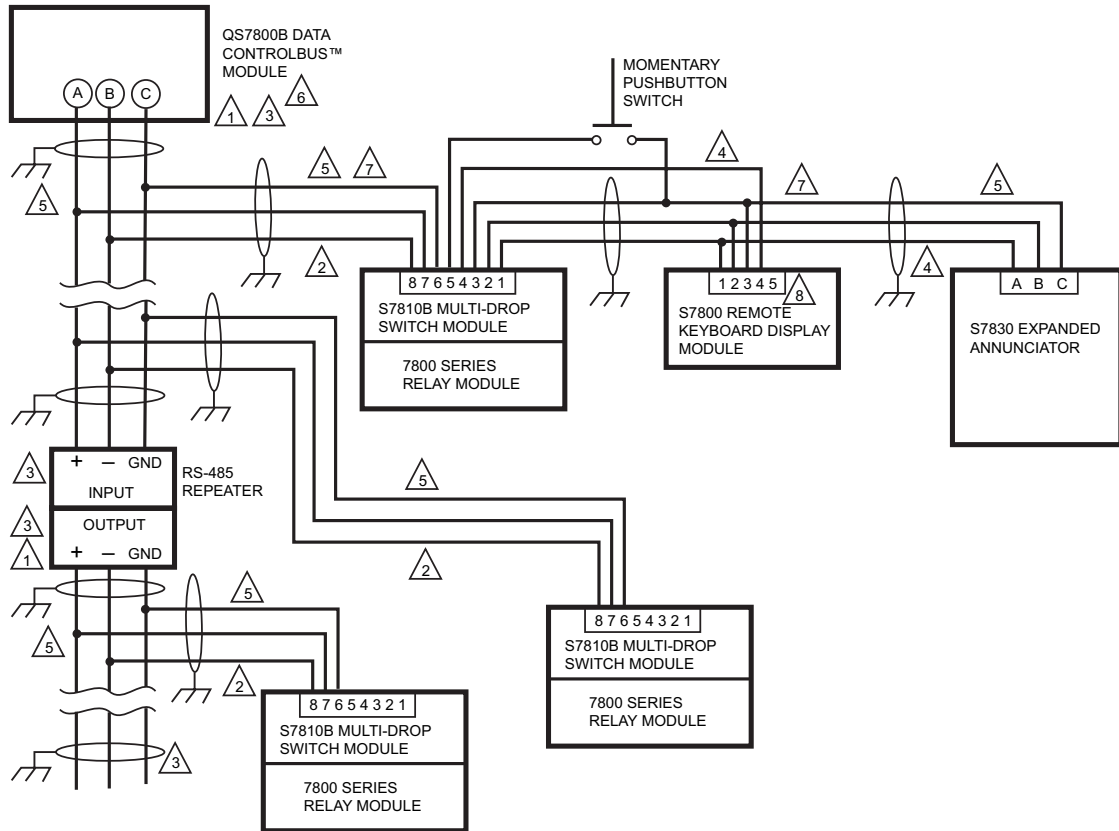
The open NIU slot can be used for other QS7800 ControlBus™ Module Cards.

OPERATION

The S7810B Multi-Drop Switch Module has two communications ports. One communications port allows communication on a local bus that contains a burner controller and a keyboard display module(s) and/or an expanded annunciator. The other communications port is an addressed switched port which, when switched on by the QS7800B

ControlBus^a Module, communicates data from the local bus to the multi-drop bus. The S7810B also provides a +13 Vdc output for power to a remote Keyboard Display Module and an input for a remote reset switch.

A MODE light emitting diode (LED) provides status information through several blinking patterns. The patterns repeat every 1.6 seconds. See Table 2.

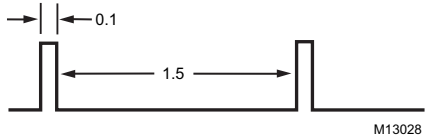
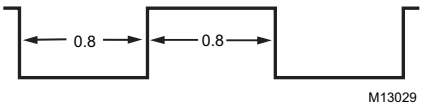
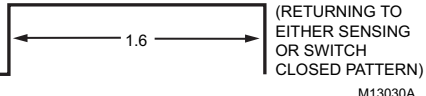
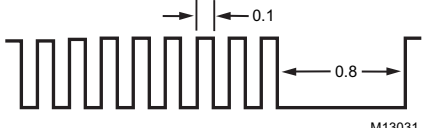
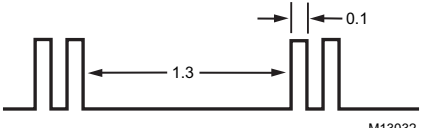


