

Chen Sen CS-IOM3731-0A Module User Manual

Introduction

CS-IOM3731-0A module is a multiplexer designed to expand the digital input/output capacity of the Johnson Controls FEC/FAC series of DDC controller significantly. This module contains one input and two output conversion units. The input conversion unit can convert one analog input (AI/UI) signal to eight digital input (BI) signals, and either of the two output conversion units can convert one analog output (AO/CO) signal to five digital output (BO) signals. So, this module can only occupy one AI/UI channel and one or two AO/CO channels of a FEC/FAC controller; therefore, CS-IOM3731-0A module can to extend up to eight BI channels and five or ten BO (RO) channels.

The quantitative conversion relation between analog input signal and digital input signal are as follows:

	Analog input	Digital input
Input conversion unit	Analog Input 1	Binary Input 1~8
The first group conversion unit	Analog Output 1	Binary Output 1~5
The second group conversion unit	Analog Output 2	Binary Output 6~10

Chen Sen Controls has written three exclusive macros named CS-IOM-AI1/-AO1/-AO2 for FEC/FAC series controllers, which correspond to the module's three conversion units separately. The macros encapsulate the digital signals extended by CS-IOM into macro's output signals, which can be conveniently called in customer's application program.

Taking the CS-IOM-AO1 macro for example, the following content is to introduce how to add, use and debug macro programs in the FEC/FAC series controller in detail. If your computer has installed CCT software, please follow the steps and try to operate.

Note:

1. In the CCT, CS-IOM-AI1 macro will occupy 5% of program memory.

2. In the CCT, CS-IOM-AO1/-AO2 macro will occupy 3-4% of program memory.

3. Make sure that the CS-IOM-AI module is connected to the Johnson Controls FEC/FAC UI/AO/CO point rather than the IOM or any other extension modules.



Load macro in CCT

1. Prepare one file named CS-IOM-AO1.caf.module file

(The download address: <u>www.cs-controls.com</u>).

- 2. Please save the CS-IOM-AO1.caf.module file to the following path:
- (1) C:\Users\All Users\Johnson Controls\MetasysIII\CCT\UI\Custom Control Modules

(CCT 5.0 or higher / windows 7)

(2) C:\Documents and Settings\All Users\Application Data\Johnson controls\MetasysIII\CCT\UI\Custom Control Modules

(CCT 5.0 or higher / windows XP)

3. Open the CCT software and create a new system as shown in the right:

🛓 New System	×
System Name System Type	UApp Custom Applications
System Configuration	Electrical
System of Units	Metric
	OK Cancel Help

4. Right-click to build five new DO points in Network Inputs column as shown in the pictures. Pay attention to the point type (Enum).

<u>File View T</u> ools	<u>H</u> elp		
<u>C</u> onfigure	<u>S</u> imulate	Co <u>m</u> mission	
Application			
Control Logic	System		
Net	work Inp <u>uts</u>	Setpo	int/Miscella
	New		
	Inpute		
	inputs		



🧐 🛚 et 🖬	👺 Hetwork Input Selection 🛛 🗙							
				3				
Count	Туре	U	lser Name					
0	CS Input (Boolean)			^				
5	CS Input (Enum)	DO						
0	CS Input (Float)							
			ок	Close				

Network In	outs
D0-1	
DO-2	
DO-3	
DO-4	
D0-5	

5. Add an AO point in the Outputs column and select the Miscellaneous / Analog / 0-10V DC output types.



Outp	ut Selection			
				1
ilter m	nisc			
Count	Application	Function	Data Type 🔻	Signal
0	Miscellaneous	Stage 7 Comm	Binary	100VAC Start St
0	Miscellaneous	Stage 7 Comm	Binary	24VAC Maintain
0	Miscellaneous	Stage 7 Comm	Binary	24VAC Start Stop
0	Miscellaneous	Stage 7 Comm	Binary	24VAC-240VAC
0	Miscellaneous	Stage 7 Comm	Binary	24VAC-240VAC
0	Miscellaneous	Stage 7 Comm	Binary	RT 24VAC-240V
0	Miscellaneous	Stage 8 Comm	Binary	100VAC Maintai
0	Miscellaneous	Stage 8 Comm	Binary	100VAC Start St
0	Miscellaneous	Stage 8 Comm	Binary	24VAC Maintain
0	Miscellaneous	Stage 8 Comm	Binary	24VAC Start Stop
0	Miscellaneous	Stage 8 Comm	Binary	24VAC-240VAC
0	Miscellaneous	Stage 8 Comm	Binary	24VAC-240VAC
0	Miscellaneous	Stage 8 Comm	Binary	RT 24VAC-240V
1	Miscellaneous	Output	Analog	0-10VDC
0	Miscellaneous	Output	Analog	4-20mA
0	Miscellaneous	Output	Analog	RT 0-10VDC
				OK Cancel



