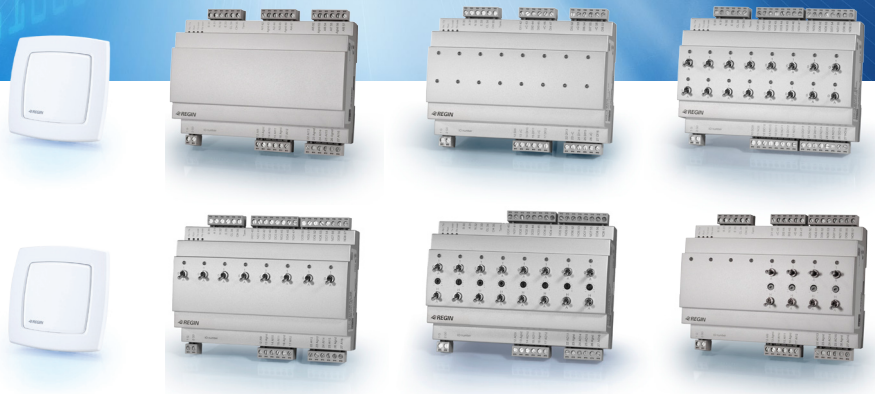




I/O modules in EXO systems



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Chapter 1 I/O modules

There are two types of I/O modules available: A large model with 16 I/O:s, as well as a small model with either 7 or 10 I/O:s.



Fig. 1: Example of the larger I/O module



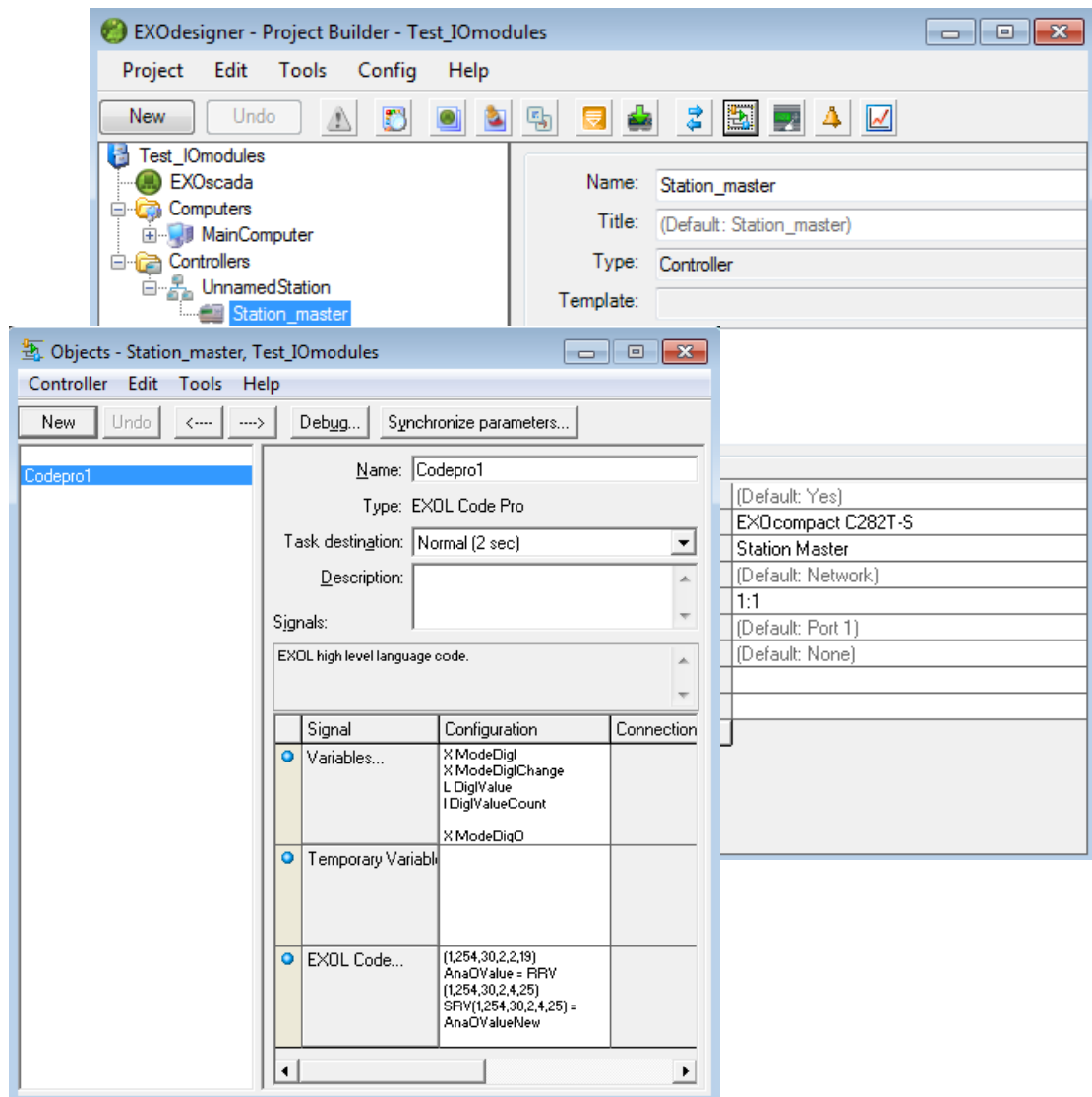
Fig. 2: Example of the smaller I/O module



