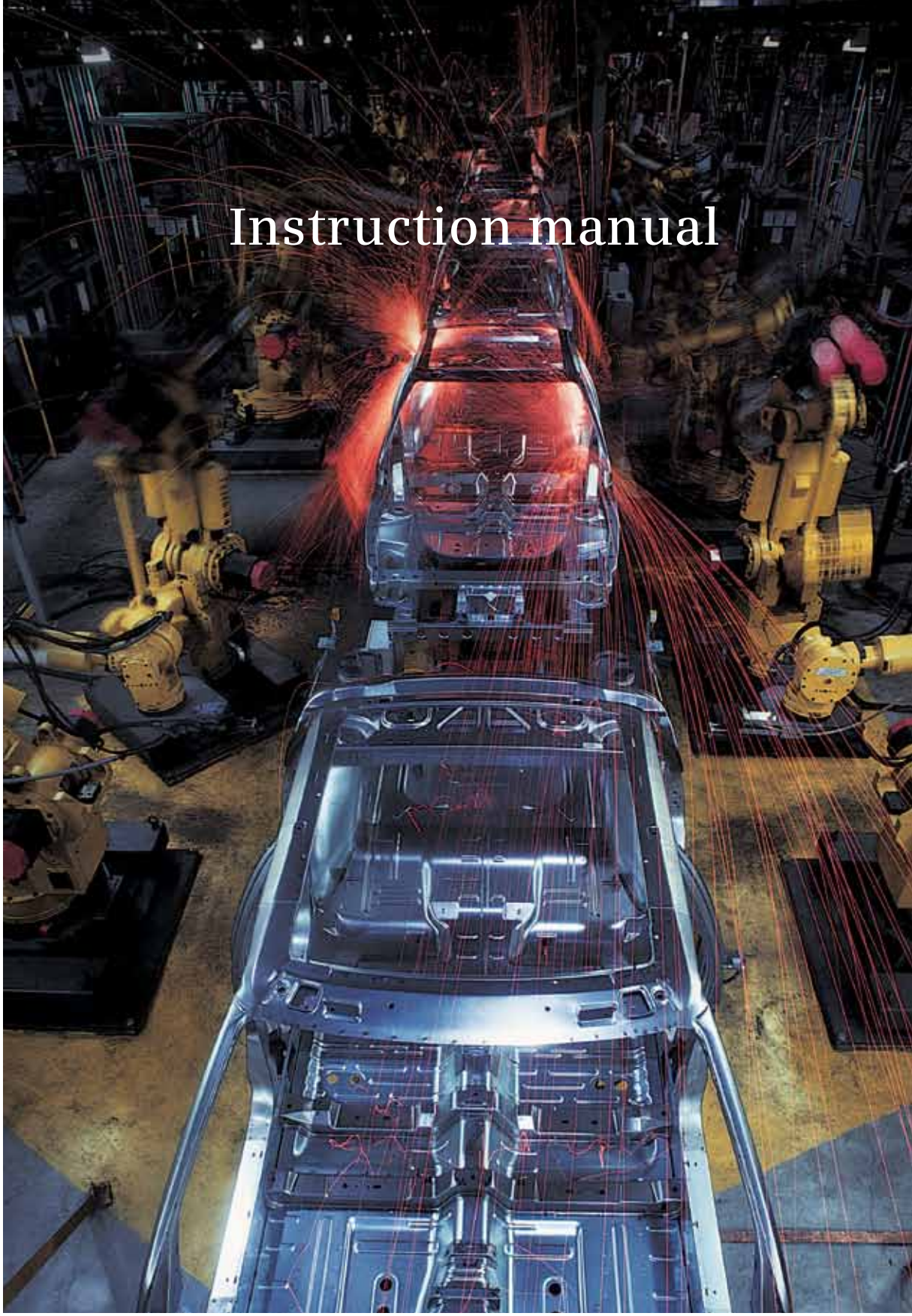
Instruction manual



Siemens tiastar™ Gateway Unit

www.usa.siemens.com

SIEMENS

Contents

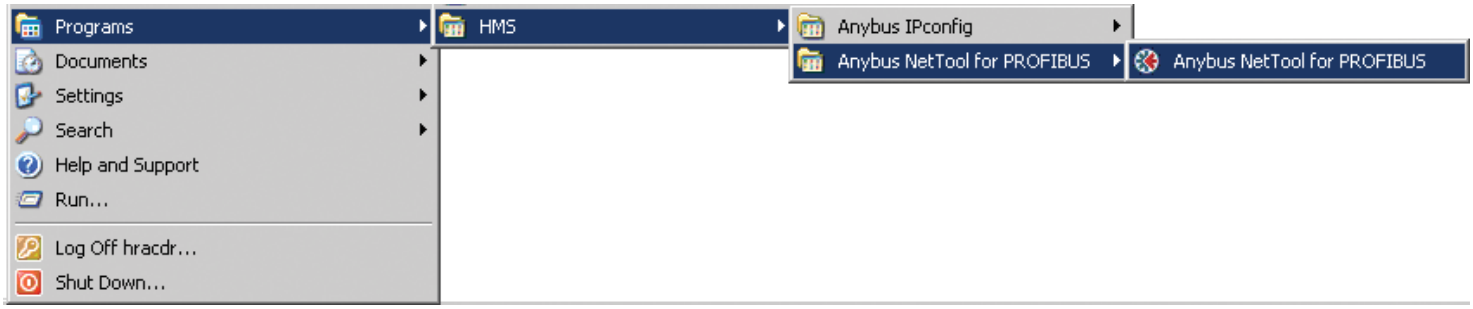
1. Introduction

This manual documents how to:

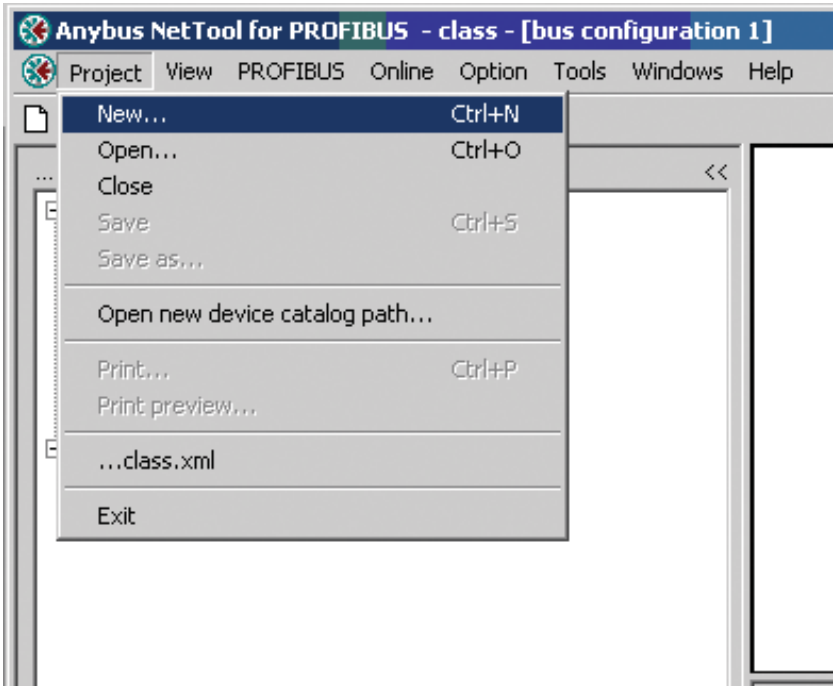
Configure	Configure the profibus network configuration for the MCC,and configure the gateway itself for operation. *This involves the following steps:* • Connect to the gateway using HYPERTERMINAL and configuring operation • Create the Profibus network configuration of the MCC
Download	Download the Profibus configuration to the gateway.
Verify	Verify the proper operation of the gateway.

2. Configure Profibus Network for Gateway

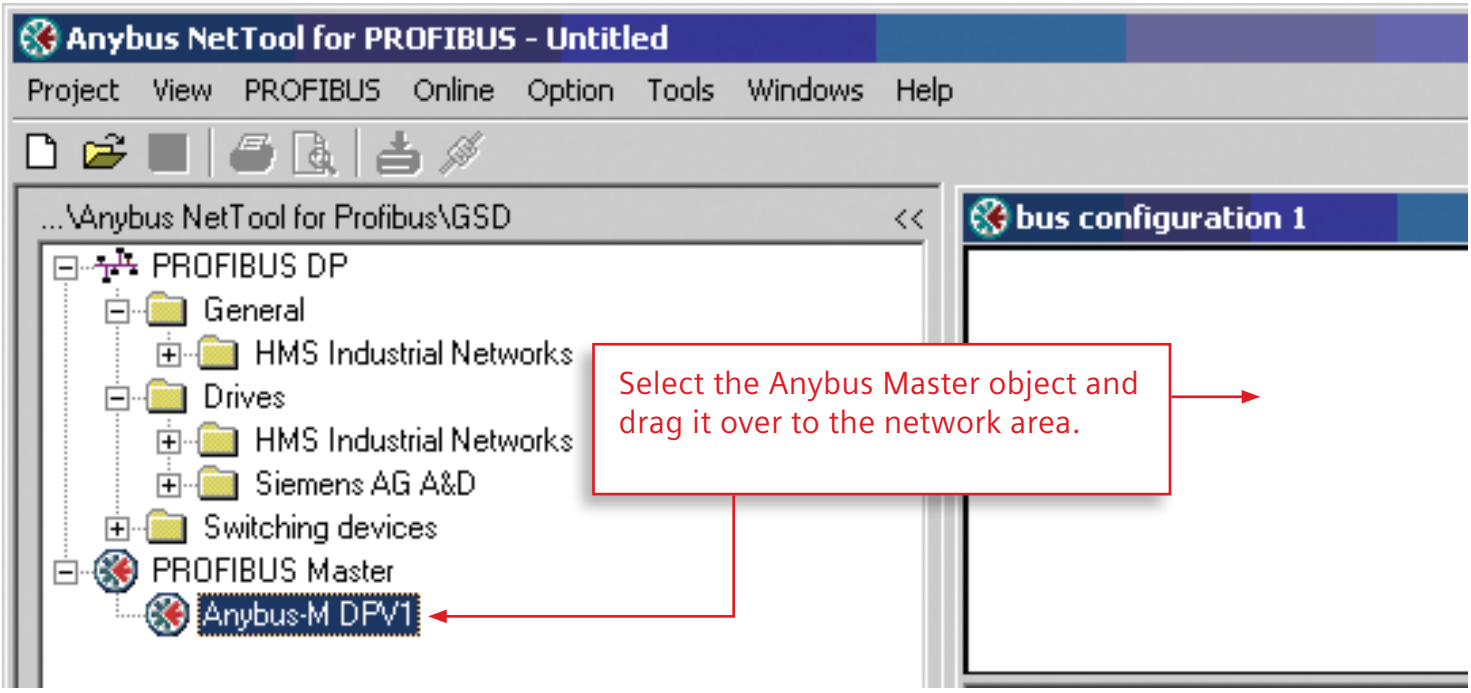
The program we will be using is:

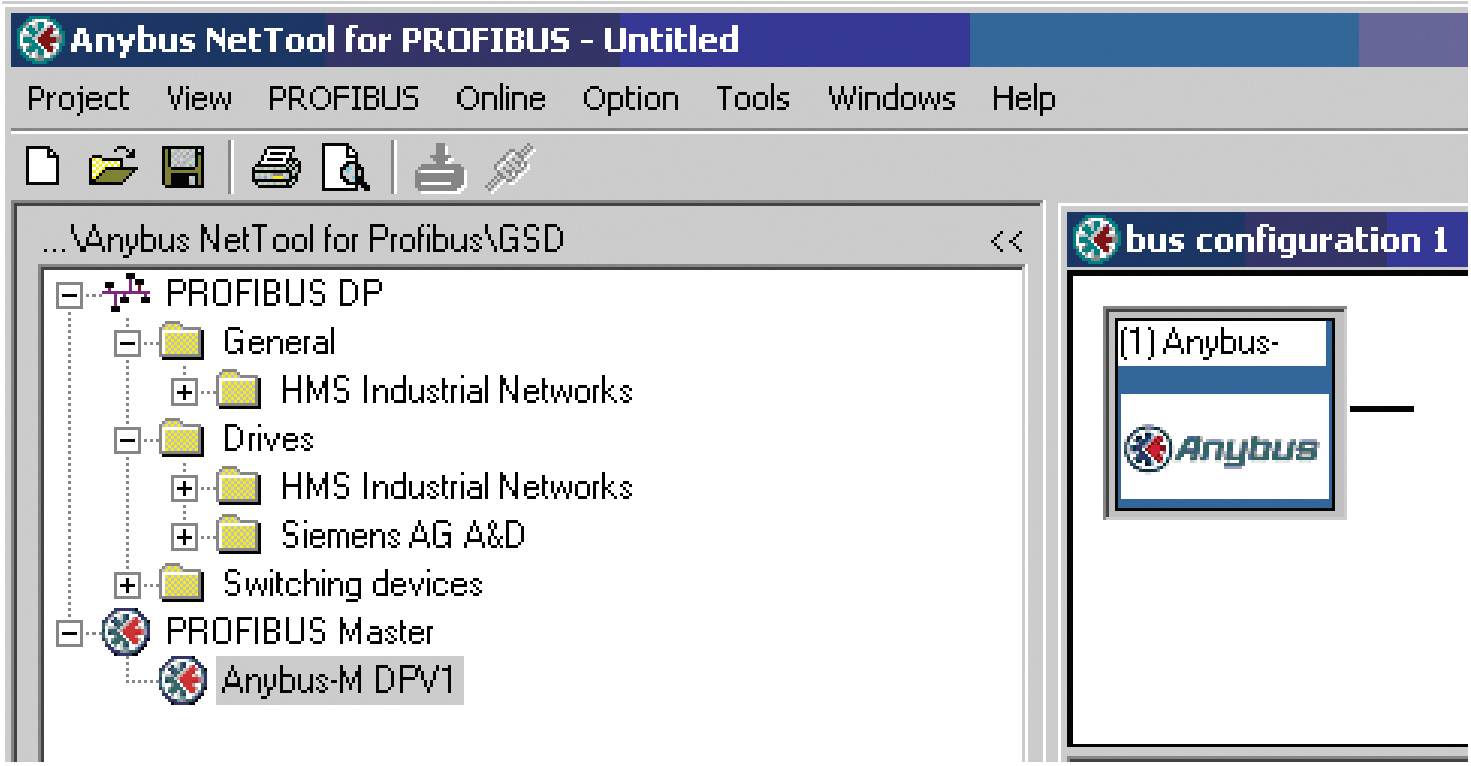


2.1. Step 1: Create a new project

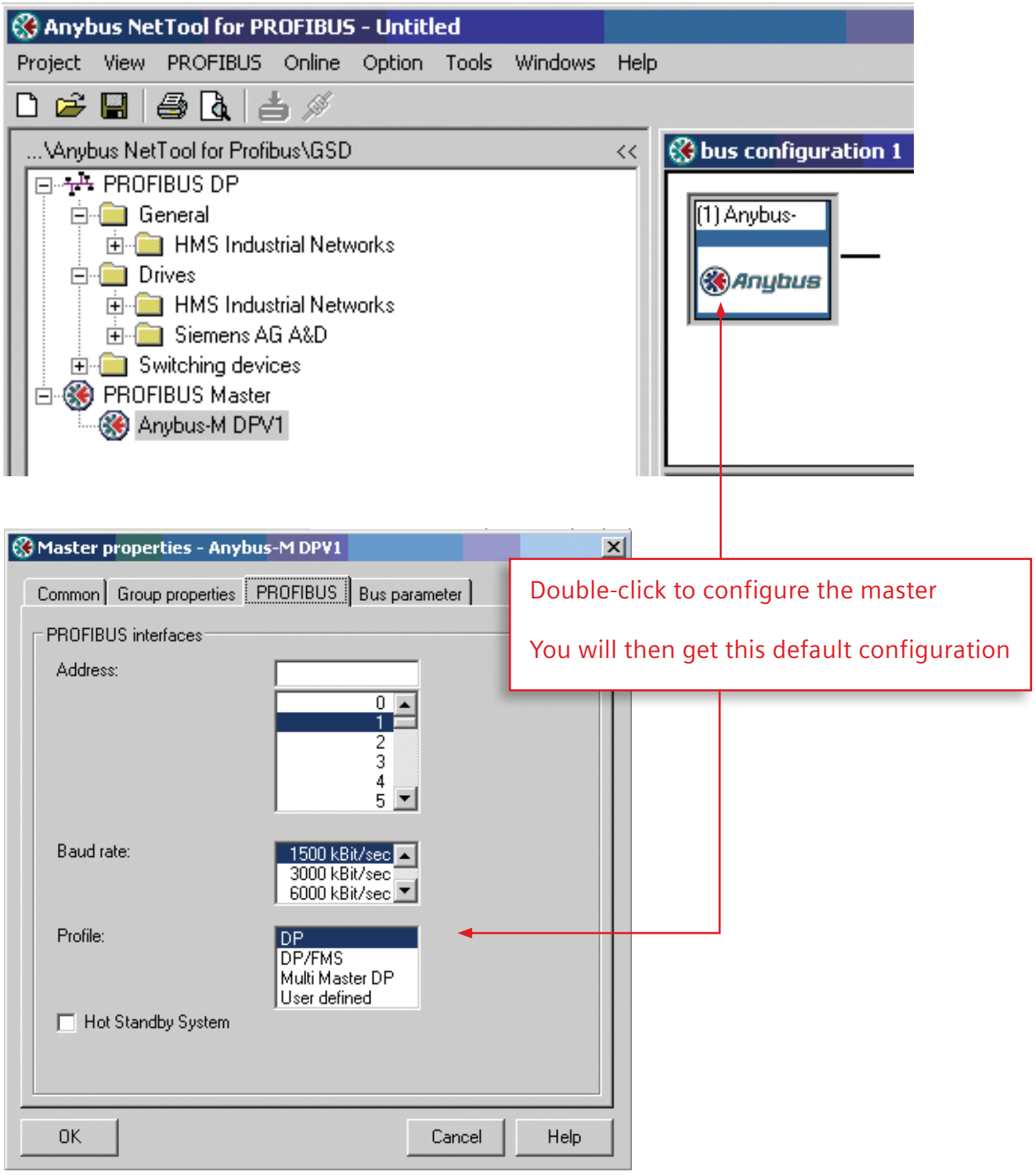


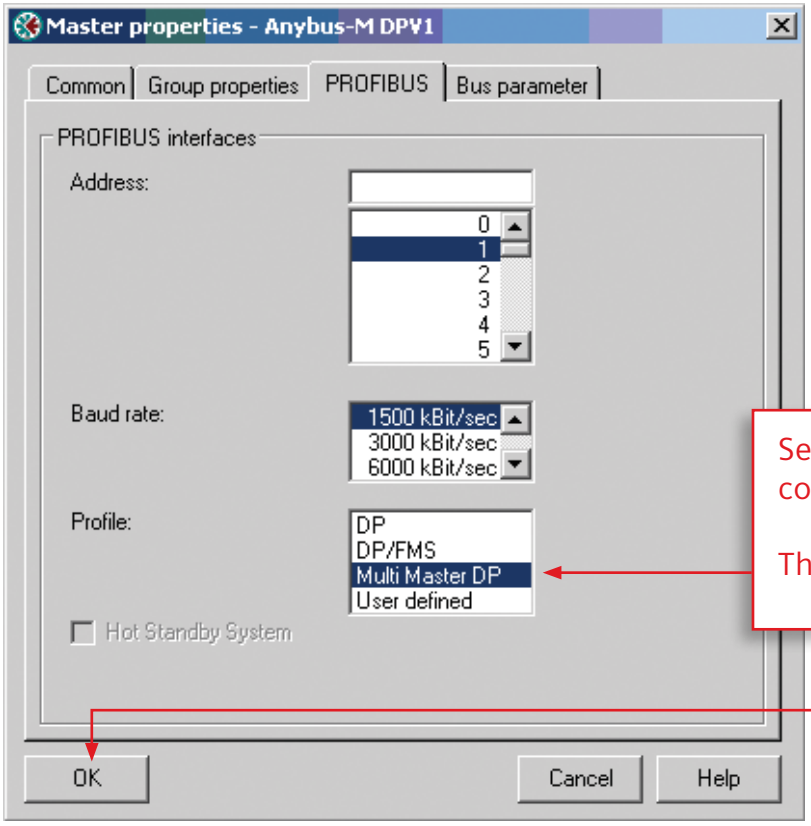
2.2. Step 2: Add the Master Unit





2.3. Step 3: Configure the Master

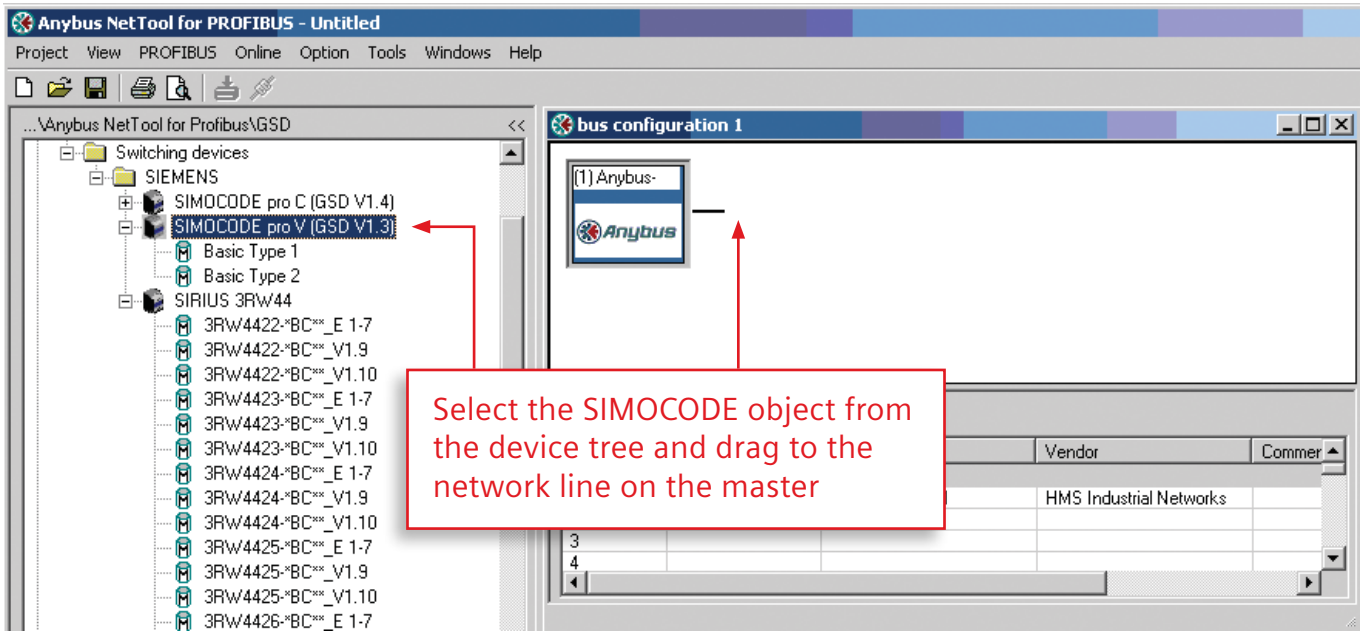




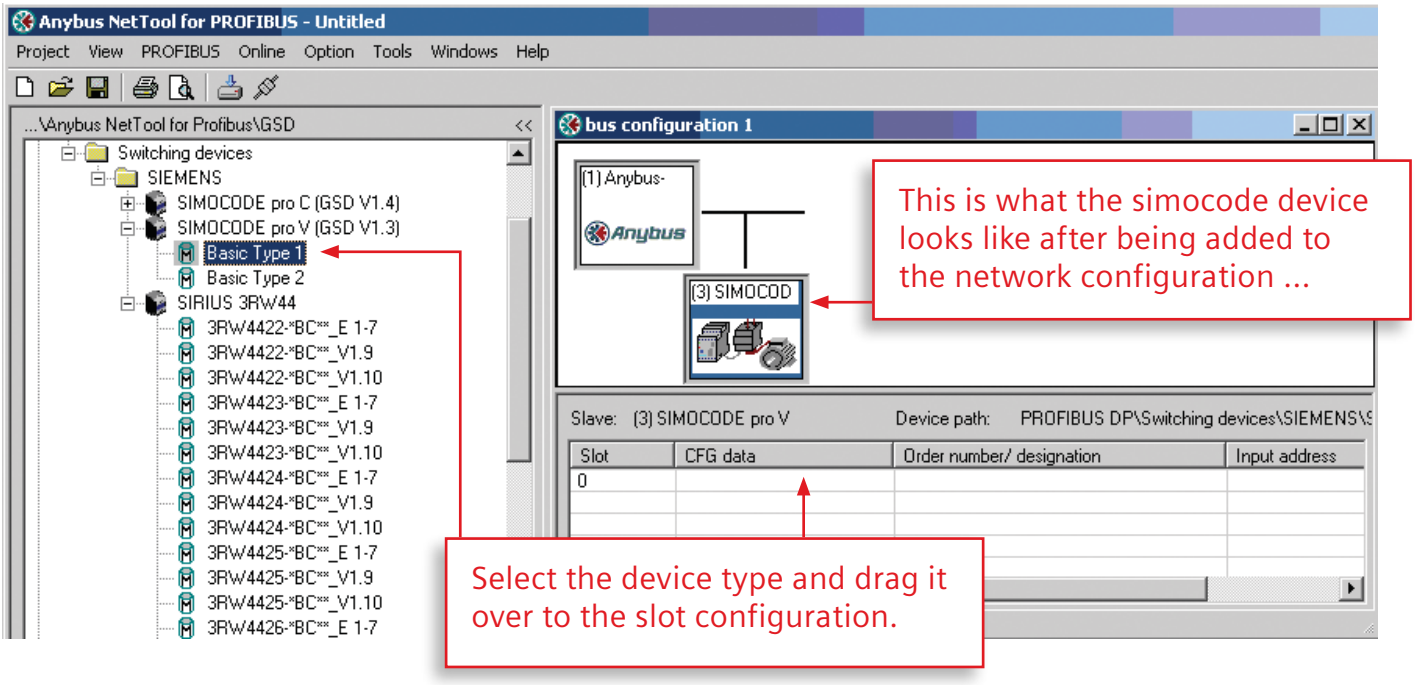
Select the MULTI-MASTER DP configuration setting

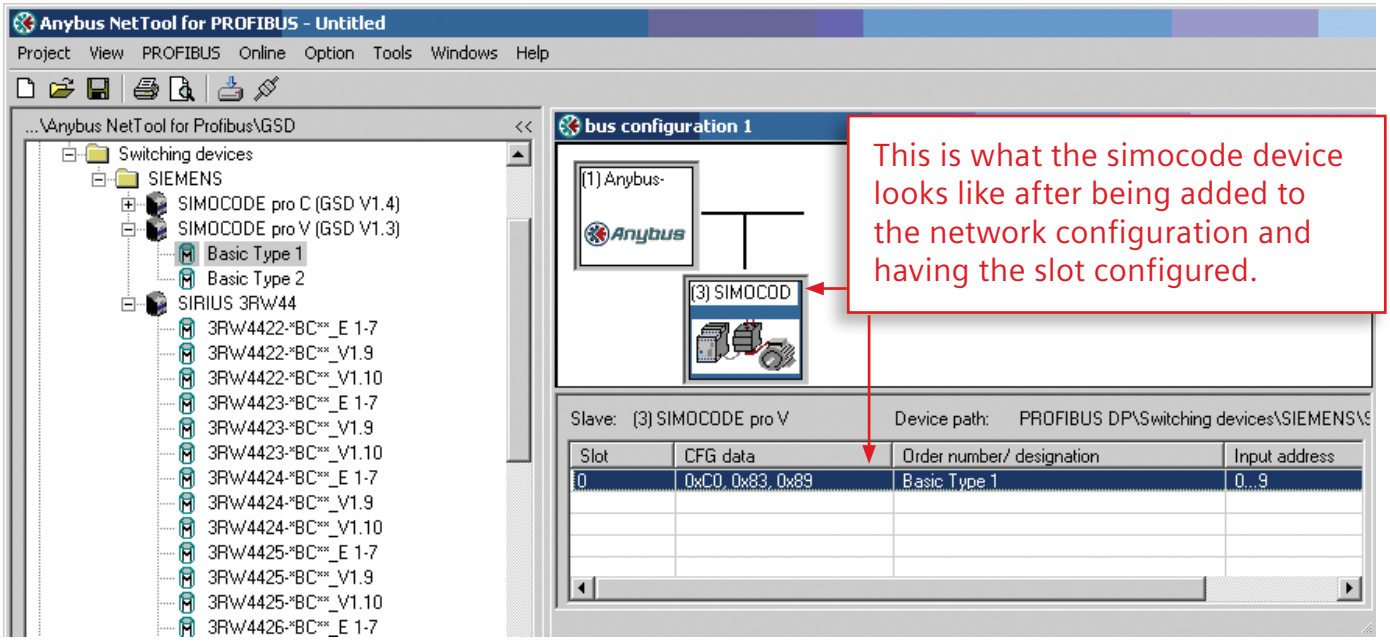
Then save it by pressing OK

2.4. Step 4: Add a Simocode Pro to the hardware configuration



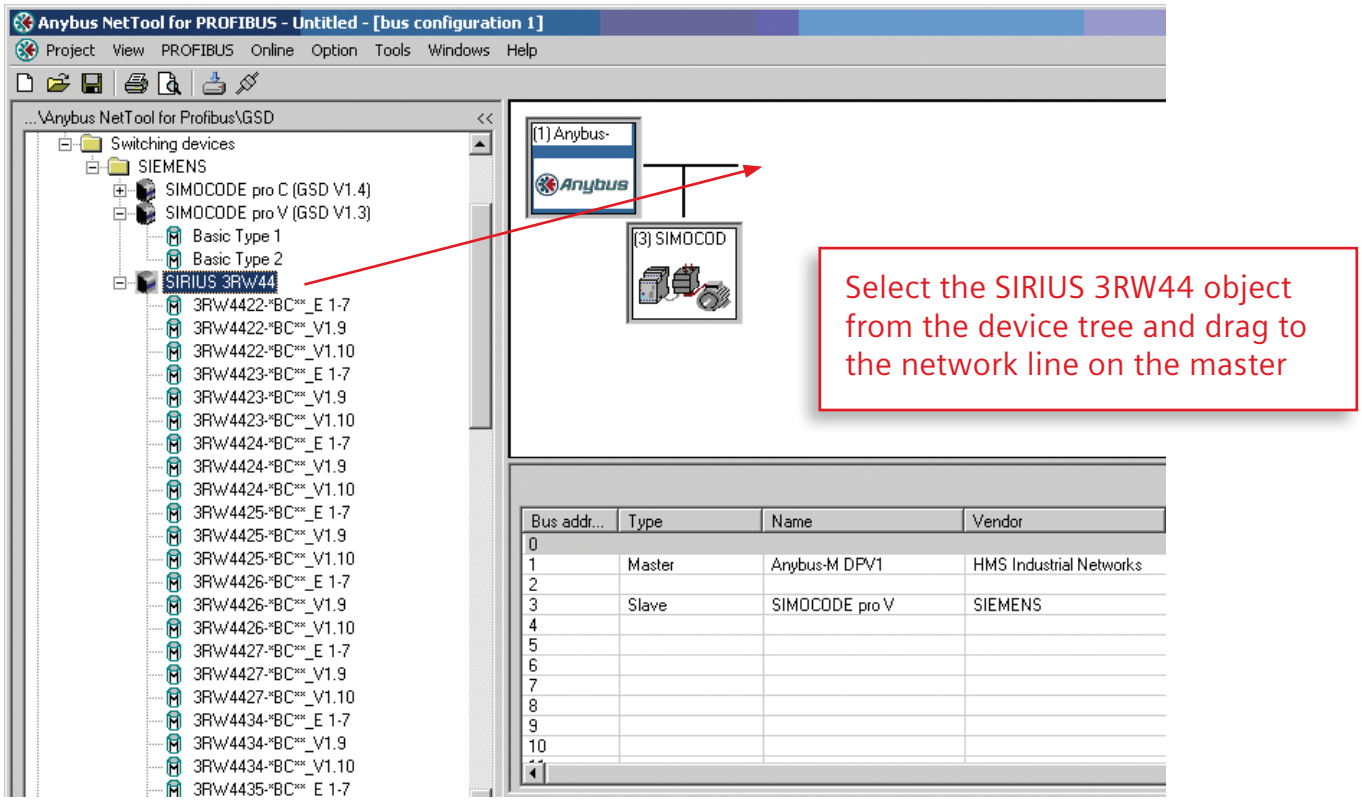
Important Note:
Always choose the <Basic Type 1> version of the unit for Pro V. Only <Basic Type 2> is available for Pro C.

