



Micro800™
2 Ch High Current Digital Output Module
 (Catalog Number 2080sc-OW2IHC)

For Technical Support

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For More Information

PLC sample projects and documentation are available on our website at <http://www.spectrumcontrols.com>

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Environment and Enclosure



This equipment is intended for use in a Pollution Degree 2 industrial environment, in overvoltage Category II applications (as defined in IEC publication 60664-1), at altitudes up to 2000 meters (6562 ft) without derating.

This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR Publication 11. Without appropriate precautions, there may be potential difficulties ensuring electromagnetic compatibility in other environments due to conducted as well as radiated disturbance.

This equipment is supplied as open-type equipment. It must be mounted within an enclosure that is suitably designed for those specific environmental conditions that will be present and appropriately designed to prevent personal injury resulting from accessibility to live parts. The enclosure must have suitable flame-retardant properties to prevent or minimize the spread of flame, complying with a flame spread rating of 5VA, V2, V1, V0 (or equivalent) if non-metallic. The interior of the enclosure must be accessible only by the use of a tool. Subsequent sections of this publication may contain additional information regarding specific enclosure type ratings that are required to comply with certain product safety certifications.

In addition to this publication, see:

- Industrial Automation Wiring and Grounding Guidelines, Allen-Bradley publication 1770-4.1, for additional installation requirements.
- NEMA Standards publication 250 and IEC publication 60529, as applicable, for explanations of the degrees of protection provided by different types of enclosure

Prevent Electrostatic Discharge

ATTENTION

Electrostatic discharge can damage integrated circuits or semiconductors if you touch bus connector pins. Follow these guidelines when you handle the module:

- Touch a grounded object to discharge static potential.
- Wear an approved wrist-strap grounding device.
- Do not touch connectors or pins on component boards.
- Do not touch circuit components inside the module.
- If available, use a static-safe work station.
- When not in use, keep the module in its static-shield box.

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ATTENTION

To comply with the CE Low Voltage Directive (LVD), all connected I/O must be powered from a source compliant with the following: Safety Extra Low Voltage (SELV) or Protected Extra Low Voltage (PELV).

Environnements dangereux

Cet équipement est conçu pour être utilisé dans des environnements de Classe I, Division 2, Groupes A, B, C, D endroit dangereux ou non dangereux. La mise en garde suivante s'applique à une utilisation dans des environnements dangereux.

MISE EN GARDE

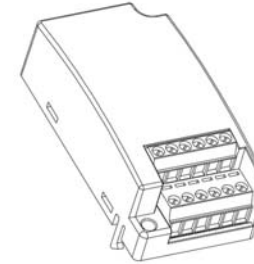


DANGER D'EXPLOSION

- La substitution de composants peut rendre cet équipement impropre à une utilisation en environnement de Classe 1, Division 2.
- Ne pas remplacer de composants ou déconnecter l'équipement sans s'être assuré que l'alimentation est coupée ou que l'endroit soit dépourvu de concentrations inflammables.
- Ne pas connecter ou déconnecter des composants sans s'être assuré que l'alimentation est coupée.
- Ce produit doit être installé dans une armoire.
- Tout le câblage doit agréer la norme N.E.C. article 501-4(b).

Parts List

Your package contains one Micro800 High Current Digital Output Plug-in Module and one Quick Start guide.



You can choose to wire the plug-in before inserting it onto the controller, or wire it once the module is secured in place.

ATTENTION

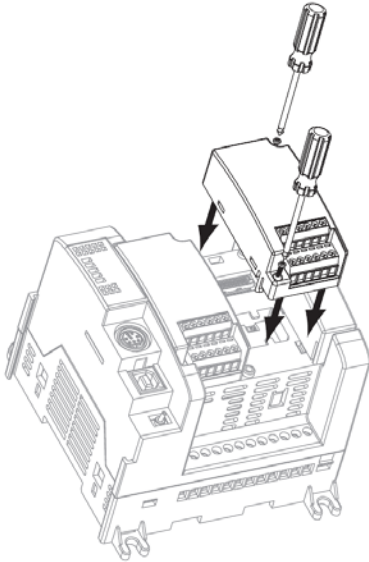


- This equipment is considered Group 1, Class A industrial equipment according to IEC/CISPR 11. Without appropriate precautions, there may be difficulties with electromagnetic compatibility in residential and other environments due to conducted and radiated disturbance.
- Be careful when stripping wires. Wire fragments that fall into the controller could cause damage. Once wiring is complete, make sure the controller is free of all metal fragments before removing the protective debris strip.
- Do not wire more than 2 conductors on any single terminal.
- If you insert or remove the plug-in module while power is on, an electrical arc can occur. This could cause an explosion in hazardous location installations. Be sure that power is removed or the area is nonhazardous before proceeding.
- Cable length should be less than 10 meters.
- Do not insert or remove the plug-in module while power is applied, otherwise, permanent damage to equipment may occur.