Integration of the I/O modules into an EXO system is intended for advanced system integrators only. Up to 32 I/O modules can be connected to one controller but the limit is set by the system integrator and the application.

Chapter 2 I/O modules in an EXO project

There are currently no templates available in EXOdesigner for the different I/O modules. When the modules are used in EXO systems, it is therefore necessary to use EXOL code in the master controller in order to read and write to the variables in these models.



The variables available for each I/O module can be found in the appendix of this manual.

In order to follow the same address conventions as normally in EXOdesigner, the PLA address of the I/O slave module should be the same as for the master controller.

Chapter 3 EXOL code

The EXOL commands that can be used to obtain information from the I/O modules are e.g.:

RLV	SLV
RRV	SRV
RXV	SXV
RIV	SIV

The same syntax is used for all commands and is as follows:

```
command(Port number, PLA, ELA, Load number, Segment number, Cell offset)
```

The Load number, Segment number and Cell offset can be found in the appendix of this manual. More information about the syntax and usage of these commands can be found in EXOhelp.

Example using the EXOL Code Pro Object:

Variables:

L DigOutValue1

L DigOutValue2

R AnaInValue

EXOL Code:

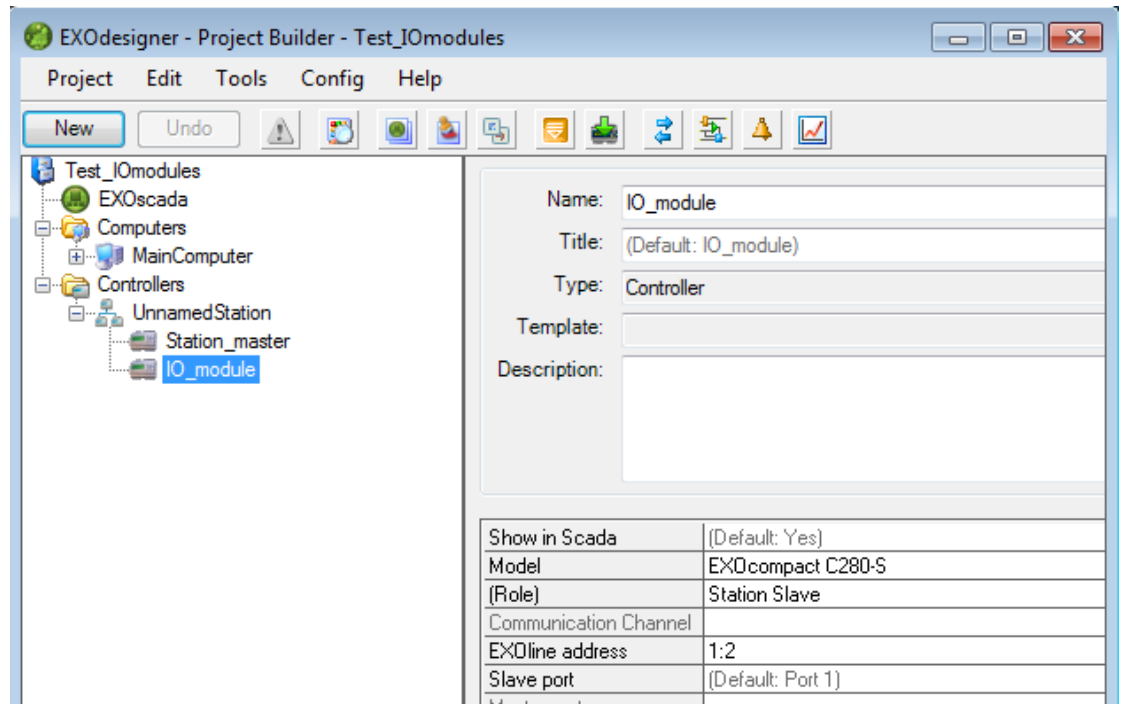
DigOutValue = RLV(1,241,1,2,0,0)