- 1 MULTI-DROP RS-485 COMMUNICATIONS BUS. UP TO 31 S7810B MULTI-DROP SWITCH MODULES (SUBNETWORKS) CAN BE CONNECTED TO A SINGLE QS7800B CONTROLBUS™ MODULE WITHOUT AN RS-485 REPEATER. UP TO 61 S7810B MULTI-DROP SWITCH MODULES (SUBNETWORKS) CAN BE CONNECTED TO A SINGLE QS7800B CONTROLBUS™ MODULE WITH AN RS-485 REPEATER. WHEN USING AN RS-485 REPEATER, THE REPEATER MUST BE INSTALLED BETWEEN THE 30TH AND 31ST SUBNETWORKS.
- 2 THE SUBNETWORKS MUST BE WIRED IN A DAISY CHAIN CONFIGURATION. RECOMMEND THAT THE QS7800B CONTROLBUS™ MODULE BE AT ONE END OF THE DAISY CHAIN.
- 3 MULTI-DROP COMMUNICATIONS BUS TERMINATION RESISTORS:
 - A. WITHOUT RS-485 REPEATER: MODULES AT THE CLOSEST AND FARTHEST END OF THE DAISY CHAIN REQUIRE TERMINATION RESISTORS. INSTALL A 120 OHM, 1/4 WATT RESISTOR BETWEEN TERMINALS a AND b OF THE QS7800B CONTROLBUS™ MODULE. (IF INSTALLED AT ONE END OF DAISY CHAIN), INSTALL A 120 OHM, 1/4 WATT RESISTOR BETWEEN TERMINALS 7 AND 8 OF THE LAST S7810B MULTI-DROP SWITCH MODULE IN THE DAISY CHAIN.
 - B. WITH RS-485 REPEATER: WHEN AN RS-485 REPEATER IS USED, TWO DAISY CHAIN CONFIGURATIONS ARE EFFECTIVELY FORMED. MODULES AT THE CLOSEST AND FARTHEST ENDS OF EACH DAISY CHAIN REQUIRE TERMINATION RESISTORS. INSTALL A 120 OHM, 1/4 WATT RESISTOR BETWEEN TERMINALS a AND b OF THE QS7800B CONTROLBUS™ MODULE. (IF INSTALLED AT ONE END OF DAISY CHAIN), INSTALL A 120 OHM, 1/4 WATT RESISTOR BETWEEN INPUT TERMINALS DATA+ AND DATA- OF THE RS-485 REPEATER. INSTALL A 120 OHM, 1/4 WATT RESISTOR BETWEEN OUTPUT TERMINALS DATA+ AND DATA- OF THE RS-485 REPEATER. INSTALL A 120 OHM, 1/4 WATT RESISTOR BETWEEN TERMINALS 7 AND 8 OF THE LAST S7810B MULTI-DROP SWITCH MODULE IN THE SECOND DAISY CHAIN.
- 4 LOCAL RS-485 COMMUNICATION BUS. THE DEVICES ON THIS BUS MUST BE WIRED IN A DAISY CHAIN CONFIGURATION. THE ORDER OF INTERCONNECTION IS NOT IMPORTANT. THE MODULES ON THE CLOSEST AND FARTHEST ENDS OF THE DAISY CHAIN REQUIRE A 120 OHM, 1/4 WATT, TERMINATION RESISTOR BETWEEN TERMINALS 1 AND 2 OR a AND b.
- 5 THREE-WIRE SHIELDED CABLE (BELDEN 8723 SHIELDED OR EQUIVALENT) IS RECOMMENDED AND SHOULD BE GROUNDED AS FOLLOWS: IF NO INTERFERENCE IS PRESENT, OR TO REDUCE CAPACITIVE INTERFERENCE, THE SHIELD SHOULD BE GROUNDED AT ONE END. WHEN GROUNDING ONLY ONE END OF THE SHIELD, THE SHIELD END CLOSEST TO THE S7810B MULTI-DROP SWITCH MODULE SHOULD BE ATTACHED TO EARTH GROUND. TO REDUCE INDUCTIVE INTERFERENCE (RF INTERFERENCE), THE SHIELD SHOULD BE GROUNDED AT BOTH ENDS.
- 6 REFER TO QS7800B DATA CONTROLBUS™ MODULE INSTRUCTIONS, FORM 65-0227, FOR INSTALLATION INSTRUCTIONS.
- 7 THE MULTI-DROP BUS COMMON, S7810B TERMINAL 6, AND THE LOCAL BUS COMMON, S7810B TERMINAL 3, MUST NOT BE ELECTRICALLY CONNECTED TOGETHER.
- 8 TERMINAL NUMBERS ARE ON 203541 5-WIRE CONNECTOR (SUPPLIED WITH REMOTE MOUNTING BRACKET).

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Fig. 2. Wiring S7810B Multi-Drop Switch Module.

Fig. 3. Explanation of MODE LED light patterns.

Pattern in Seconds	Description
	<p>OFF LINE: The S7810B is not receiving any messages from the QS7800B ControlBus™ Module. LED is off for 1.5 seconds and on for 0.1 second. Check for:</p> <ul style="list-style-type: none"> • Wiring problems on multi-drop bus (loose connections, broken wires, or miswired connections). • QS7800B ControlBus™ Module or S7810B Multi-drop Switch Module not connected to multi-drop bus. • QS7800B ControlBus™ Module not properly seated in Q7700 Network Interface Unit slot. • No power to Q7700 Network Interface Unit.
	<p>SENSING: The S7810B is receiving messages from the QS7800B ControlBus™ Module. LED is off for 0.8 second and then on for 0.8 second. The SENSING pattern reverts to the OFF LINE pattern when it has not received a message from the QS7800B ControlBus™ Module for more than four seconds.</p>
 <p>(RETURNING TO EITHER SENSING OR SWITCH CLOSED PATTERN)</p>	<p>ALARM LISTEN: The S7810B monitors devices on the local bus and notes any alarm condition. LED is on for 1.6 seconds then reverts to the SENSING or switch closed pattern.</p>
	<p>SWITCH CLOSED: The S7810B multi-drop bus port switch has been switched on by the QS7800B ControlBus™ Module and data from the local bus is being sent to the multi-drop bus. LED is off for 0.1 second and on for 0.1 second, repeating for the 1.6 seconds duration.</p>
	<p>FAULT: The S7810B has an internal fault. LED is off for 1.3 seconds, on for 0.1 second, off for 0.1 second, on for 0.1 second. (Pattern is mainly off with two short blinks.)</p>
<p>ON —————</p> <p>OR</p> <p>OFF —————</p> <p>M13033</p>	<p>STEADY STATE CONDITIONS: LED is always OFF. S7810B is either defective or no power has been applied to it. LED is always ON. S7810B is defective.</p>

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