Insert Module into Controller

Follow the instructions to insert and secure the plug-in module to the controller.

1. Position the plug-in module with the terminal block facing the front of the controller as shown.



2. Snap the module into the module bay.
3. Using a screwdriver, tighten the 10...12 mm (0.39...0.47 in.) M3 self tapping screw to torque specifications.

Hazardous Location Considerations

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D hazardous locations or non-hazardous locations only. The following WARNING statement applies to use in hazardous locations.

WARNING**EXPLOSION HAZARD**

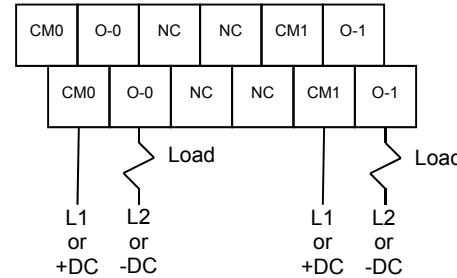
- Substitution of components may impair suitability for Class I, Division 2.
 - Do not replace components or disconnect equipment unless power has been switched off or the area is known to be free of ignitable concentrations.
 - Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.
 - This product must be installed in an enclosure.
 - All wiring must comply with N.E.C. article 501-4(b).
-

Environmental Tests	Industry Standards	Test Level Limits
EFT/B immunity	IEC 61000-4-4*	Signal Ports: ± 3 kV @ 5 kHz for 5 minutes Power Ports: ± 2 kV @ 5 kHz for 5 minutes
Surge transient immunity (Performance Criteria B)	IEC 61000-4-5	Signal Ports: ± 2 kV line-earth Power Ports ± 2kV CM ± 1kV DM
Conducted RF immunity (Performance Criteria A)	IEC 61000-4-6	10V rms with 1 kHz sine wave 80%AM from 150 kHz...80 MHz on signal and power ports
Magnetic Field (Performance Criteria A)	IEC 61000-4-8	30Arms/m
AC Mains Voltage Dips, Interruptions and Variations	IEC 61000-4-11	Standard

Safety Tests	Industry Standards	Test Level Limits
UL Safety	UL 508 Industrial Control Equipment Seventeenth Edition Dated January 28 1999, with revisions through July 11, 2005 (ANSI/UL 508-2005) (NRAQ, NRAQ7) cUL CSA C22.2 No. 142 -M1987 Process Control Equipment May 1987	As required
UL Hazardous Locations	ULH ANSI/ISA-12.12.01-2007 Nonincendive Electrical Equipment for Use in Class I, Division 2 Hazardous (Classified) Locations cULH CSA C22.2 No. 213-M1987 - Non-incendive Electrical Equipment for use in Class I Division 2 Hazardous Locations - March 1987	As required
CE Low Voltage Directive	IEC 61131-2 Programmable Controllers Part 2: Equipment Requirements and Tests; Second Edition 2003-02, Section 11-14	As required

Wire the Module

Follow the wiring diagrams below to wire the module.



Note: In the diagram above, terminals with the same label are internally shorted together. Example, CM0 (Top Row) and CM0 (Bottom Row) are internally shorted together.

Configuring the Module

The 2080sc-OW2IHC doesn't really require configuration. It only needs to be placed into run mode. Write a value of 165 decimal to memory location 17 (MOD_MODE_CONTROL). See Table 3 for more information.



Micro 800 controllers running OS firmware revision 1.12 or older, require a decimal value of 16 be written to memory location 11 (CONTR_OPS_STATUS) before the module will go into run mode. See program sample on page 9.

Module Input Data

General module status can be read from memory location 16. Refer to table below for possible responses.

Table 1 (General Module Status)

Bit Number	Description
0-1	These 2 bits define module operation mode, 0: Idle: Module is ready to RUN, and I/O is off. 1: RUN: Module is under RUN, and I/O is on. 2: Error: Error happens, and I/O is off. 3: Busy: Module is busy, cannot go to RUN, and I/O is off.

Module Output Data

The two output channels on the OW2IHC are controlled by memory location 64, bits 0 and 1 control channels 0 and 1 respectively. See Table 3 for memory location offsets. The table below describes the state of each output channel in relation to the control bits.

Table 2 (Output States)

Channel #	Bit state	Output State
0	0	OPEN
	1	CLOSED
1	0	OPEN
	1	CLOSED

Adding the OW2IHC to CCW

The 2080sc-OW2IHC is configured for CCW (Connected Components Workbench) using the PLUGIN_READ and PLUGIN_WRITE instructions for generic plug-in modules.