DigOValue2 = RLV(1,241,2,200,0,13)

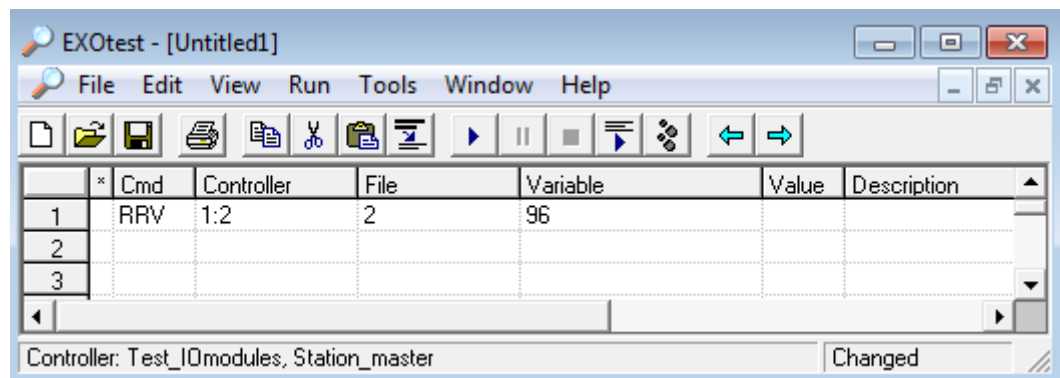
AnaIValue = RRV(1,241,1,2,0,36)

Chapter 4 Debugging with EXOtest

When using EXOtest, such as for debugging purposes, it is recommended that a slave controller (e.g. an EXOcompact) be added under the station master, using the same PLA:ELA as the I/O module. In this way, the communication settings for the I/O module are set automatically.



In EXOtest, use the Load number (File) and the Cell number (Variable) as shown below. These numbers can be found in the appendix of this manual.



Appendix 1

EXOline communication variables

Models with 16 I/O:s

Load number: 2						IO-16AI	IO-16DI	IO-16DO	IO-8DO8AO	IO-8DO8AI	IO-4X4
Segment number	Cell offset	Cell number	Type	Access	Description						
0	0	0	L	read	DI1		X				X
0	1	1	L	read	DI2		X				X
0	2	2	L	read	DI3		X				X
0	3	3	L	read	DI4		X				X
0	4	4	L	read	DI5		X				
0	5	5	L	read	DI6		X				
0	6	6	L	read	DI7		X				
0	7	7	L	read	DI8		X				
0	8	8	L	read	DI9		X				
0	9	9	L	read	DI10		X				
0	10	10	L	read	DI11		X				
0	11	11	L	read	DI12		X				
0											
0	12	12	I	read	Counter1		X				X
0	14	14	I	read	Counter2		X				X
0	16	16	I	read	Counter3		X				X
0	18	18	I	read	Counter4		X				X
0	20	20	I	read	Counter5		X				
0	22	22	I	read	Counter6		X				
0	24	24	I	read	Counter7		X				
0	26	26	I	read	Counter8		X				
0											
0	36	36	R	read	AI1	X				X	X
0	39	39	R	read	AI2	X				X	X
0	42	42	R	read	AI3	X				X	X
0	45	45	R	read	AI4	X				X	X
0	48	48	R	read	AI5	X				X	
0	51	51	R	read	AI6	X				X	
0	54	54	R	read	AI7	X				X	
0	57	57	R	read	AI8	X				X	
1	0	60	L	read	DI13		X				
1	1	61	L	read	DI14		X				
1	2	62	L	read	DI15		X				

