Virtual IOC Emulator for Version 100

2 Automatic Road, Suite 108
Brampton, Ontario
Canada L6S 6K8

Email : support@rbh-access.com Web : www.rbh-access.com

Table of Contents

Changes to original AXIF protocol 2
Connection 2
Axiom Alarm Panel Interface Protocol 3
DIP-Switch Settings *3*
Protocol 4
Input Number *4*
State *4*
Firmware Upgrade 5
Status LEDs 5
Output Protocol 6
Multiple Connections 6

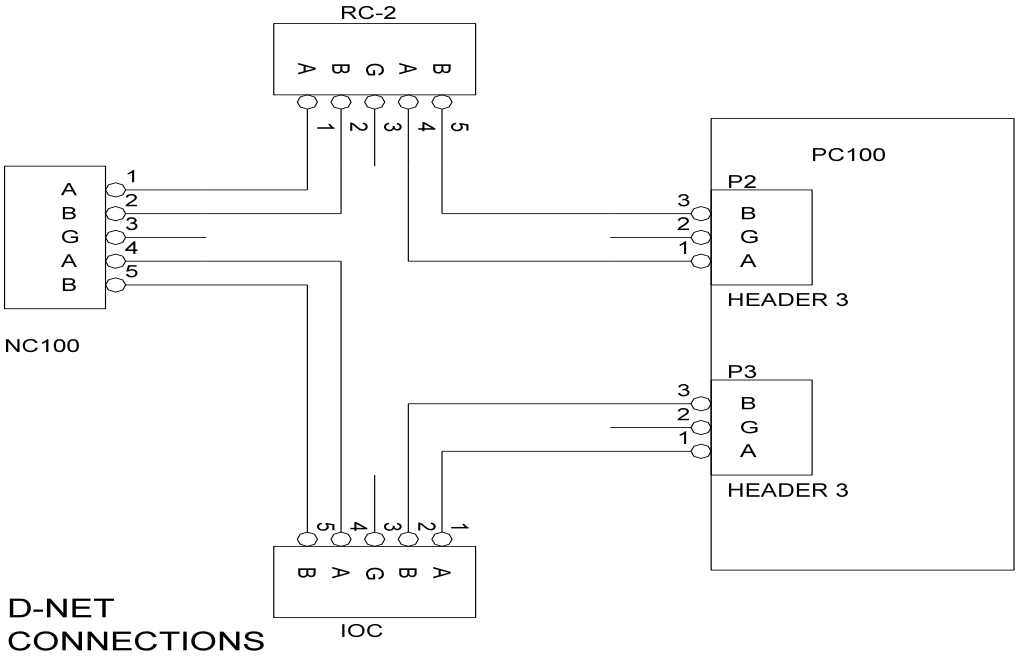
Changes to original AXIF protocol

PC100 version 100 is required for this.
To accommodate 2,560 inputs/outputs several changes have been made. Input and output values have increased from 3 digit values to 4 digit values.

Connection

Connect CH1 and CH2 to the NC100 D-NET in a loop topology along with other D-NET devices. The Host connection can connect to CH4's RS232 or RS485 connections. The PC100 TX output on CH4 is only used when outputs have been assigned to the Virtual IOC16's and there are output messages from the Axiom network.

Baud Rate – 9600 8 bits no parity	Power – 12VDC 120mA



Axiom Alarm Panel Interface Protocol

The Axiom Alarm Panel Interface consists of a PC100 board programmed to emulate a number of IOC16s when connected to an Axiom NC100 via the D-Net. The starting address and ending address are programmed via the front panel dip-switches.
The emulated IOCs act as inputs to the network and will present the various states and configurations that a normal IOC would do. If configured as an input, commands sent through the host channel will generate messages into the Axiom system. If configured as an output, output control messages will be sent to the host from the Axiom system. A simple protocol has been designed that allows foreign vendors an opportunity to interface to the Axiom Access Control System by messages to the RS232 or RS485 port on the PC100.

DIP-Switch Settings

The Axiom Access Control System starts its IOC addresses at address 5 and can support up to sixteen devices ending at address 20. To make the DIP-switches capable of selecting the range of addresses to which the emulator will respond, an offset address scheme has been developed. The first four switches create the start offset and the last four switches create the end offset. **Desired Address = DIP address + 5**. The device when polled will answer any address that falls between the desired start and end addresses (inclusive). If the end address is smaller than (or equal to) the start address only the start address will be used.