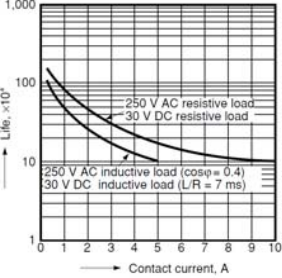
The configuration, output data, and status structures discussed in the sections above, are stored at different memory locations in the module. The following table lists the memory location offset for each parameter which is used when configuring the PLUGIN_READ, WRITE, and INFO instructions.

Table 3 (Parameter Offset)

Parameter	Offset (Dec)	Comments
MOD_ID_LO	0	Module ID
MOD_ID_HI	1	
VENDOR_ID_LO	2	Vendor ID
VENDOR_ID_HI	3	
PRODUCT_TYPE_LO	4	
PRODUCT_TYPE_HI	5	
PRODUCT_CODE_LO	6	
PRODUCT_CODE_HI	7	
MOD_REV_LO	8	Minor revision, 1-255
MOD_REV_HI	9	Major revision, 1-127
CONTR_OPS_STATUS	11	Controller operation status information (see Table 4)
MOD_STATUS	16	Module status register (see Table 1)

Environmental Specifications

Environmental Tests	Industry Standards	Test Level Limits
Temperature (Operating)	IEC60068-2-1: (Test Ad, Operating Cold), IEC60068-2-2: (Test Bd, Operating Dry Heat), IEC60068-2-14: (Test Nb, Operating Thermal Shock)	-20 to 65°C (-4 to 149°F)
Temperature (Non-operating)	IEC60068-2-1: (Test Ab, Unpackaged Non-operating Cold), IEC60068-2-2: (Test Bb, Unpackaged Non-operating Dry Heat), IEC60068-2-14: (Test Na, Unpackaged Non-operating Thermal Shock)	-40 to 85°C (-40 to 185°F)
Operating Altitude	2000 meters (6561 feet)	Not tested
Humidity (Operating)	IEC60068-2-30: (Test Db, Unpackaged Damp Heat):	5 to 95% non-condensing
Vibration (Operating)	IEC60068-2-6: (Test Fc, Operating)	5G
Shock (Operating)	IEC60068-2-27: (Test Ea, Unpackaged Shock)	10 g
Shock (Non-operating)	IEC60068-2-27: (Test Ea, Unpackaged Shock)	50 g
Radiated Emissions	CSIPR 11; Group 1, Class A	30MHz – 1GHz
Conducted Emissions	IEC 61000-6-4:2007 Group 1, Class A (AC Mains)	150kHz – 30MHz
ESD immunity	IEC 61000-4-2	4kV Indirect (Coupling Plate) 4kV Contact Discharge (to points of initial contact) 8kV Air Discharge (to points of initial contact)
Radiated RF immunity	IEC 61000-4-3: Level 3	10 V/M with 1 kHz sine-wave 80%AM from 80...2000 MHz 10 V/M with 200 Hz sine-wave 50% Pulse 100%AM @900 MHz 10 V/M with 200 Hz sine-wave 50% Pulse 100%AM @1890 MHz 3 V/M with 1 kHz sine-wave 80%AM from 2000...2700 MHz

Minimum Load	10mA at 5VDC per point. (This value can change due to the switching frequency, environmental conditions, and desired reliability level, therefore it is recommended to check this with the actual load.)
Initial Contact Res. of Relay	< 5mΩ typical, 30 mΩ max
Expected Life of Electrical Contacts	100k operations @ 20 times/min, at rated resistive capacity and temperature. 
Switching Frequency	Maximum 1 cycle /3s at rated load (1.5s on, 1.5s off)
Bounce Time	1.2 ms average
Maximum Off State Leakage	1.5mA Maximum
Output Delay Time (From the time the module receives data)	10ms maximum on/off (5 ms typical) excluding bounce time
Status Indicators	2 yellow Status Indicators (I/O)
Power source	3.3 VDC, 24 VDC from backplane
Input to backplane isolation	250 VAC continuous, tested at 2300VAC for 1 min.
Channel to channel isolation	250 VAC continuous, tested at 1500VAC for 1 minute
Power consumption	<=35 mA at 3.3V, <=20 mA at 24V, <1.5 W
Inrush current	<120 mA at 3.3V, <120 mA at 24V
Fusing	Use external if desired
Terminal block Wire size	#16 - #30 AWG
Terminal block torque	0.19 Nm (1.7 lb-in)
Mounting torque	0.2 Nm (1.48 lb-in)
Manufacturing	RoHS compliant
Dimensions	58.4mm x 29.3mm x 25mm
Status Indicators	Individual OFF/ON Status for each I/O point