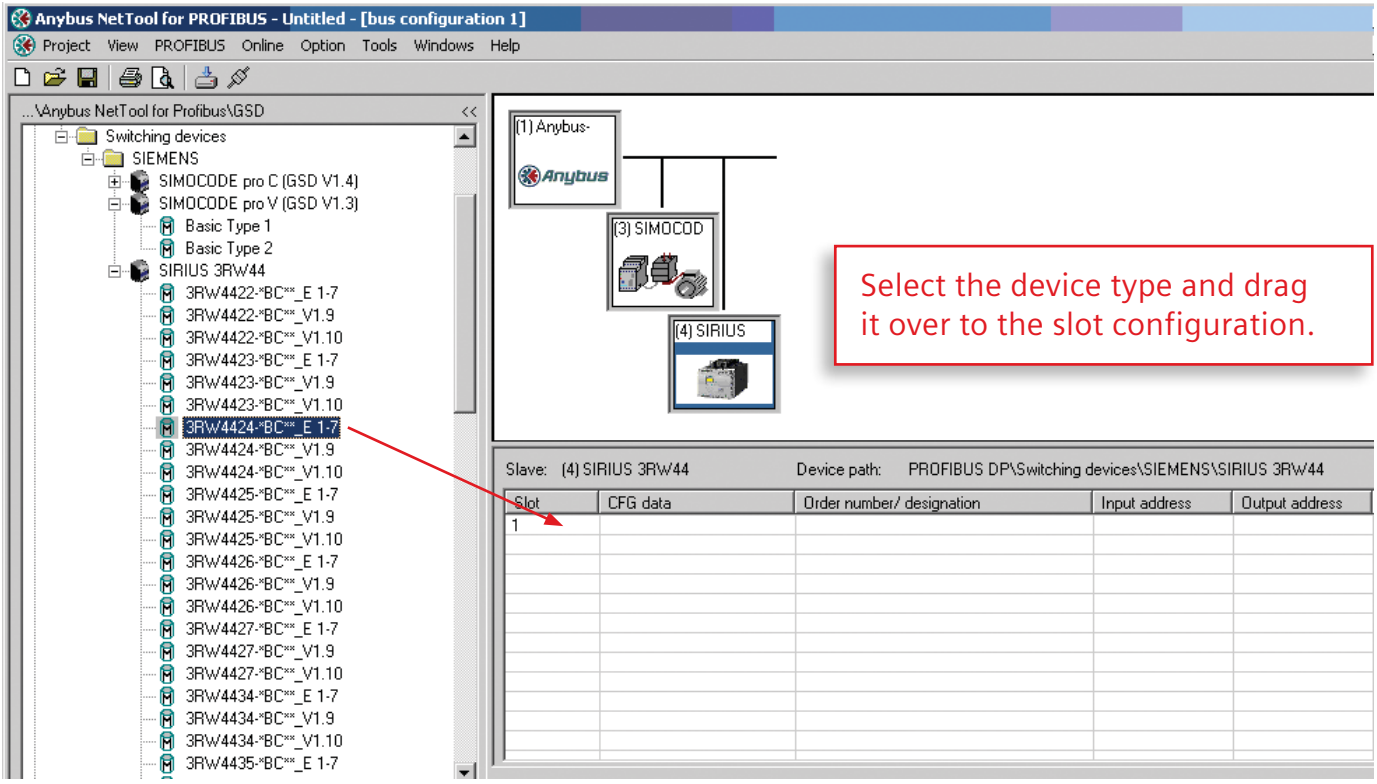




2.5. Step 5: Add an RVSS to the hardware configuration

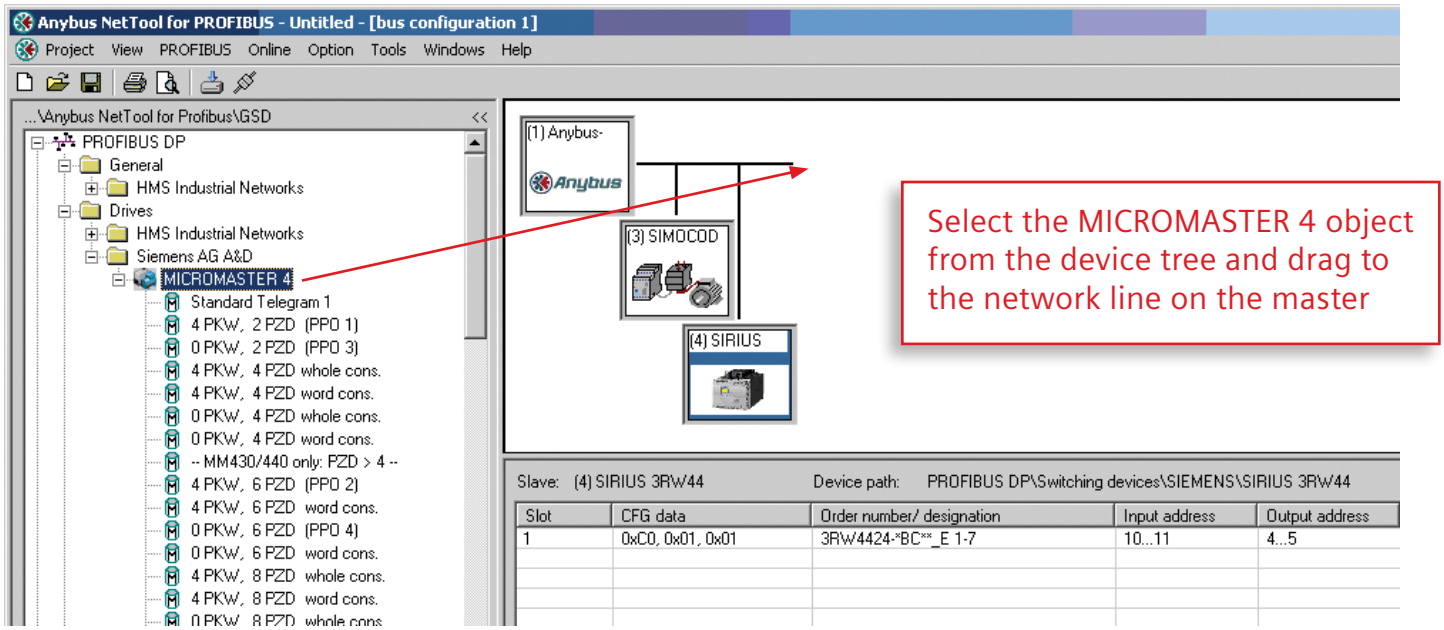
Important Note:
Please review the section on adding a SIMOCODE to the hardware configuration prior to reading this section.
The SIMOCODE shows additional steps that are deliberately not shown here for brevity.



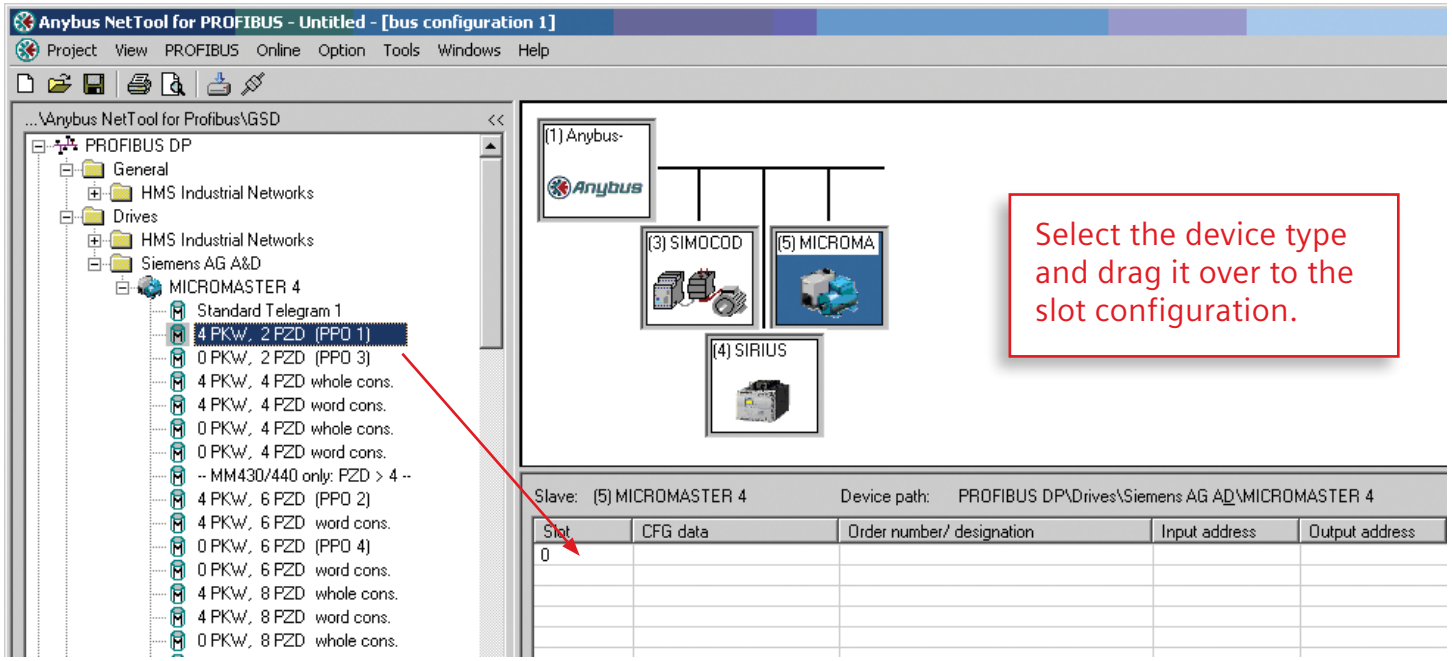


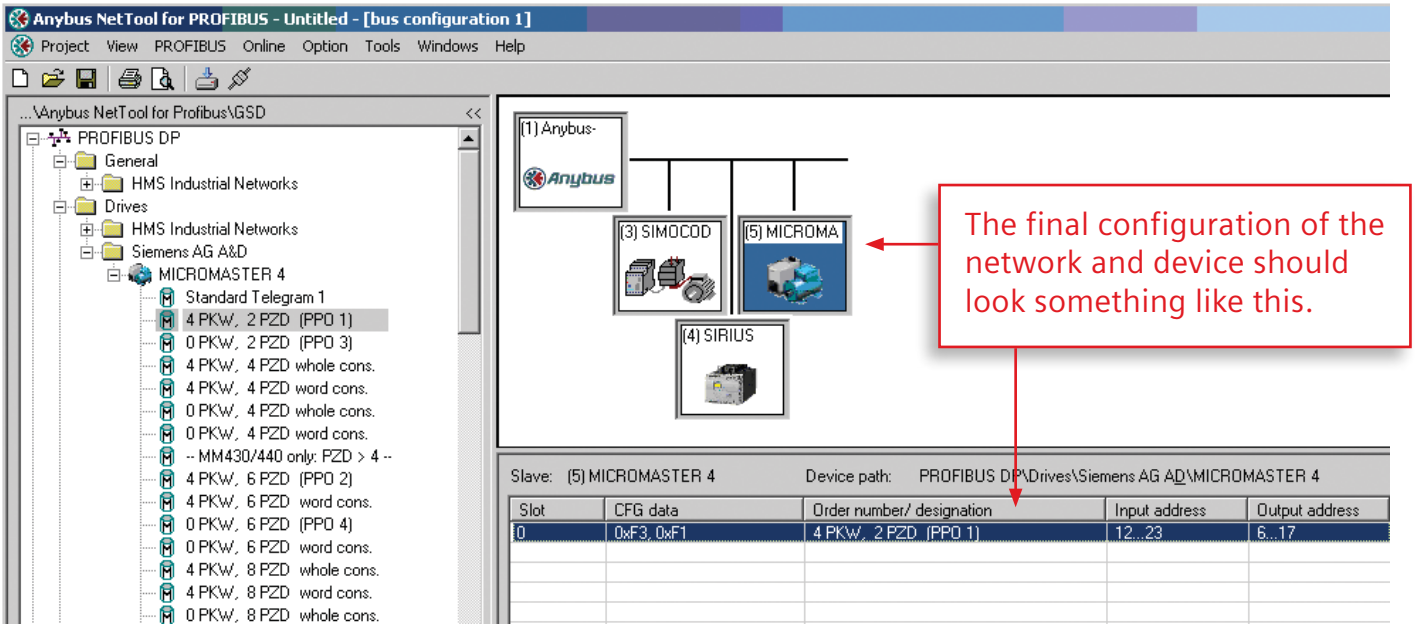
2.6. Step 6: Add an MM440 to the hardware configuration

Important Note:
Please review the section on adding a SIMOCODE to the hardware configuration prior to reading this section.
The SIMOCODE shows additional steps that are deliberately not shown here for brevity.



Important Note:
Always choose the <(PPO 1)> version of the unit.





2.7. Step 7: Save file

After all the nodes have been added to the network configuration, you must save the file.