Load number: 2						IO-16AI	IO-16DI	IO-16DO	IO-8DO8AO	IO-8DO8AI	IO-4X4
Segment number	Cell offset	Cell number	Type	Access	Description						
1	3	63	L	read	DII6		X				
1											
1	36	96	R	read	AI9	X					
1	39	99	R	read	AI10	X					
1	42	102	R	read	AI11	X					
1	45	105	R	read	AI12	X					
1	48	108	R	read	AI13	X					
1	51	111	R	read	AI14	X					
1	54	114	R	read	AI15	X					
1	57	117	R	read	AI16	X					
2	0	120	X	read	SW1 DO (0:OFF 1:ON 2:Auto)			X	X	X	X
2	1	121	X	read	SW2 DO			X	X	X	X
2	2	122	X	read	SW3 DO			X	X	X	X
2	3	123	X	read	SW4 DO			X	X	X	X
2	4	124	X	read	SW5 DO			X	X	X	
2	5	125	X	read	SW6 DO			X	X	X	
2	6	126	X	read	SW7 DO			X	X	X	
2	7	127	X	read	SW8 DO			X	X	X	
2	8	128	X	read	SW9 DO			X			
2	9	129	X	read	SW10 DO			X			
2	10	130	X	read	SW11 DO			X			
2	11	131	X	read	SW12 DO			X			
2	12	132	X	read	SW13 DO			X			
2	13	133	X	read	SW14 DO			X			
2	14	134	X	read	SW15 DO			X			
2	15	135	X	read	SW16 DO			X			
2											
2	16	136	X	read	SW1 AO (1:Manual 2:Auto)				X		X
2	17	137	X	read	SW2 AO				X		X
2	18	138	X	read	SW3 AO				X		X
2	19	139	X	read	SW4 AO				X		X
2	20	140	X	read	SW5 AO				X		
2	21	141	X	read	SW6 AO				X		
2	22	142	X	read	SW7 AO				X		
2	23	143	X	read	SW8 AO				X		
3	0	180	X	write	AIMode1 (1:PT1000 6:0-10 kOhm 7:M-sensor 9:0...10V 11:0...20mA)	X				X	X
3	1	181	X	write	AIMode2	X				X	X

Load number: 2						IO-16AI	IO-16DI	IO-16DO	IO-8DO8AO	IO-8DO8AI	IO-4X4
Segment number	Cell offset	Cell number	Type	Access	Description						
3	2	182	X	write	AIMode3	X				X	X
3	3	183	X	write	AIMode4	X				X	X
3	4	184	X	write	AIMode5	X				X	
3	5	185	X	write	AIMode6	X				X	
3	6	186	X	write	AIMode7	X				X	
3	7	187	X	write	AIMode8	X				X	
3	8	188	X	write	AIMode9	X					
3	9	189	X	write	AIMode10	X					
3	10	190	X	write	AIMode11	X					
3	11	191	X	write	AIMode12	X					
3	12	192	X	write	AIMode13	X					
3	13	193	X	write	AIMode14	X					
3	14	194	X	write	AIMode15	X					
3	15	195	X	write	AIMode16	X					
3											
3	16	196	X	write	DIMode1 (0:Contact 1:Counter)		X				X
3	17	197	X	write	DIMode2		X				X
3	18	198	X	write	DIMode3		X				X
3	19	199	X	write	DIMode4		X				X
3	20	200	X	write	DIMode5		X				
3	21	201	X	write	DIMode6		X				
3	22	202	X	write	DIMode7		X				
3	23	203	X	write	DIMode8		X				
4	0	240	L	write	DQ1			X	X	X	X
4	1	241	L	write	DQ2			X	X	X	X
4	2	242	L	write	DQ3			X	X	X	X
4	3	243	L	write	DQ4			X	X	X	X
4	4	244	L	write	DQ5			X	X	X	
4	5	245	L	write	DQ6			X	X	X	
4	6	246	L	write	DQ7			X	X	X	
4	7	247	L	write	DQ8			X	X	X	
4	8	248	L	write	DQ9			X			
4	9	249	L	write	DQ10			X			
4	10	250	L	write	DQ11			X			
4	11	251	L	write	DQ12			X			
4	12	252	L	write	DQ13			X			
4	13	253	L	write	DQ14			X			
4	14	254	L	write	DQ15			X			
4	15	255	L	write	DQ16			X			
4											
4	16	256	R	write	AQ1				X		X
4	19	259	R	write	AQ2				X		X
4	22	262	R	write	AQ3				X		X
4	25	265	R	write	AQ4				X		X