6. Right-click to select View Details to modify the parameters. Please pay attention to values marked as green.



🧐 Details												X
Apply Cancel						1AO1						
Attribute	Value	Ur	ni		Inputs							
Object			-		Name	e Standard 4	Default Valu	e Unit	e P	isplay Preci	BACnet	Expo
🗜 Name	1AO				1	Use Attri	0.0			Oths 💌	False	-
Description	Miscellaneous Output				Priority	Use Attri	16			s 🔻	False	-
Setup												
Use Default if Not Reliable	False											
Min Change to Send	Value 1 0.0											
BACnet												
Object Identifier	AO:10550											
Display												
Units	%											
Display Precision	1s		-									
Hardware Setup												
Min Out Value	10.0	%			Outputs							- 1
Max Out Value	90.0	%			Name	Standard 4	Default Valu	e Unit	a Di	isplay Preci	BACnet	Expo
Deadband	0.0	%										
Hardware												
Device Type												
Engineering Values												
Min Value	0	%										
Max Value	32	%										
Change of Value Reporting			Н									
COV Increment	1.0	%										
Use COV Min Send Time	True											
Default State												
Dolinguigh Dofoult	0	~	-									
		,]]-						Close	e H	Help

Under the Hardware Setup Min Out Value is under the 10% and Max Out Value is over 90%, Under engineering max values is 32, and units in the red box on the right side "%" to blank

7. Right-click and add Custom Control Module file in the Output Control Module column.





🥸 Output Contr	ol ∎odule Selection	×							
		2							
Select a module an	Select a module and provide a name								
CS-IOM-A01									
2 Pipe 2 Position Valve v51									
2 Pipe 2 Position V	2 Pipe 2 Position Valve w DA-T Low Limit v51								
2 Pipe FBPD 2 Pos	ition Valve w Low Limit v50								
2 Pipe Proportiona	l Valve v51								
2 Pipe Proportiona	I Valve w DA-T Low Limit v51								
2 Pipe Proportiona	l Valve w Low Limit v51								
Activity									
Block Protect									
Blocking Protection	1	-							
User Name	CS-IOM-A01								
Standard Name	Custom	-							
	ок	ancel							

8. Select Connection column and make corresponding connection of DO1~5 one by one.

Features									Ľ
Parameters Connections	State Tabl	es Display	Advanced	BACnet Exposed	Balancer				
Connections - CS-IOM-AO1									
Source					CS-IOM-A01			Destination	
Block		I	Port		Input		Output	Port	Block
D01		[001		D01-0	f	AO1 - 0.0	11	140
D02		[002		D02 - 0	f			
D03		[DO3		D03 - 0	f			
D04		[004		DO4 - 0	f			
D05		[005		D05 - 0	f			

By following the steps above, the PC monitoring system can remotely monitor and control the digital input channels: DO1~DO5.

For the second set of output module, use the CS-IOM-AO2 macro to correspond port name AO1 into AO2 and DO1~5 into DO6~10.



9. In addition to the remote monitor function, the user need control extended digital output ports in the native (DDC controller), which requires further settings.

Similar applications need a simple wind machine start and stop control logic, as shown below.



First, establish a digital output of Enum Output type in the Network Outputs, name it SF-C, and bind with the logic of the output. Then, right-click on SF-C and select View Details, open the settings window.

					🖁 Details		
					Edit		
					Attribute	Value	e
					Object		
				U	Name	SF-C	
		Netw	ork Output	s	Description		
P				-	Object Identifier	MV:10152	
	SF-	-C			Setup		
		Delete	Delete		BACnet Exposed	True	-
		Rename	F2		Dofault Value	07	
		View Details.			Delauti value	ОП	•
		FIGH DOTAILOR			Failsoft	False	-
					Display	L	

Object Identifier MV: 10152 identifies the object record of SF-C.