3. Configure Gateway

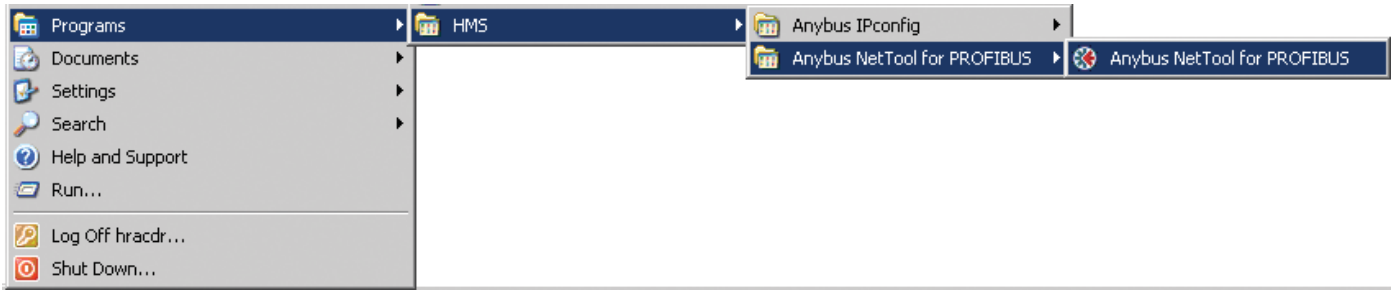
3.1. Step 1: Configure the Network Nodes

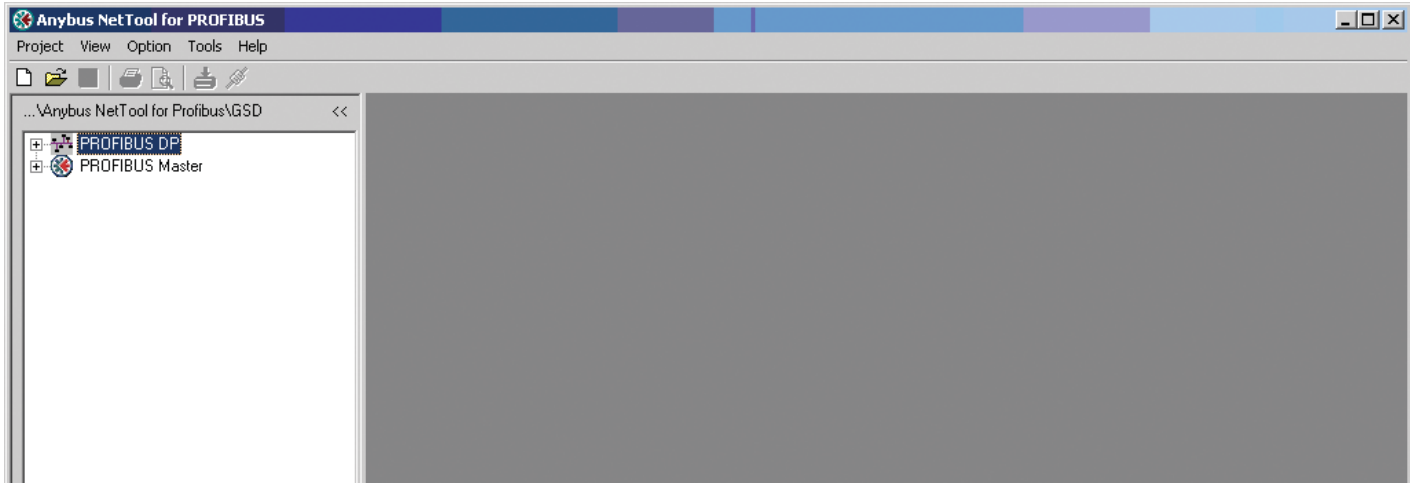
You must complete the following steps prior to configuring and testing the gateway.

- Download unit configuration files to each smart device that does not allow configuration via keypad.
- Enter node addressing to each smart device via keypad that does not receive downloaded unit configuration files from above

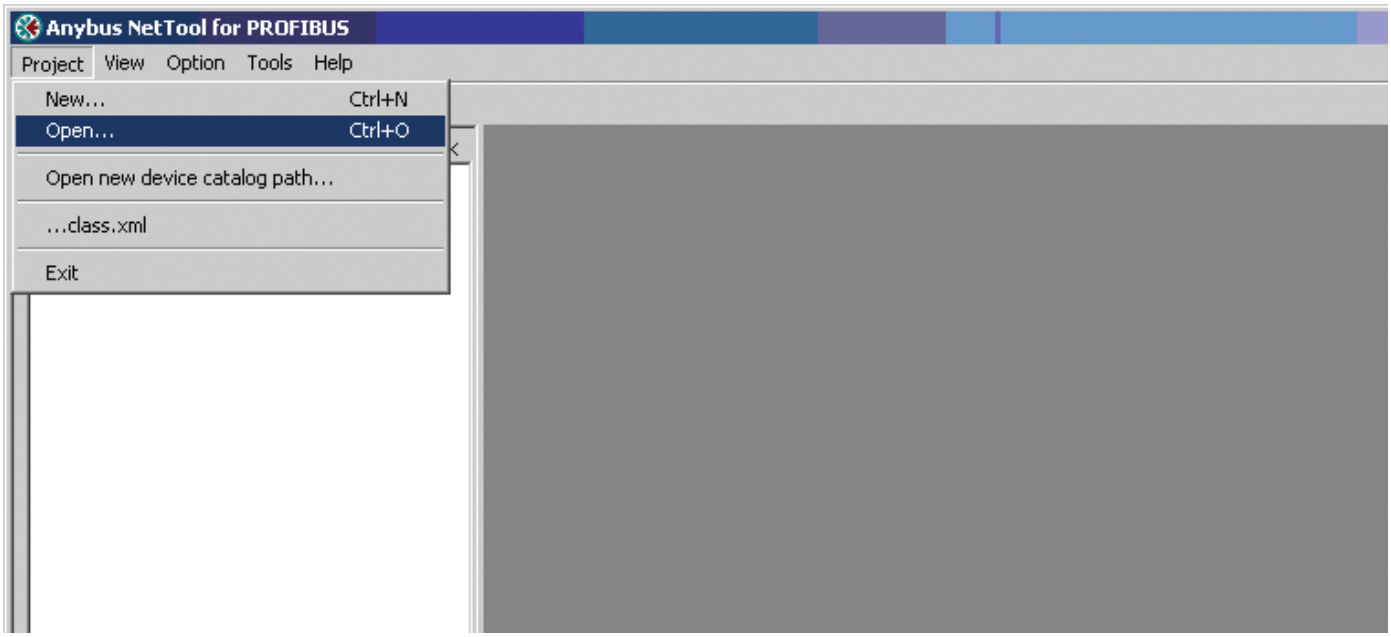
3.2. Step 2: Launch Gateway Configuration Software

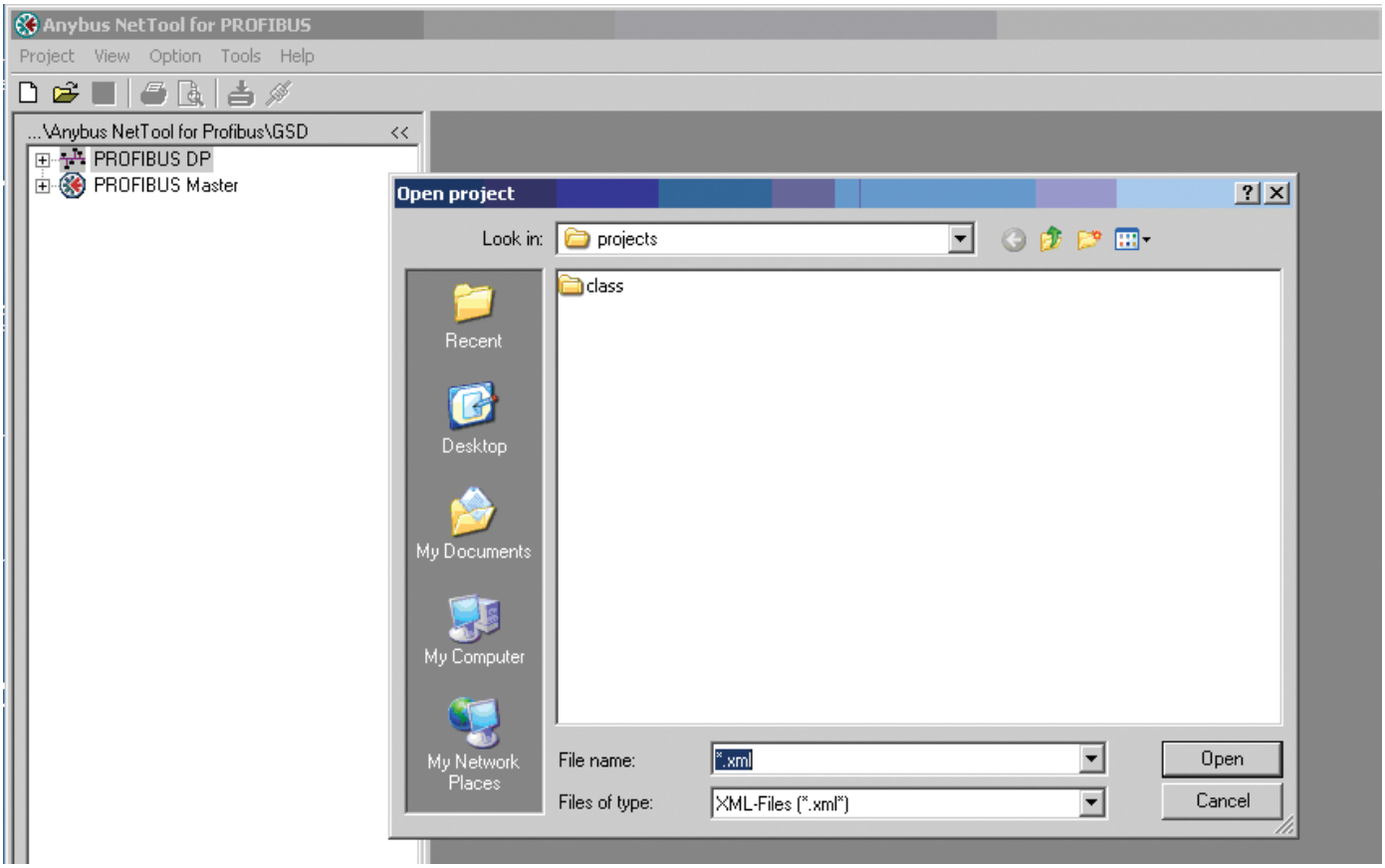
The Program we will be using is:



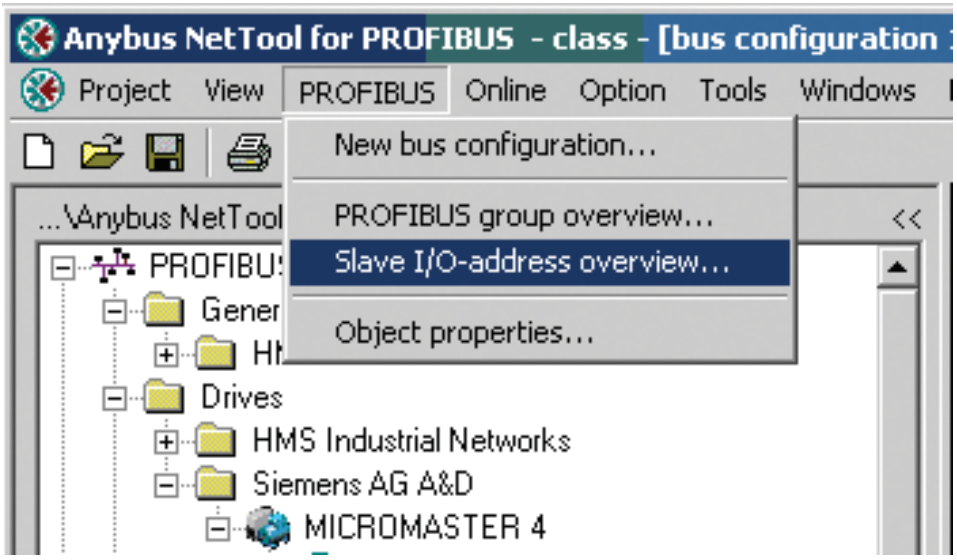


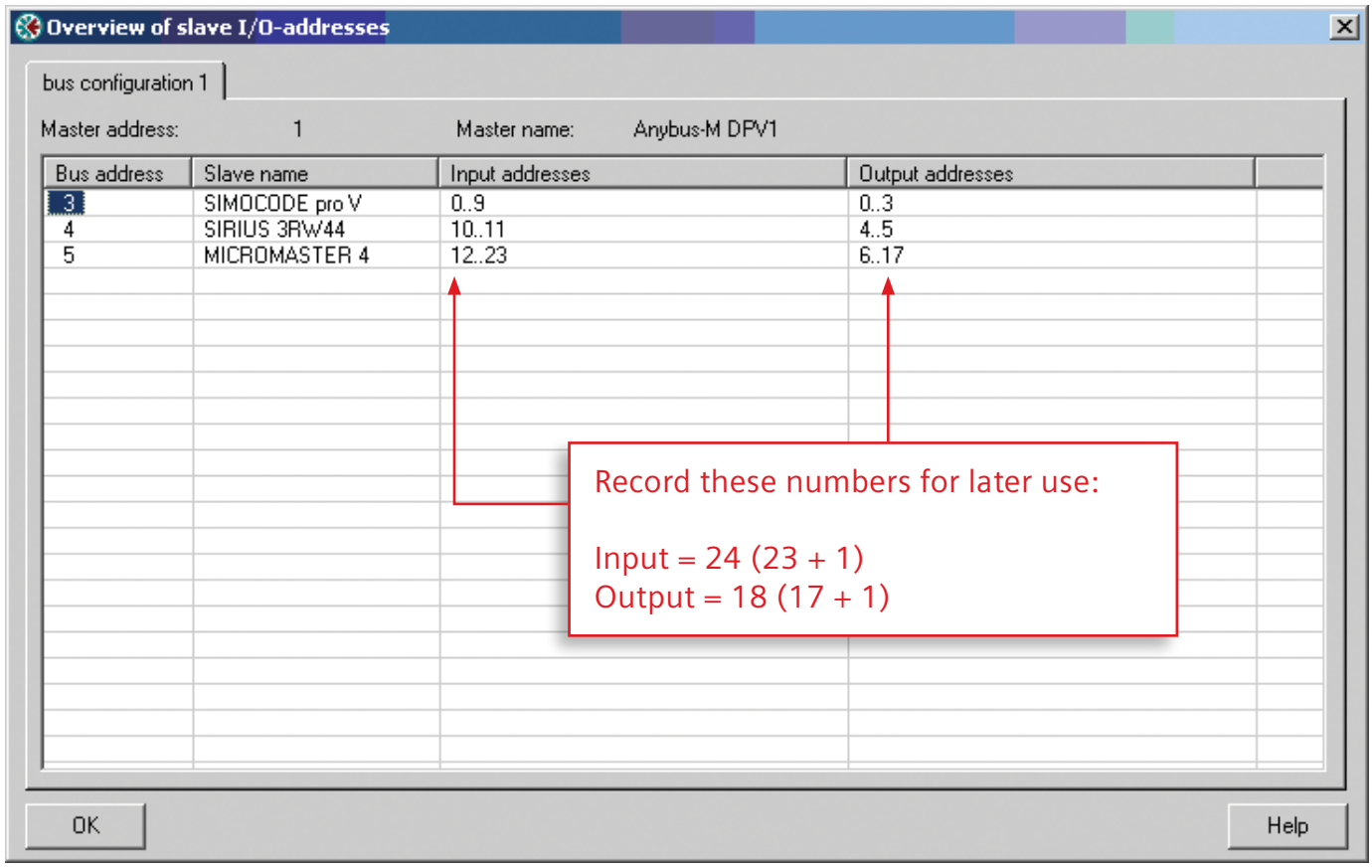
Open the .xml gateway configuration file.