Parameter	Offset (Dec)	Comments
MOD_MODE_CONTROL	17	Module Mode Control Register
OUTPUT_DATA	64	Output Data Register

Table 4(Controller Operation Status Register)

Bit Number	Description
0-3	Controller Error info: 0x00: no Error; 0x01: Operation Error; 0x02: Fatal Error 0x03-0x0F: reserved ;
4-5	Controller mode: 0x00: non-RUN mode; 0x01: RUN mode; 0x02-0x03 : reserved ;
6-7	Controller Power info: 0x00: Power O.K.; 0x01: power failure triggered; 0x02-0x03: reserved

The following sample program, written in structured text, demonstrates how to configure the module in CCW.

```
u800Slot := 1; (* Slot number for module. *)
```

```
(* This section of code is to handle the controller with Firmware earlier than rev 1.13 *)
SYS_INFO_FW(True);
IF (SYS_INFO_FW.Sts.OSMajRev = 1 and SYS_INFO_FW.Sts.OSMinRev <=12) THEN
  IF SYS_INFO_FW.Sts.MajErrCode = 0 THEN
    ControllerStatus[1] := 2#00010000;
    WriteControllerStatus(True,u800Slot,11,1,ControllerStatus);
  END_IF;
END_IF;
```

```
RunMode[1] := 16#A5; (* Initialize RunMode register *)
WriteModModeControl(true,u800Slot,17,1,RunMode); (* Write A5 Hex to MOD_MODE_CONTROL for run mode*)
ReadModStatus(true,u800Slot,16,1,OW2IHC_S1_ModStatus); (* Read general module status *)
WriteOutputs(True,u800Slot,64,1,OW2IHC_S1_Outputs); (* Write Output states *)
```

Table 5 (CCW Program Variables)

Variable Name	Data Type	Dimension
U800Slot	UINT	NA
SYS_INFO_FW	SYS_INFO	NA
ControllerStatus	USINT	[1..1]
WriteControllerStatus	Plugin_Write	NA
WriteModModeControl	Plugin_Write	NA
RunMode	USINT	[1..1]
ReadModStatus	Plugin_Read	NA
OW2IHC_S1_ModStatus	USINT	[1..1]
WriteOutputs	Plugin_Write	NA
OW2IHC_S1_Outputs	USINT	[1..1]

The sample project on the previous page, can be downloaded from our website at <http://www.spectrumcontrols.com/downloads.htm>

Electrical Specifications

Relay Output Specifications

Description	2 channel relay output module.							
Relay Functionality	Form A normally open							
Output Current Rating (at rated power)	Resistive load at up to 30° C 10A @ 5-30V dc 10A @ 125V ac 10A @ 250V ac Resistive load at up to 65° C 6A @ 5-30V dc 6A @ 125V ac 6A @ 250V ac							
Output Power Rating (Resistive)	Resistive load at up to 30° C 300W Maximum for 30.0VDC 1250VA Maximum for 125VAC 2500VA Maximum for 250VAC							
UL Pilot Duty Contact Ratings (Power factor 0.35 or less for AC):	Inductive Loads¹							
	AC Contact Rating Code Designation	Thermal continuous test current (A)	Max. current (A) ^{a,b}				Max. VA	
			120 VAC		240VAC			
		Make	Break	Make	Break	Make	Break	
B300	5	30	3	15	1.5	3600	360	
Notes: ^a Power factor 0.35 or less ^b For maximum ratings at voltages between the maximum design value and 120 volts, the maximum make and break ratings are to be obtained by dividing the volt-amperes rating by the application voltage. For voltages below 120 volts, the maximum make current is to be the same as for 120 volts, and the maximum break current is to be obtained by dividing the break volt-amperes by the application voltage, but these currents are not to exceed the thermal continuous test current.								
Additional UL ratings:	DC Contact Rating Code Designation	Thermal continuous test current (A)	Max. make/break current (A) ^{c,d}		Max. make / break VA			
			125 VDC	250VDC				
	R150	1.0	0.22	-	28			
R300	1.0	0.22	0.11	28				
Notes: ^c The maximum make and break ratings are to be obtained by dividing the volt-ampere rating by the application voltage, but the current values are not to exceed the thermal continuous test current. ^d Inductive loads as specified in Section 8.2.7 of Industrial Control and Systems; Control Circuit and Pilot Devices, ANSI/NEMA ICS5-1993.								
1/3 hp, 125 V ac, 250V ac 30V dc Make / Break 2A (Pilot Duty) 250V ac, Make 20A / Break 2A (Pilot Duty) 2A, 250V ac, Tungsten Lamp 2A, 30V dc, Tungsten Lamp								

¹ Connecting surge suppressors across your external load will extend the life of the relay contacts.