10. In the Define Network Settings window, the controller address is found in the Network Settings bar.

August and Anali	Point Assignment	Network Settings	Packages	Default Cor	ntroller	
Field Device & Bus	Settings		SA B	s Device (Settings	
1	Andet MS-FEC26	XXX		Name	Address +	Туре
P	ame: FEC26		Local	Display	3	LocalDisplay
Device Add	dress: 4					
Instance Number (BACn	et ID): 4					
		Advanced				
	1		-			



11. Bind User logic output SF-C with extended digital outputs DO-1 (arbitrary DO-1~10). Right-click DO-1, select View Details:

Application				
Control Logic	System			
Ne	twork Inputs			
D0-1		4	2 🛋	
D0-2		Delete	Delete	
		Rename	F2	
00-3		View Details		
DO-4				
DO-5			-	
	Inputs			

Edit peer to peer related settings in the settings window, then modify the MV and device parameters.

Details							
Edit	DO-1						
Attribute		Value					
Object							
Name	DO-1	D0-1					
Description							
Object Identifier	MV:10005	MV:10005					
Setup							
BACnet Exposed	True	True					
Default Value	Off	Off					
Failsoft	True	True					
Display							
States Text	Off/On	Off/On					
State Text		Value					
	1	Off					
	2	On					
Peer to Peer							
Peer Reference	Instance Number (BACnet ID) Device:4			Ļ			
	Object Identif	Object Identifier MV:101					
Error Status	Ok						
Restart Options							
Restore Command Priority	Operator	Override					
	✓ Default						
	V Deluan						

Complete the user logic output SF-C connected with the extended digital DO-1 configuration. Controller logic programs and remote PC system can monitor and control the extended digital output points.



NAE monitors extended digital signal channels

This section describes the NAE system monitoring and forcibly extending digital methods.

 Take the fan control system ahead as an example; add FEC devices and specific points in NAE system. When you add a point, do not add Network Output SF-C because we monitor the fan status by DO-1 points. The following figure shows.

	←	\ominus			test	🛅 🗆 🛛
II Items					Online Norm	al
NAE00	S	ummary	Focus	Hardware	Diagnostic	
BACnet Protocol Eng		Status	;	Item	Value	Description
- Eth IP DataLink		_	17	SF-AM	Automatic	CS Input (Enum)
Energy			14	SF-ENA	Off	CS Input (Enum)
Ellergy			12	DO-1	Off	CS Input (Enum)
H- Programming			12	DO-2	Off	CS Input (Enum)
🕀 🚞 Schedule			34	DO-4	Off	CS Input (Enum)
			- 14	DO-3	Off	CS Input (Enum)
even test	1		34	DO-5	Off	CS Input (Enum)
18 05 44			12	AU-1	0#	CS Input (Enum)
SF-AM			34	or-r	Oli	CS Input (Enum)
SF-ENA						
12 00-4						
12 00 0						
SE-F						
BACnet IP1						

2. When forcing fan status remotely is needed, you can right-click DO-1 on NAE, click Command, order a mandatory Operator Override, and select Value to force the fan status.

tem <u>E</u> dit <u>V</u> iew <u>A</u> ction I <u>n</u> sert <u>T</u> ools <u>Q</u> uer	/ Help	MetasysSysAgent Logout
企	(← → test	° 🗆
All Items	AD505-001:NAE00/Field Bus MSTP1.	test 🗙
BACnet Protocol Eng Share a straight of the straigh	Select the command to issue, then click Send. (Specify parameters, if required.)	command n Enum) num) num)
€ Schedule 	Show Command Set All Commands	hum) hum)
e- test	Set State	num)
	Operator Override	us Output
- SF-ENA	Value Off	
	Release Operator Override	
	Release	
	Release All	
AO-1 BACnet IP1	Send Cancel	
AV1		



3. After forcing out to release the current mandatory values, use the release forced order Release Operate Override.



Note: When you release the force, don't choose the command of Release All, it is likely to cause confusion with the semaphore. If you click carelessly and wrongly, you need to find the input of the control logic. In this case, SF-AM or SF-ENA, change it to "Off", then to "On", you can return to normal.