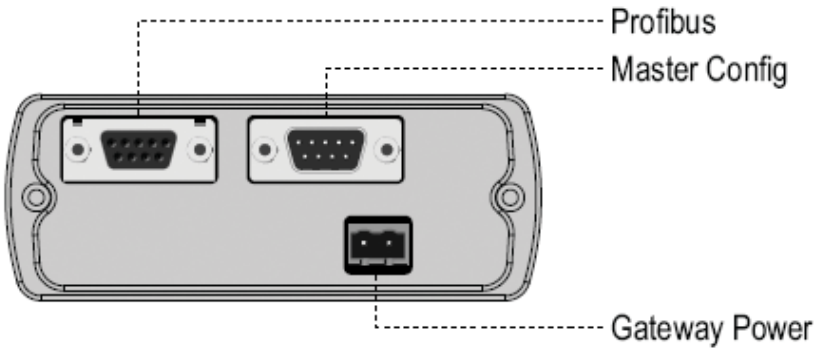
3.3. Step 3: Review the Network Addressing



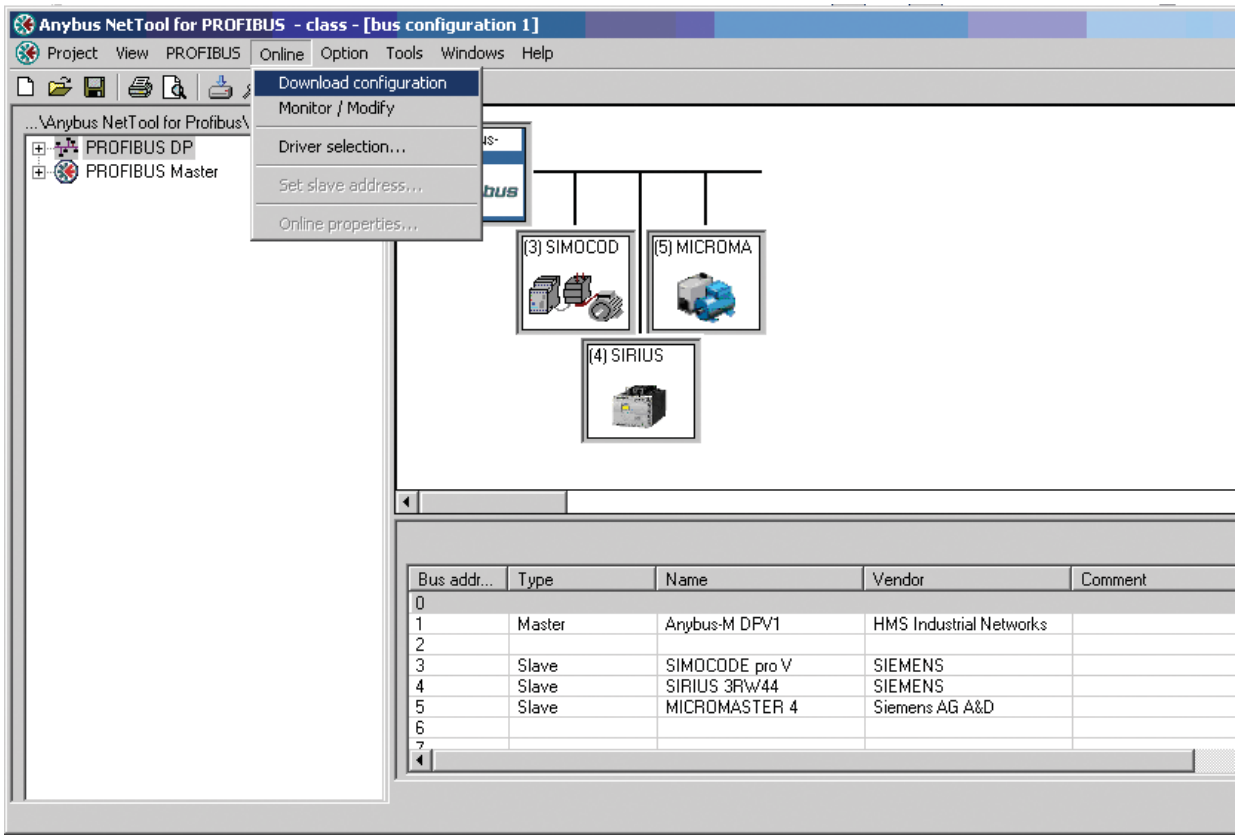


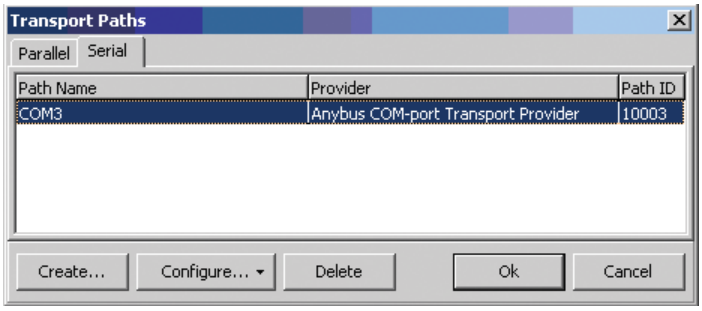
3.4. Step 4: Connect to the Profibus Configuration Port

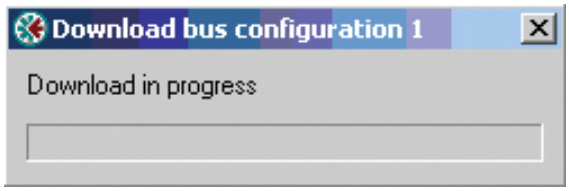
On the Profibus Master side of the Anybus X Gateway connect your RS-232 DB9FF Null Modem Cable to the Master Config Port and the serial port on your computer.

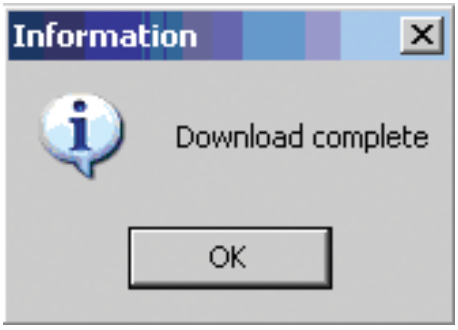


3.5. Step 5: Download the Profibus Configuration





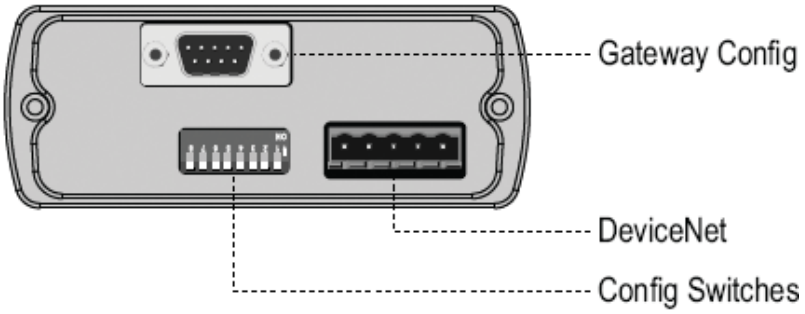




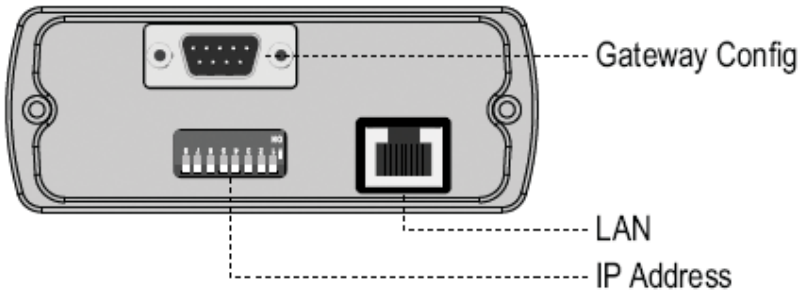
3.6. Step 6: Connect to Gateway Configuration Port

This is NOT the same port used to download the Master Configuration in Step 3.4.

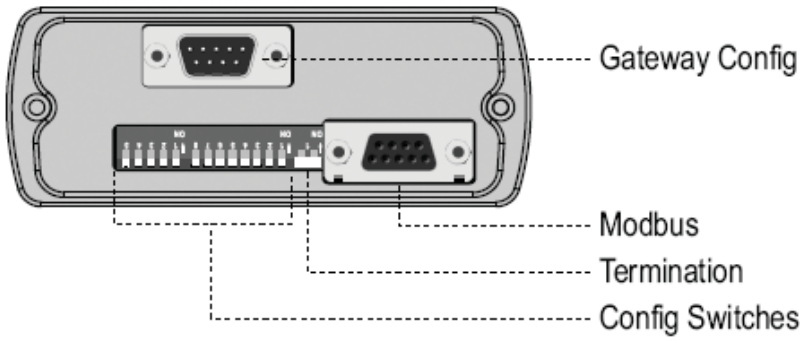
1. On the DeviceNet side of the Anybus X Gateway connect your RS-232 DB9FF Null Modem Cable to the Gateway Config Port and the serial port on your computer.



2. On the EtherNet/IP or Modbus TCP/IP side of the Anybus X Gateway connect your RS-232 DB9FF Null Modem Cable to the Gateway Config Port and the serial port on your computer.

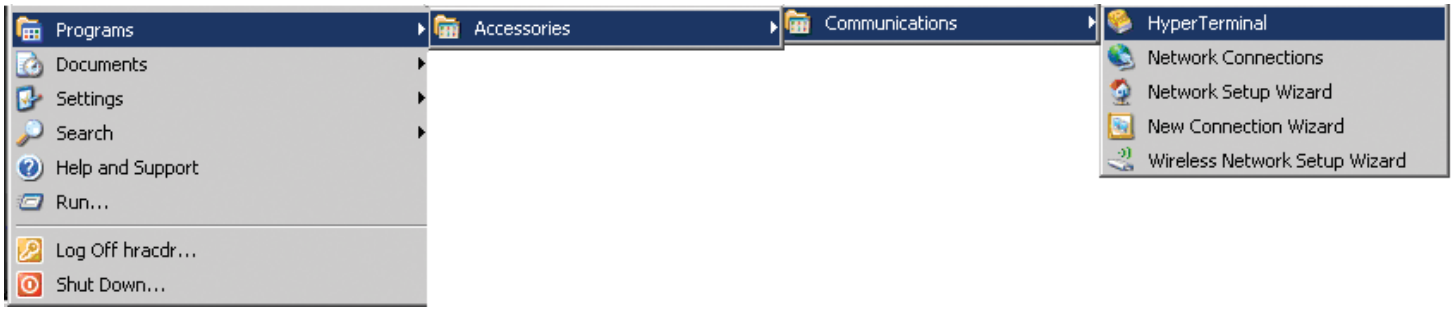


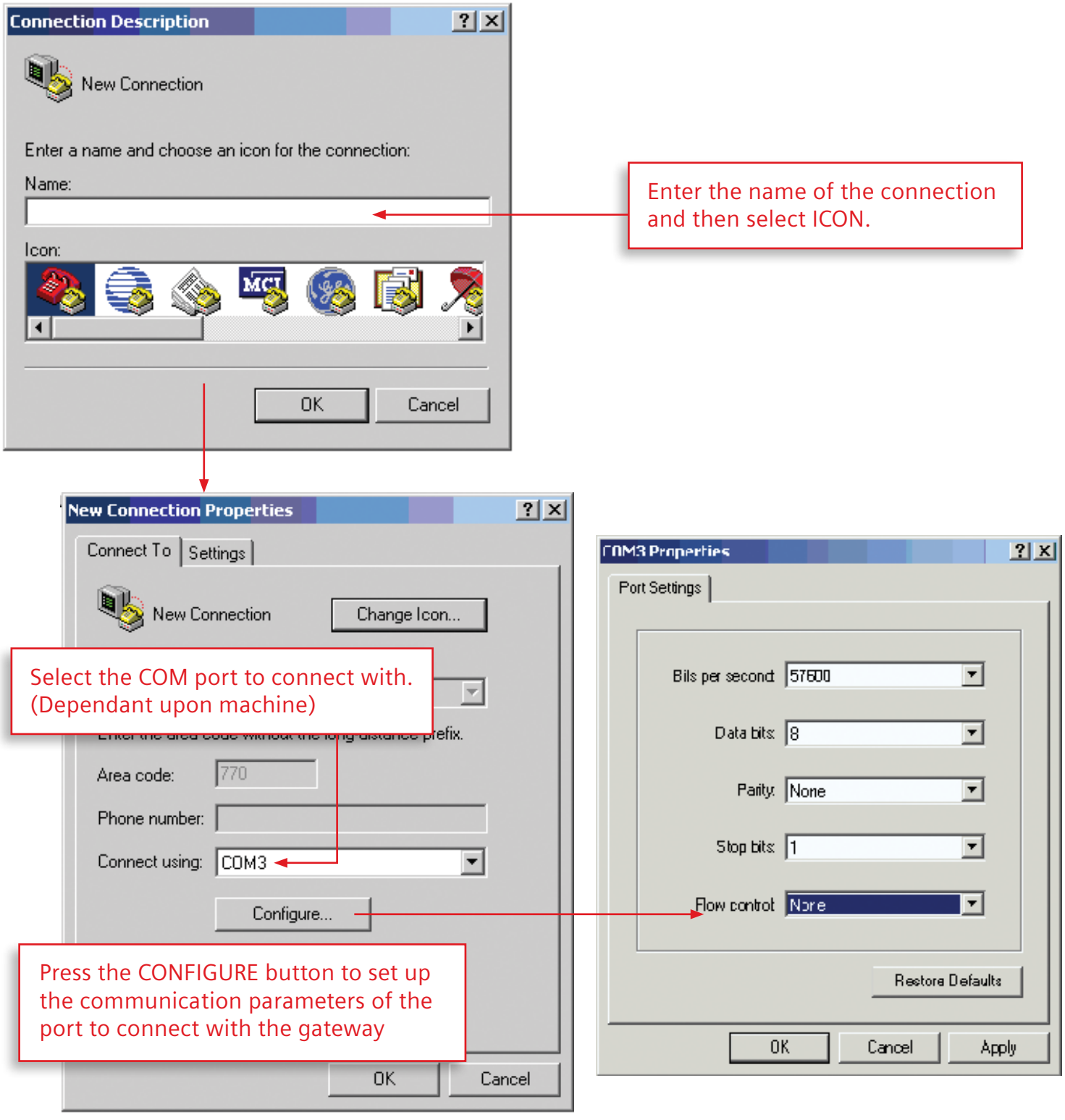
3. On the Modbus RTU side of the Anybus X Gateway connect your RS-232 DB9FF Null Modem Cable to the Gateway Config Port and the serial port on your computer.