DIP-Switch Selection Table (0 = off, 1 = on)

Start				Desired	End			
S1	**S2**	**S3**	**S4**	**Address**	**S5**	**S6**	**S7**	**S8**
0	0	0	0	**5**	0	0	0	0
1	0	0	0	**6**	1	0	0	0
0	1	0	0	**7**	0	1	0	0
1	1	0	0	**8**	1	1	0	0
0	0	1	0	**9**	0	0	1	0
1	0	1	0	**10**	1	0	1	0
0	1	1	0	**11**	0	1	1	0
1	1	1	0	**12**	1	1	1	0
0	0	0	1	**13**	0	0	0	1
1	0	0	1	**14**	1	0	0	1
0	1	0	1	**15**	0	1	0	1
1	1	0	1	**16**	1	1	0	1
0	0	1	1	**17**	0	0	1	1
1	0	1	1	**18**	1	0	1	1
0	1	1	1	**19**	0	1	1	1
1	1	1	1	**20**	1	1	1	1

Protocol

The protocol is ASCII based C/R delimited with fixed length.

Fixed Text	Input Number	State	Fixed Text
	0001 – 2560	0 = Restore 1 = Alarm 2 = Trouble 3 = Illegal	C/R
RBH	Nnnn	s	(0x0d)

Input Number

Input numbers are translated into panel IDs and input IDs through a fixed table. Event messages will only be sent for those panels whose addresses are within the parameters defined by the address DIP-switches.

		Panel ID															
		5	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
	1	1	17	33	49	65	81	97	113	129	145	161	177	193	209	225	241
	2	2	18	34	50	66	82	98	114	130	146	162	178	194	210	226	242
	3	3	19	35	51	67	83	99	115	131	147	163	179	195	211	227	243
	4	4	20	36	52	68	84	100	116	132	148	164	180	196	212	228	244
I	**5**	5	21	37	53	69	85	101	117	133	149	165	181	197	213	229	245
N	**6**	6	22	38	54	70	86	102	118	134	150	166	182	198	214	230	246
P	**7**	7	23	39	55	71	87	103	119	135	151	167	183	199	215	231	247
U	**8**	8	24	40	56	72	88	104	120	136	152	168	184	200	216	232	248
T	**9**	9	25	41	57	73	89	105	121	137	153	169	185	201	217	233	249
	10	10	26	42	58	74	90	106	122	138	154	170	186	202	218	234	250
	11	11	27	43	59	75	91	107	123	139	155	171	187	203	219	235	251
	12	12	28	44	60	76	92	108	124	140	156	172	188	204	220	236	252
	13	13	29	45	61	77	93	109	125	141	157	173	189	205	221	237	253
	14	14	30	46	62	78	94	110	126	142	158	174	190	206	222	238	254
	15	15	31	47	63	79	95	111	127	143	159	175	191	207	223	239	255
	16	16	32	48	64	80	96	112	128	144	160	176	192	208	224	240	256

State

A change in state will cause an appropriate log message to be transferred to the Axiom Access Control System. When an input is armed by the Axiom System only alarm and

restore messages are available. Virtual Inputs have all the same software features as regular inputs. This includes links, operator commands, and schedules (the only programming that is irrelevant is *circuit type*).

Available Events

State Value	Armed	Disarmed
0	Restore	Normal
1	Alarm	Abnormal
2	Alarm	Trouble
3	Alarm	Illegal

Firmware Upgrade

It is anticipated that the protocol will change according to manufacturer requirements. A method of upgrading firmware for this purpose is available in the latest version of Axiom software (Service Pack 5 [5.2.14] 5-Apr-07). By selecting only one of the emulated IOCs for a device firmware upgrade the firmware will be overwritten with a selected RBH file.

It takes approximately two minutes for the upgrade to be completed.

Be sure to use the proper firmware file when upgrading a virtual IOC board. A regular IOC firmware file will not work in a virtual IOC (and vice versa). If this does happen the only way to correct the situation will be to replace the firmware chip.

Status LEDs

L1 – red – Alarm Interface status

Normally off, L1 indicates that a message has been accepted by the interface. When it is flashing it indicates that a firmware upgrade is taking place.

L2 – green – Axiom Interface status

Normally flashing at a rate of once a second, L2 will flash twice as fast if the unit is offline with the Axiom Device network.