Load number: 2						IO-16AI	IO-16DI	IO-16DO	IO-8DO8AO	IO-8DO8AI	IO-4X4
Segment number	Cell offset	Cell number	Type	Access	Description						
4	28	268	R	write	AQ5				X		
4	31	271	R	write	AQ6				X		
4	34	274	R	write	AQ7				X		
4	37	277	R	write	AQ8				X		
0	0	0	X	write	PLA	X	X	X	X	X	X
0	1	1	X	write	ELA	X	X	X	X	X	X
0	16	16	X	write	VerMinor	X	X	X	X	X	X
0	17	17	X	write	VerMajor	X	X	X	X	X	X
0	36	36	I	write	Modeltype	X	X	X	X	X	X
0	40	40	X	write	VerBranch	X	X	X	X	X	X
0	41	41	X	write	Revision	X	X	X	X	X	X

Models with 7 or 10 I/O:s

Load number: 2						IO-RU-7	IO-RU-10
Segment number	Cell offset	Cell number	Type	Access	Description		
0	0	0	L	read	DI1	X	X
0	1	1	L	read	DI2	X	X
0	2	2	L	read	DI3	X	X
0	12	12	I	read	DigIn1Count	X	X
0	14	14	I	read	DigIn2Count	X	X
0	16	16	I	read	DigIn3Count	X	X
0	36	36	R	read	AI1	X	X
0	39	39	R	read	AI2	X	X
0	42	42	R	read	AI3	X	X
		60	R	r/w	DigOut1Pulse	X	X
		63	R	r/w	DigOut2Pulse	X	X
		66	R	r/w	DigOut3Pulse	X	X
		69	R	r/w	DigOut4Pulse		X
		72	R	r/w	DigOut5Pulse		X
		75	R	r/w	DigOut6Pulse		X
		81	X	r/w	DO1_CONF	X	X
		82	X	r/w	DO2_CONF	X	X
		83	X	r/w	DO3_CONF	X	X
		84	X	r/w	DO4_CONF		X
		85	X	r/w	DO5_CONF		X
		86	X	r/w	DO6_CONF		X
		88	R	r/w	DigOut1PulseTime	X	X
		91	R	r/w	DigOut2PulseTime	X	X
		94	R	r/w	DigOut3PulseTime	X	X
		97	R	r/w	DigOut4PulseTime		X
		100	R	r/w	DigOut5PulseTime		X
		103	R	r/w	DigOut6PulseTime		X
		109	X	r/w	NoOfDigIn	X	X
		110	X	r/w	NoOfDigOut	X	X
		111	X	r/w	NoOfAnaIn	X	X
		112	X	r/w	NoOfAnaOut	X	X
		113	X	r/w	DI1_CONF	X	X
		114	X	r/w	DI2_CONF	X	X
		115	X	r/w	DI3_CONF	X	X
		125	X	r/w	UO1_CONF	X	X
		126	X	r/w	UO2_CONF	X	X
		127	X	r/w	UO3_CONF	X	

Load-number: 241						IO-RU-7	IO-RU-10
Segment number	Cell offset	Cell number	Type	Access	Description		
		0	X	r/w	PLA	X	X
		1	X	r/w	ELA	X	X
		16	X	read	VerMinor	X	X
		17	X	read	VerMajor	X	X
		36	I	read	Model	X	X
		40	X	read	VerBranch	X	X
		41	X	read	Revision	X	X

Load number: 200						IO-RU-7	IO-RU-10
Segment number	Cell offset	Cell number	Type	Access	Description		
		0	X	read	AllDI	X	X
		13	L	read	DI1	X	X
		14	L	read	DI2	X	X
		15	L	read	DI3	X	X
		47	L	r/w	DQ1	X	X
		48	L	r/w	DQ2	X	X
		49	L	r/w	DQ3	X	X
		50	L	r/w	DQ4		X
		51	L	r/w	DQ5		X
		52	L	r/w	DQ6		X

Load number: 201						IO-RU-7	IO-RU-10
Segment number	Cell offset	Cell number	Type	Access	Description		
		1	X	read	AIMode1	X	X
		2	X	read	AIMode2	X	X
		3	X	read	AIMode3	X	X
		18	R	read	AI1	X	X
		21	R	read	AI2	X	X
		24	R	read	AI3	X	X

Load number: 202						IO-RU-7	IO-RU-10
Segment number	Cell offset	Cell number	Type	Access	Description		
		16	R	r/w	AQ1	X	X
		19	R	r/w	AQ2	X	X
		22	R	r/w	AQ3	X	

AB Regin

Head office

Box 116, S-428 22 Källered,
Sweden

Phone: +46 31 720 02 00

Fax: +46 31 720 02 50

info@regin.se

www.regincontrols.com



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