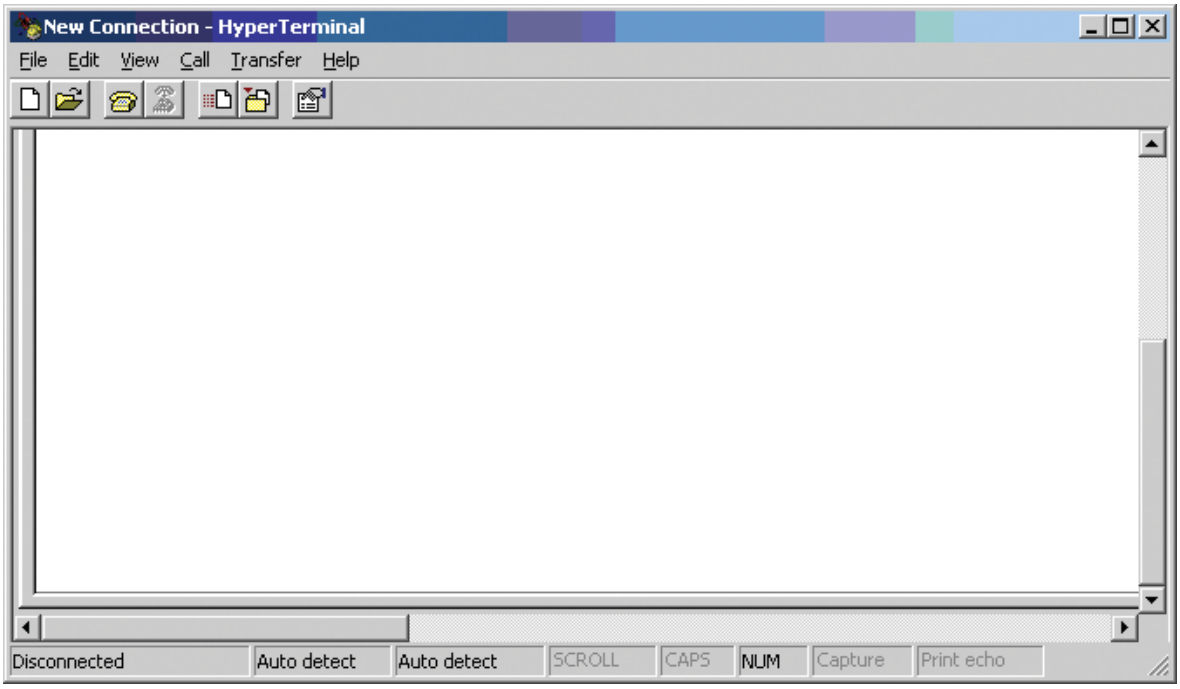
3.7. Step 7: Launch HyperTerminal

The Program we will be using is:

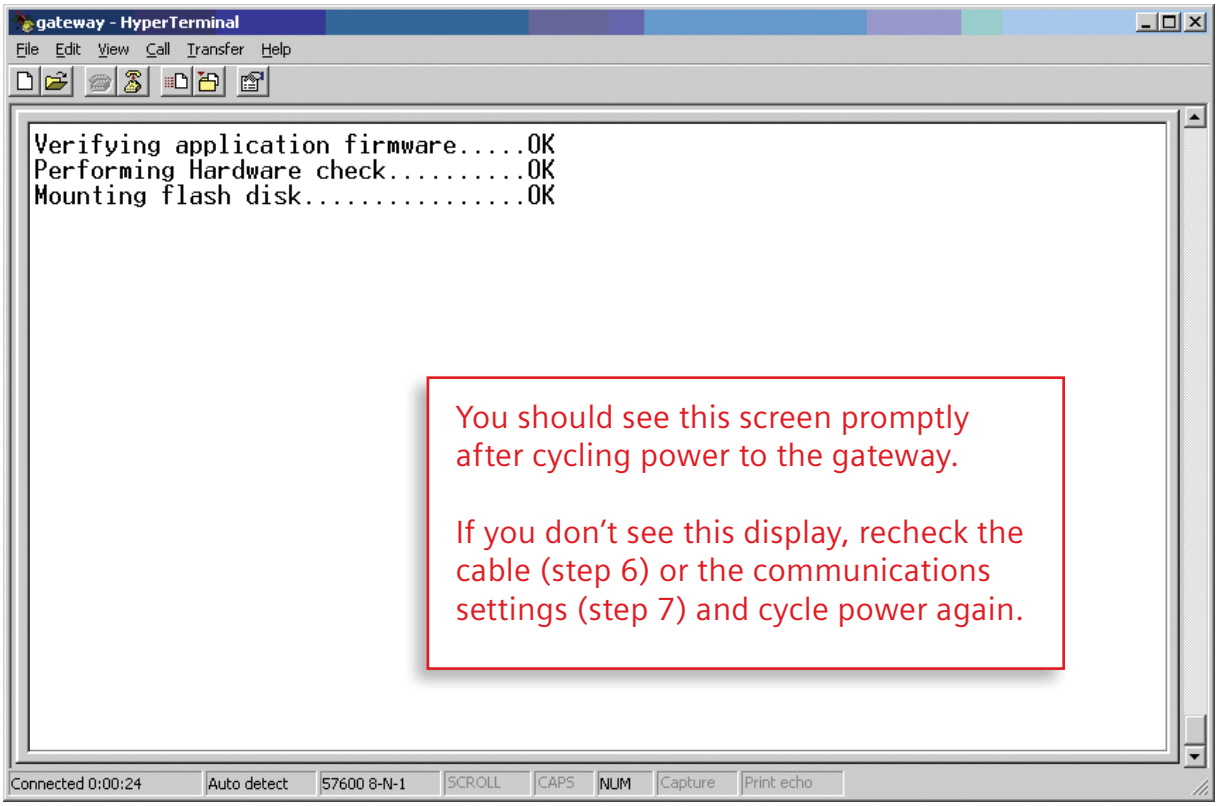




When the Hyper Terminal setup is complete this blank screen should appear.



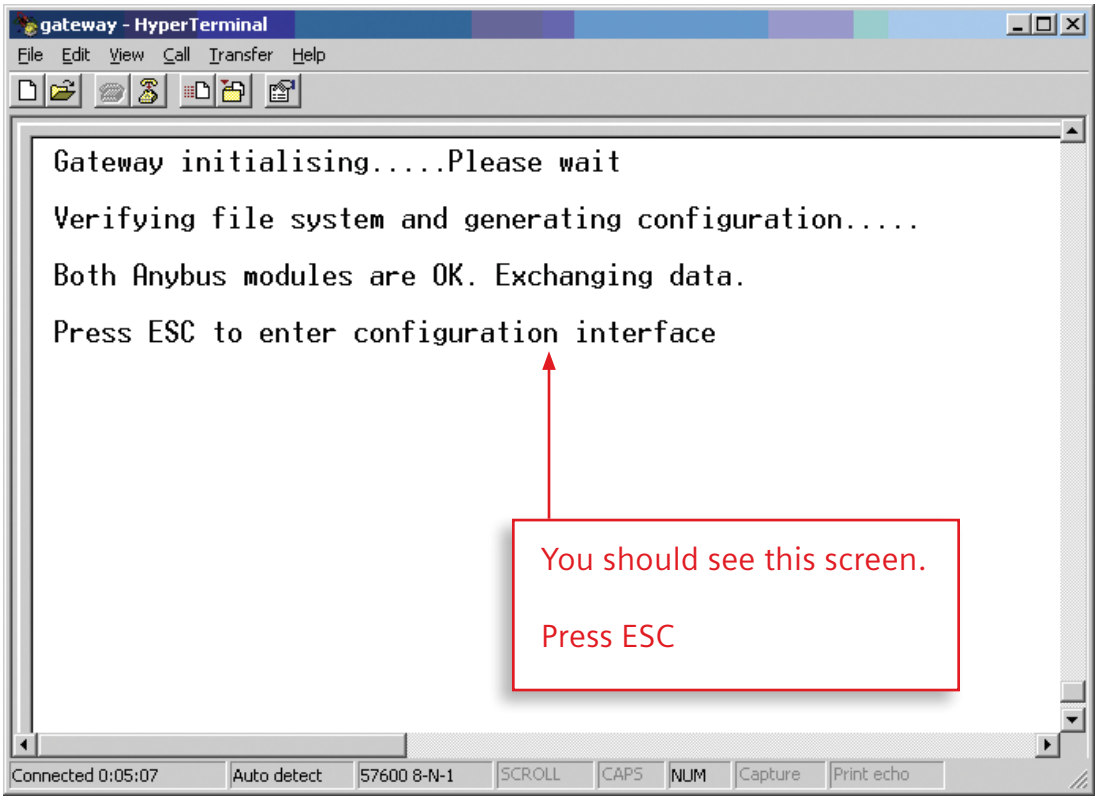
3.8. Step 8: Cycle Power to the Gateway



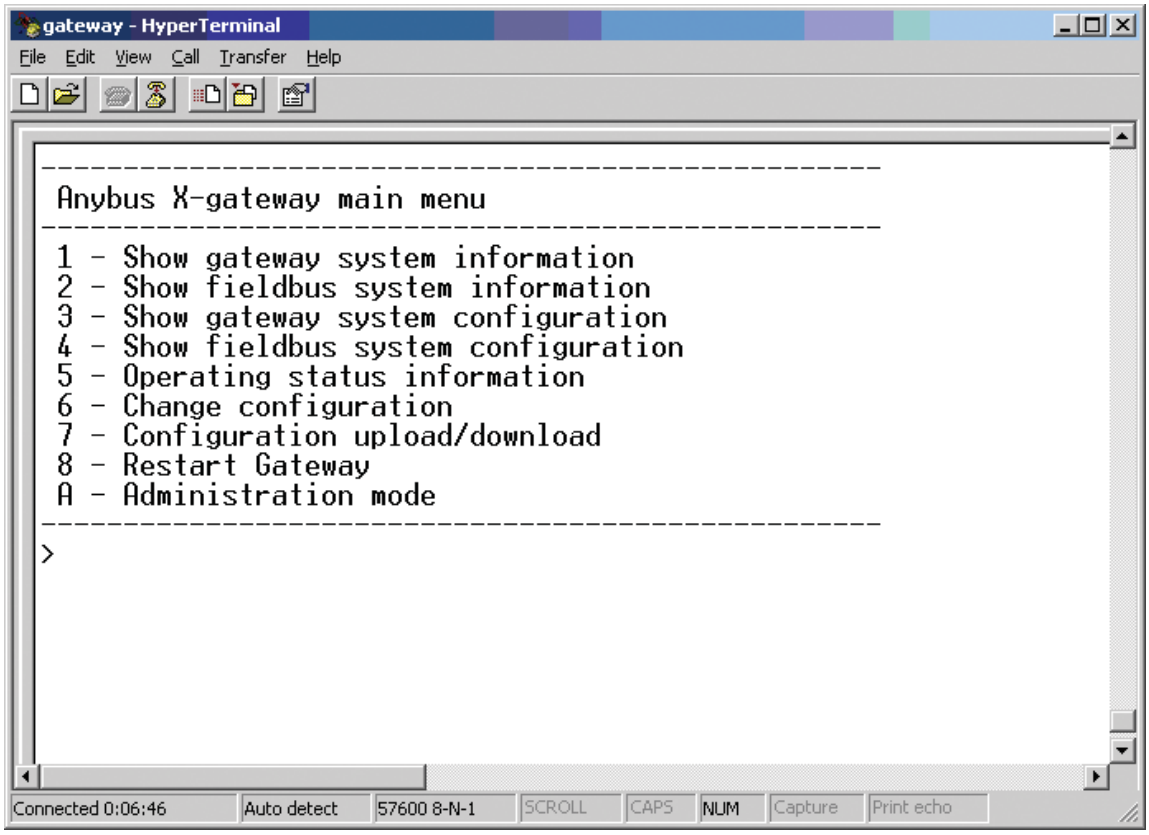
You should see this screen promptly after cycling power to the gateway.

If you don't see this display, recheck the cable (step 6) or the communications settings (step 7) and cycle power again.

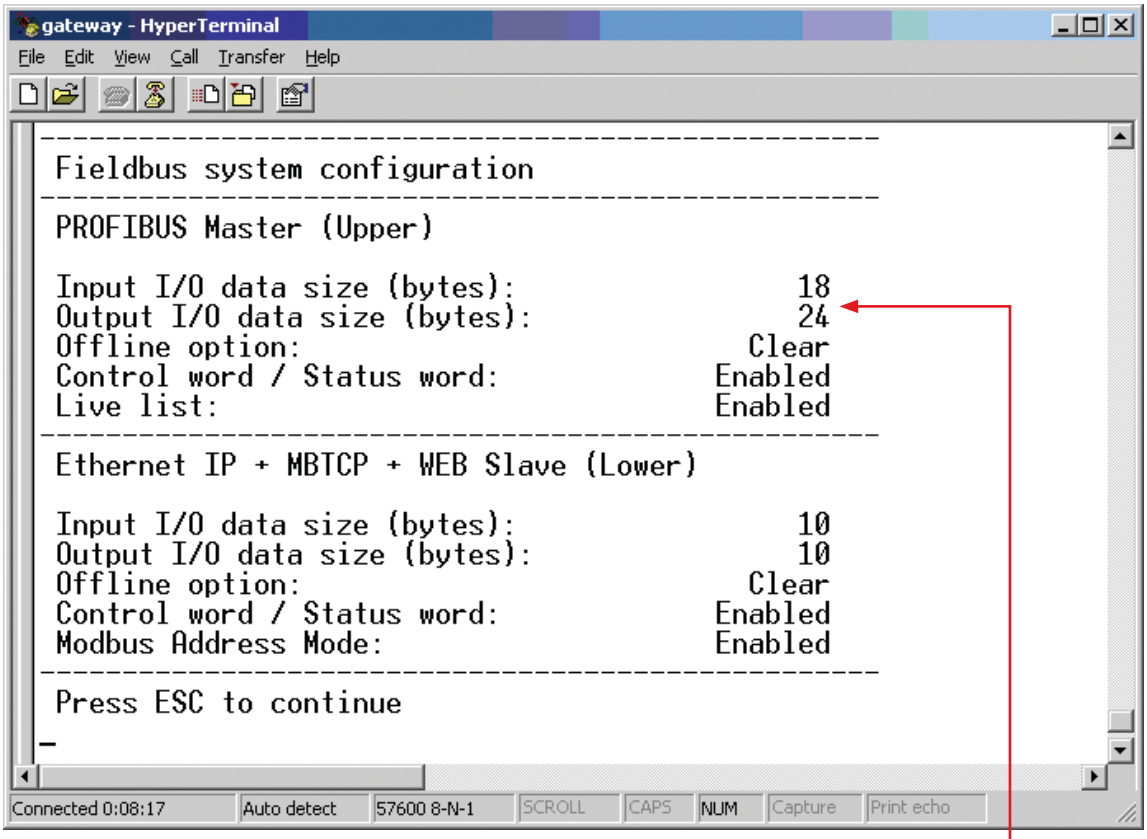
3.9. Step 9: Configure the Gateway



3.9.1. Choose Option 4 : Show fieldbus system configuration



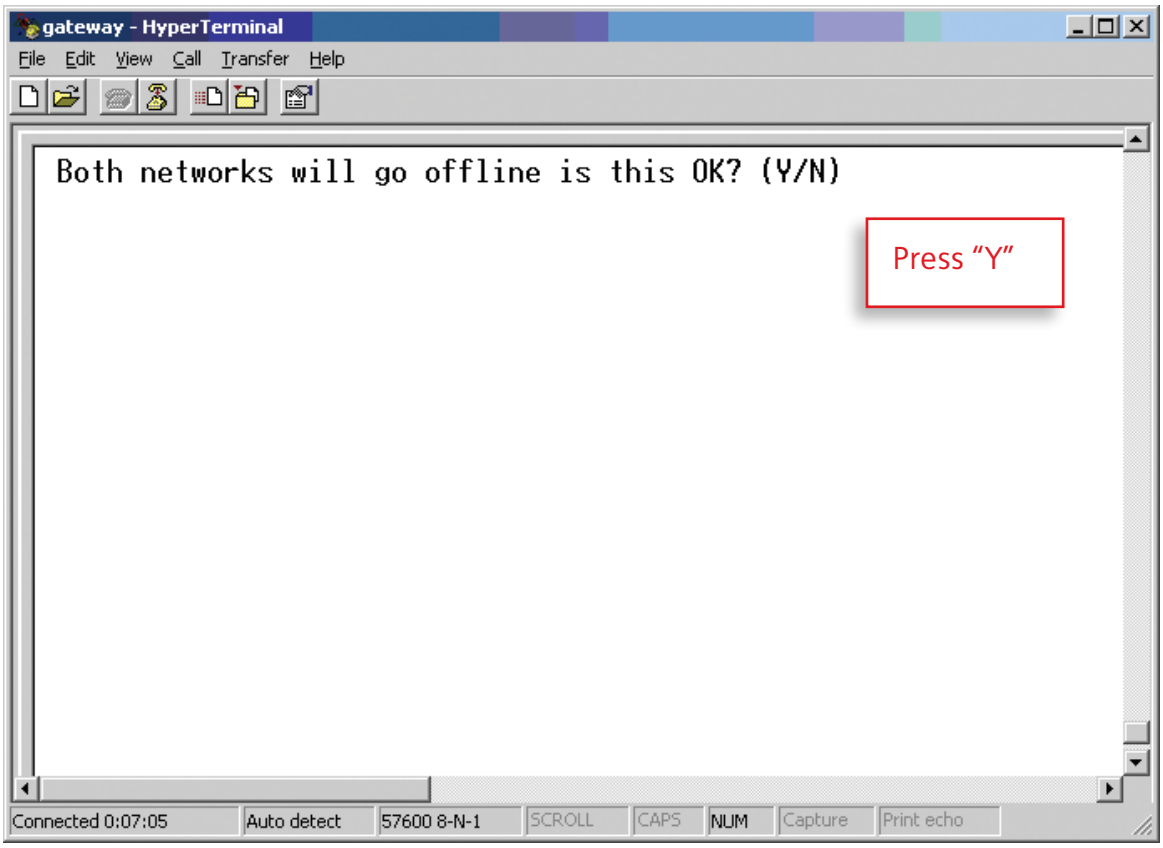
3.9.2. Choose Option 6 : Change configuration