Communication Channel LEDs

Each communication channel has a green transmit LED and a red receive LED.

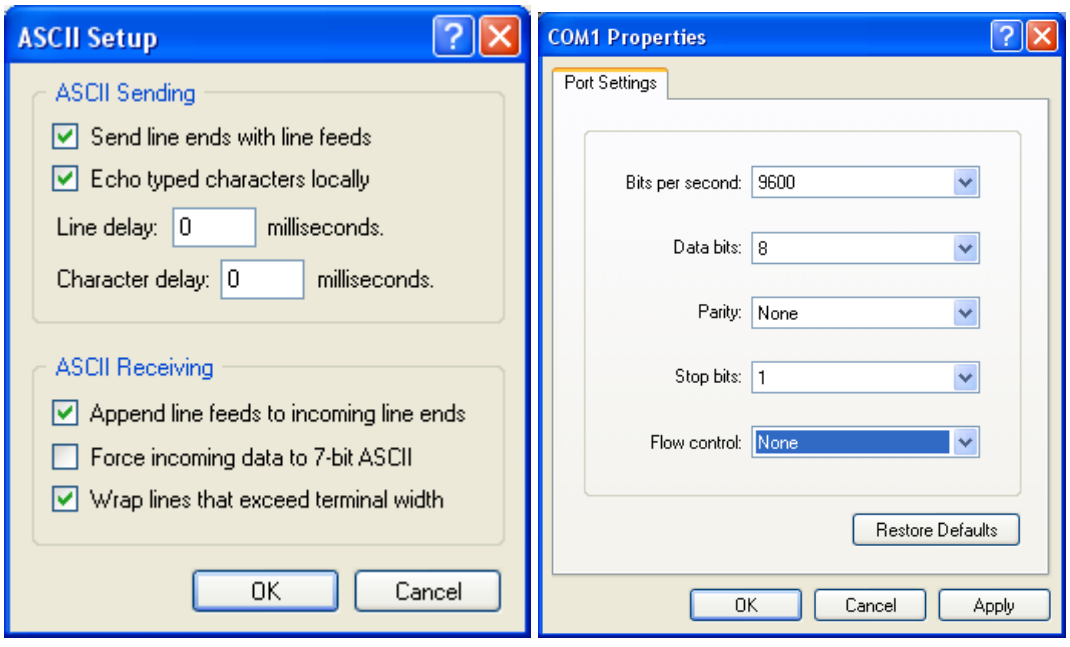
Output Protocol

Whenever the NC100 issues a command to turn on or off an output the host channel will transmit a message using the following protocol.

Fixed Text	Output Number	State	Fixed Text
	0001-2560	0 = Off 1 = On	C/R
Out	nnnn	s	(0x0d)

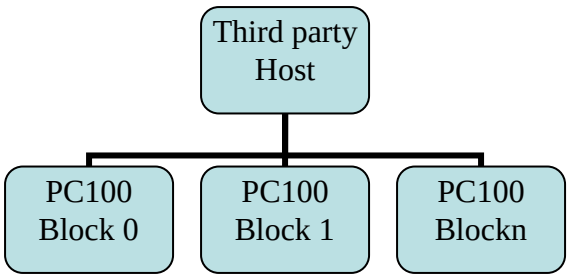
Multiple Connections

The Axiom NC100 can only handle 256 inputs/outputs so a method has been devised that allows multiple NC100's to be connected to the network. By connecting all of the receive RS232 lines together each PC100 will receive the same input commands but will ignore values out of range. The range is determined by sending a "SET" command that is stored in non-volatile memory.
The SET command sets the block value. To program the block number set your hyper-terminal port to the following values: 9600 baud – 8 bits no parity.



Only connect one panel at a time to the hyper-terminal port when programming the block number to prevent all panels from assuming the same value.

Type SETn <c/r> where n = 0-9. To confirm your selection Type “GET<c/r> and if the PC100 transmit line is connected it will report “BLOCK n”.



Each PC100 can be assigned a block of 256 inputs according to the following table:

Block	Input Range
0	0001 - 0256
1	0257 – 0512
2	0513 - 0768
3	0769 - 1024
4	1025 - 1280
5	1281 - 1536
6	1537 - 1792
7	1793 - 2048
8	2049 - 2304
9	2305 - 2560