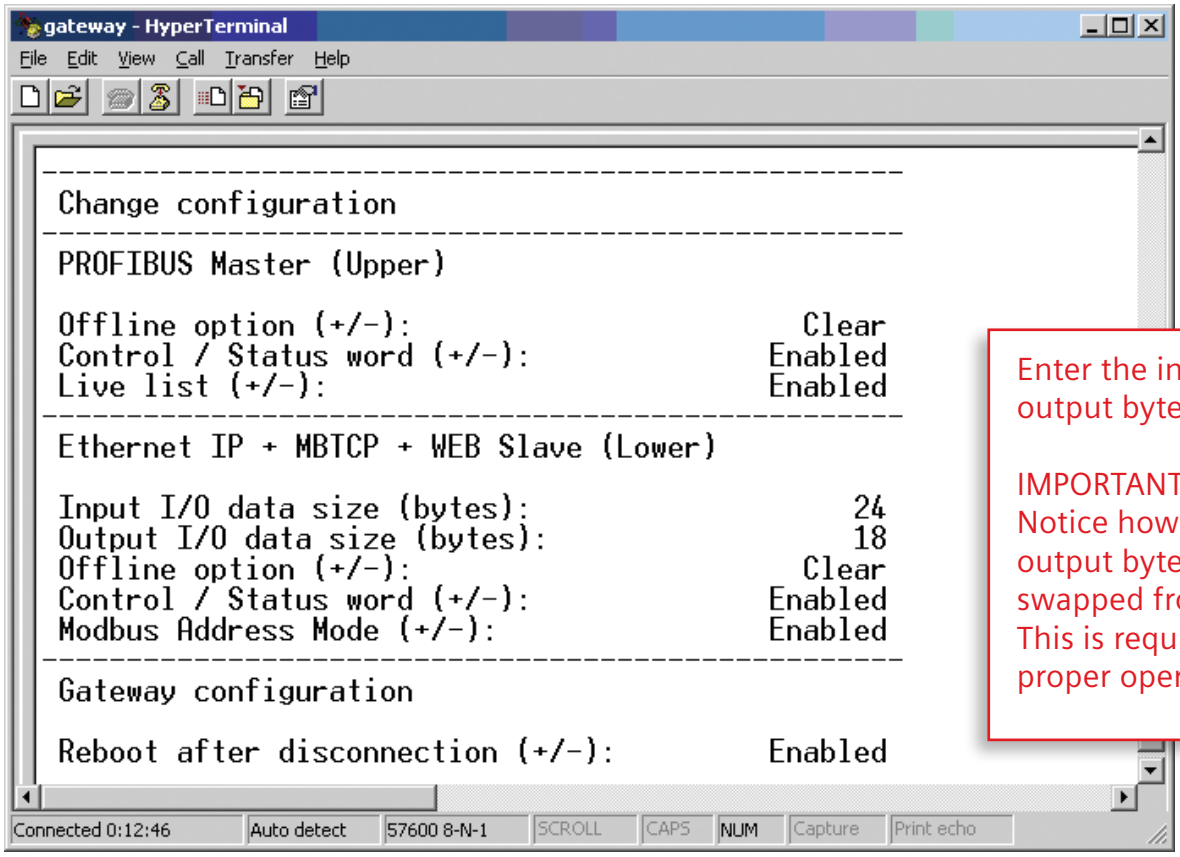


This is from the downloaded profibus configuration

Refer to step 3 and verify the numbers match

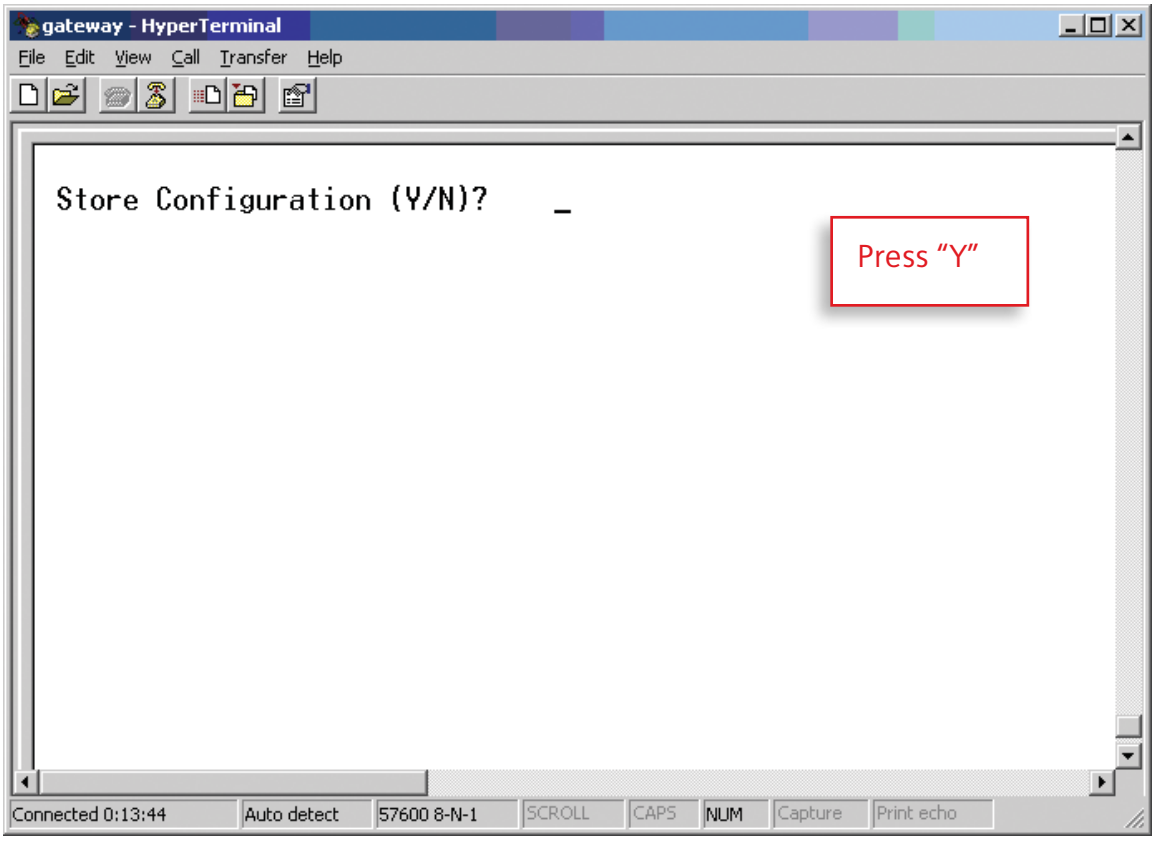
Press ESC to continue.

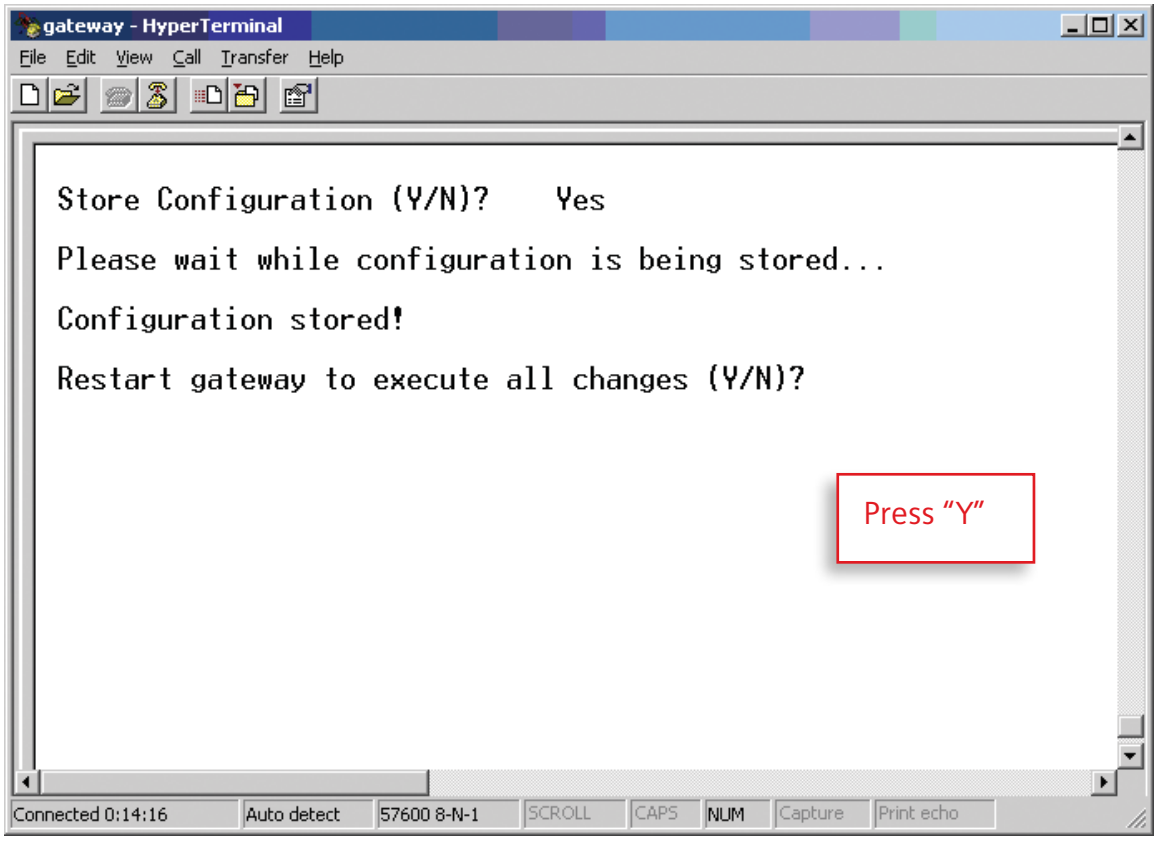




Enter the input and output byte sizes

IMPORTANT:
Notice how the input & output byte sizes are swapped from option 4. This is required for proper operation.



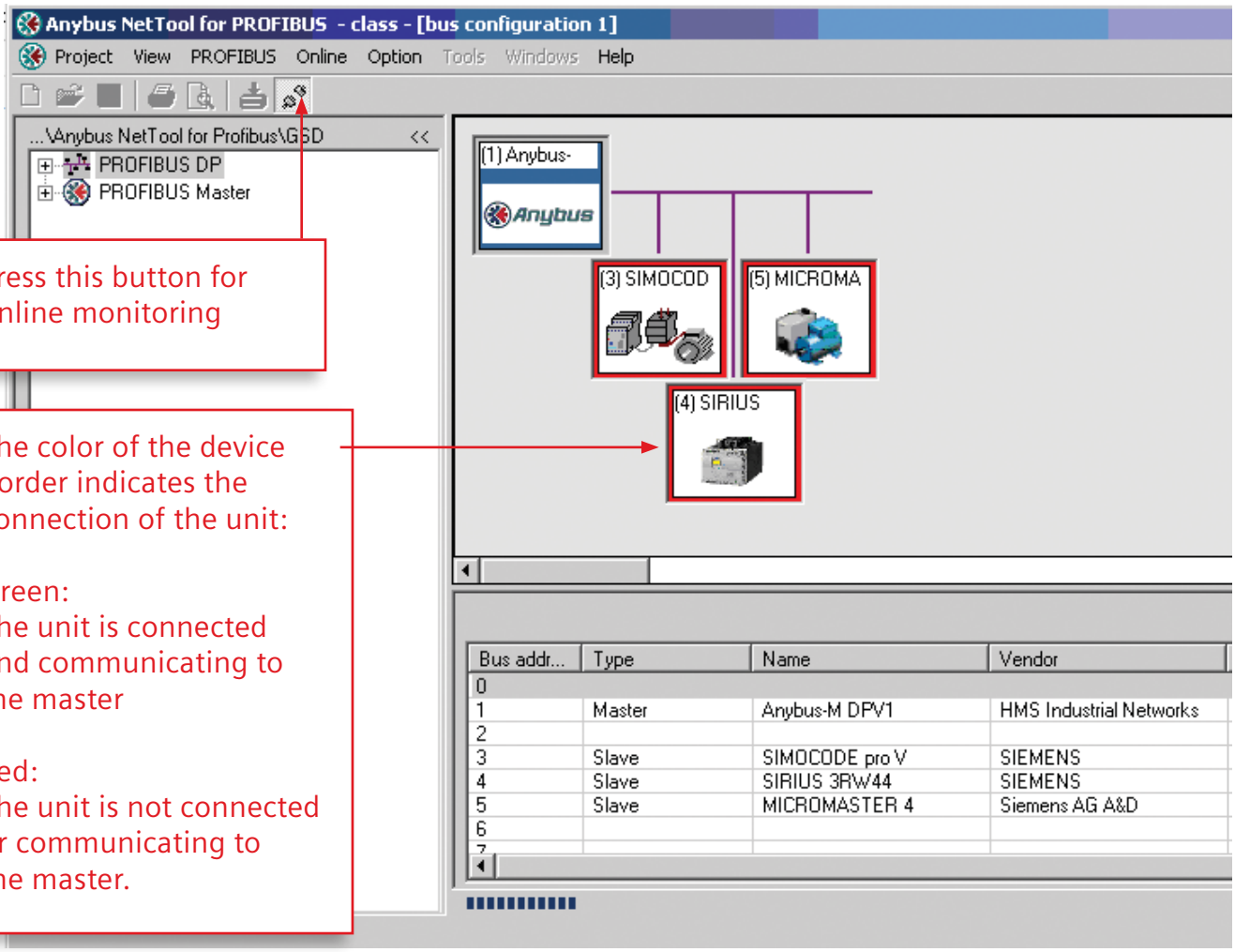


3.10. Step 10: Testing the Gateway Configuration

Before this step:
1. Exit Hyper Terminal.

2. Disconnect the serial cable connection from the gateway configuration port. (Refer to step 6)

3. Connect the serial cable to profibus configuration port. (Refer to step 4)



4. MODBUS Mapping

Modbus Holding Register	Profibus Input Byte	Profibus Input Byte	Modbus Holding Register	Profibus Output Byte	Profibus Output Byte
400001	0	1	401025	0	1
400002	2	3	401026	2	3
400003	4	5	401027	4	5
400004	6	7	401028	6	7
400005	8	9	401029	8	9
400006	10	11	401030	10	11
400007	12	13	401031	12	13
400008	14	15	401032	14	15
400009	16	17	401033	16	17
400010	18	19	401034	18	19
400011	20	21	401035	20	21
400012	22	23	401036	22	23
400013	24	25	401037	24	25
400014	26	27	401038	26	27
400015	28	29	401039	28	29
400016	30	31	401040	30	31
400017	32	33	401041	32	33
400018	34	35	401042	34	35
400019	36	37	401043	36	37
400020	38	39	401044	38	39
400021	40	41	401045	40	41
400022	42	43	401046	42	43
400023	44	45	401047	44	45
400024	46	47	401048	46	47
400025	48	49	401049	48	49
400026	50	51	401050	50	51
400027	52	53	401051	52	53
400028	54	55	401052	54	55
400029	56	57	401053	56	57
400030	58	59	401054	58	59
400031	60	61	401055	60	61
400032	62	63	401056	62	63
400033	64	65	401057	64	65
400034	66	67	401058	66	67
400035	68	69	401059	68	69
400036	70	71	401060	70	71
400037	72	73	401061	72	73

Modbus Holding Register	Profibus Input Byte	Profibus Input Byte	Modbus Holding Register	Profibus Output Byte	Profibus Output Byte
400038	74	75	401062	74	75
400039	76	77	401063	76	77
400040	78	79	401064	78	79
400041	80	81	401065	80	81
400042	82	83	401066	82	83
400043	84	85	401067	84	85
400044	86	87	401068	86	87
400045	88	89	401069	88	89
400046	90	91	401070	90	91
400047	92	93	401071	92	93
400048	94	95	401072	94	95
400049	96	97	401073	96	97
400050	98	99	401074	98	99
400051	100	101	401075	100	101
400052	102	103	401076	102	103
400053	104	105	401077	104	105
400054	106	107	401078	106	107
400055	108	109	401079	108	109
400056	110	111	401080	110	111
400057	112	113	401081	112	113
400058	114	115	401082	114	115
400059	116	117	401083	116	117
400060	118	119	401084	118	119
400061	120	121	401085	120	121
400062	122	123	401086	122	123
400063	124	125	401087	124	125
400064	126	127	401088	126	127
400065	128	129	401089	128	129
400066	130	131	401090	130	131
400067	132	133	401091	132	133
400068	134	135	401092	134	135
400069	136	137	401093	136	137
400070	138	139	401094	138	139
400071	140	141	401095	140	141
400072	142	143	401096	142	143
400073	144	145	401097	144	145
400074	146	147	401098	146	147
400075	148	149	401099	148	149
400076	150	151	401100	150	151
400077	152	153	401101	152	153
400078	154	155	401102	154	155
400079	156	157	401103	156	157
400080	158	159	401104	158	159
400081	160	161	401105	160	161

Modbus Holding Register	Profibus Input Byte	Profibus Input Byte	Modbus Holding Register	Profibus Output Byte	Profibus Output Byte
400082	162	163	401106	162	163
400083	164	165	401107	164	165
400084	166	167	401108	166	167
400085	168	169	401109	168	169
400086	170	171	401110	170	171
400087	172	173	401111	172	173
400088	174	175	401112	174	175
400089	176	177	401113	176	177
400090	178	179	401114	178	179
400091	180	181	401115	180	181
400092	182	183	401116	182	183
400093	184	185	401117	184	185
400094	186	187	401118	186	187
400095	188	189	401119	188	189
400096	190	191	401120	190	191
400097	192	193	401121	192	193
400098	194	195	401122	194	195
400099	196	197	401123	196	197
400100	198	199	401124	198	199
400101	200	201	401125	200	201
400102	202	203	401126	202	203
400103	204	205	401127	204	205
400104	206	207	401128	206	207
400105	208	209	401129	208	209
400106	210	211	401130	210	211
400107	212	213	401131	212	213
400108	214	215	401132	214	215
400109	216	217	401133	216	217
400110	218	219	401134	218	219
400111	220	221	401135	220	221
400112	222	223	401136	222	223
400113	224	225	401137	224	225
400114	226	227	401138	226	227
400115	228	229	401139	228	229
400116	230	231	401140	230	231
400117	232	233	401141	232	233
400118	234	235	401142	234	235
400119	236	237	401143	236	237
400120	238	239	401144	238	239
400121	240	241	401145	240	241
400122	242	243	401146	242	243
400123	244	245	401147	244	245
400124	246	247	401148	246	247
400125	248	249	401149	248	249

Modbus Holding Register	Profibus Input Byte	Profibus Input Byte	Modbus Holding Register	Profibus Output Byte	Profibus Output Byte
400126	250	251	401150	250	251
400127	252	253	401151	252	253
400128	254	255	401152	254	255
400129	256	257	401153	256	257
400130	258	259	401154	258	259
400131	260	261	401155	260	261
400132	262	263	401156	262	263
400133	264	265	401157	264	265
400134	266	267	401158	266	267
400135	268	269	401159	268	269
400136	270	271	401160	270	271
400137	272	273	401161	272	273
400138	274	275	401162	274	275
400139	276	277	401163	276	277
400140	278	279	401164	278	279
400141	280	281	401165	280	281
400142	282	283	401166	282	283
400143	284	285	401167	284	285
400144	286	287	401168	286	287
400145	288	289	401169	288	289
400146	290	291	401170	290	291
400147	292	293	401171	292	293
400148	294	295	401172	294	295
400149	296	297	401173	296	297
400150	298	299	401174	298	299
400151	300	301	401175	300	301
400152	302	303	401176	302	303
400153	304	305	401177	304	305
400154	306	307	401178	306	307
400155	308	309	401179	308	309
400156	310	311	401180	310	311
400157	312	313	401181	312	313
400158	314	315	401182	314	315
400159	316	317	401183	316	317
400160	318	319	401184	318	319
400161	320	321	401185	320	321
400162	322	323	401186	322	323
400163	324	325	401187	324	325
400164	326	327	401188	326	327
400165	328	329	401189	328	329
400166	330	331	401190	330	331
400167	332	333	401191	332	333
400168	334	335	401192	334	335
400169	336	337	401193	336	337

Modbus Holding Register	Profibus Input Byte	Profibus Input Byte	Modbus Holding Register	Profibus Output Byte	Profibus Output Byte
400170	338	339	401194	338	339
400171	340	341	401195	340	341
400172	342	343	401196	342	343
400173	344	345	401197	344	345
400174	346	347	401198	346	347
400175	348	349	401199	348	349
400176	350	351	401200	350	351
400177	352	353	401201	352	353
400178	354	355	401202	354	355
400179	356	357	401203	356	357
400180	358	359	401204	358	359
400181	360	361	401205	360	361
400182	362	363	401206	362	363
400183	364	365	401207	364	365
400184	366	367	401208	366	367
400185	368	369	401209	368	369
400186	370	371	401210	370	371
400187	372	373	401211	372	373
400188	374	375	401212	374	375
400189	376	377	401213	376	377
400190	378	379	401214	378	379
400191	380	381	401215	380	381
400192	382	383	401216	382	383
400193	384	385	401217	384	385
400194	386	387	401218	386	387
400195	388	389	401219	388	389
400196	390	391	401220	390	391
400197	392	393	401221	392	393
400198	394	395	401222	394	395
400199	396	397	401223	396	397
400200	398	399	401224	398	399
400201	400	401	401225	400	401
400202	402	403	401226	402	403
400203	404	405	401227	404	405
400204	406	407	401228	406	407
400205	408	409	401229	408	409
400206	410	411	401230	410	411
400207	412	413	401231	412	413
400208	414	415	401232	414	415
400209	416	417	401233	416	417
400210	418	419	401234	418	419
400211	420	421	401235	420	421
400212	422	423	401236	422	423
400213	424	425	401237	424	425

Modbus Holding Register	Profibus Input Byte	Profibus Input Byte	Modbus Holding Register	Profibus Output Byte	Profibus Output Byte
400214	426	427	401238	426	427
400215	428	429	401239	428	429
400216	430	431	401240	430	431
400217	432	433	401241	432	433
400218	434	435	401242	434	435
400219	436	437	401243	436	437
400220	438	439	401244	438	439
400221	440	441	401245	440	441
400222	442	443	401246	442	443
400223	444	445	401247	444	445
400224	446	447	401248	446	447
400225	448	449	401249	448	449
400226	450	451	401250	450	451
400227	452	453	401251	452	453
400228	454	455	401252	454	455
400229	456	457	401253	456	457
400230	458	459	401254	458	459
400231	460	461	401255	460	461
400232	462	463	401256	462	463
400233	464	465	401257	464	465
400234	466	467	401258	466	467
400235	468	469	401259	468	469
400236	470	471	401260	470	471
400237	472	473	401261	472	473
400238	474	475	401262	474	475
400239	476	477	401263	476	477
400240	478	479	401264	478	479
400241	480	481	401265	480	481
400242	482	483	401266	482	483
400243	484	485	401267	484	485
400244	486	487	401268	486	487
400245	488	489	401269	488	489
400246	490	491	401270	490	491
400247	492	493	401271	492	493
400248	494	495	401272	494	495
400249	496	497	401273	496	497
400250	498	499	401274	498	499
400251	500	501	401275	500	501
400252	502	503	401276	502	503
400253	504	505	401277	504	505
400254	506	507	401278	506	507
400255	508	509	401279	508	509
400256	510	511	401280	510	511

5. Device Data

5.1. SIMOCODE

Byte.Bit	Designation	Presetting (also see parameters)	Type	Information
0.0	Cyclic Receive - Bit 0.0	Control Station - PLC/PCS [DP] ON <	Bit	
0.1	Cyclic Receive - Bit 0.1	Control Station - PLC/PCS [DP] OFF	Bit	
0.2	Cyclic Receive - Bit 0.2	Control Station - PLC/PCS [DP] ON >	Bit	
0.3	Cyclic Receive - Bit 0.3	Test 1	Bit	
0.4	Cyclic Receive - Bit 0.4	Motor Protection - Emergency Start	Bit	
0.5	Cyclic Receive - Bit 0.5	Operation Mode Selector S1	Bit	
0.6	Cyclic Receive - Bit 0.6	Reset 1	Bit	
0.7	Cyclic Receive - Bit 0.7	Not Assigned	Bit	BU1 BU2
1.0	Cyclic Receive - Bit 1.0	Not Assigned	Bit	
1.1	Cyclic Receive - Bit 1.1	Not Assigned	Bit	
1.2	Cyclic Receive - Bit 1.2	Not Assigned	Bit	
1.3	Cyclic Receive - Bit 1.3	Not Assigned	Bit	
1.4	Cyclic Receive - Bit 1.4	Not Assigned	Bit	
1.5	Cyclic Receive - Bit 1.5	Not Assigned	Bit	
1.6	Cyclic Receive - Bit 1.6	Not Assigned	Bit	
1.7	Cyclic Receive - Bit 1.7	Not Assigned	Bit	
2.0 to 3.7	Cyclic Receive - Analog Value	Not Assigned	Word	BU2

Table B-5: Data Record 67 - Process Image of the Outputs

Byte.Bit	Designation	Presetting (also see parameters)	Type	Information
0.0	Cyclic Send - Bit 0.0	Status - ON <	Bit	
0.1	Cyclic Send - Bit 0.1	Status - OFF	Bit	
0.2	Cyclic Send - Bit 0.2	Status - ON >	Bit	
0.3	Cyclic Send - Bit 0.3	Event - Overload Operation	Bit	
0.4	Cyclic Send - Bit 0.4	Status - Interlocking Time Active	Bit	
0.5	Cyclic Send - Bit 0.5	Status - Remote Mode	Bit	
0.6	Cyclic Send - Bit 0.6	Status - General Fault	Bit	
0.7	Cyclic Send - Bit 0.7	Status - General Warning	Bit	
1.0	Cyclic Send - Bit 1.0	Not Assigned	Bit	BU1 BU2
1.1	Cyclic Send - Bit 1.1	Not Assigned	Bit	
1.2	Cyclic Send - Bit 1.2	Not Assigned	Bit	
1.3	Cyclic Send - Bit 1.3	Not Assigned	Bit	
1.4	Cyclic Send - Bit 1.4	Not Assigned	Bit	
1.5	Cyclic Send - Bit 1.5	Not Assigned	Bit	
1.6	Cyclic Send - Bit 1.6	Not Assigned	Bit	
1.7	Cyclic Send - Bit 1.7	Not Assigned	Bit	
2.0	PLC/PCS Analog Input 1	Max. Current I_max	Word	
4.0	PLC/PCS Analog Input 2	Not Assigned	Word	BU2
6.0	PLC/PCS Analog Input 3	Not Assigned	Word	BU2
8.0	PLC/PCS Analog Input 4	Not Assigned	Word	BU2

Table B-6: Data Record 69 - Process Image of the Inputs

Note:
Table B-5 and B-6 display typical data. Information located in the Presetting column may vary dependant upon device configuration. See the Simocode Pro System Manual for more detail.

Byte	Meaning
	Preamble
0	Writing coordination 0x20 via channel C1 (PLC) Writing 0x30 via channel C2 (PC) Writing 0x40 via device interface (PC)
1 - 3	Reserved = 0
	Process image of the outputs
4	Process data DO-0.0 to DO-0.7, table below
5	Process data DO-1.0 to DO-1.7, table below
6	Reserved = 0
7	Reserved = 0

ID No.:	Process data		Process image: (16 A (outputs), DO 0.0 to DO 1.7)
1001	DO- 0.	0	Motor right
1002		1	Motor left
1003		2	Available
1004		3	Trip reset
1005		4	Emergency start
1006		5	Available
1007		6	Slow speed
1008		7	Available
1009	DO- 1.	0	Output 1
1010		1	Output 2
1011		2	Parameter set Bit 0
1012		3	Parameter set Bit 1
1013		4	Available
1014		5	Available
1015		6	Available
1016		7	Disable quick stop

Table 8-17: Data set 68 - reading/writing the process image of the outputs

Byte	Meaning
	Process image of the inputs
0	Process data DI-0.0 to DI-0.7, table below
1	Process data DI-1.0 to DI-1.7, table below
2	Reserved = 0
3	Reserved = 0

ID No.:	Process data		Process image: (16 I (inputs), DI 0.0 to DI 1.7)
1101	DI- 0.	0	Ready (automatic)
1102		1	Motor on
1103		2	Group error
1104		3	Group warning
1105		4	Input 1
1106		5	Input 2
1107		6	Input 3
1108		7	Input 4
1109	DI- 1.	0	Motor current $I_{act\text{-}bit0}$
1110		1	Motor current $I_{act\text{-}bit1}$
1111		2	Motor current $I_{act\text{-}bit2}$
1112		3	Motor current $I_{act\text{-}bit3}$
1113		4	Motor current $I_{act\text{-}bit4}$
1114		5	Motor current $I_{act\text{-}bit5}$
1115		6	Manual operation local operating mode
1116		7	Ramp operation

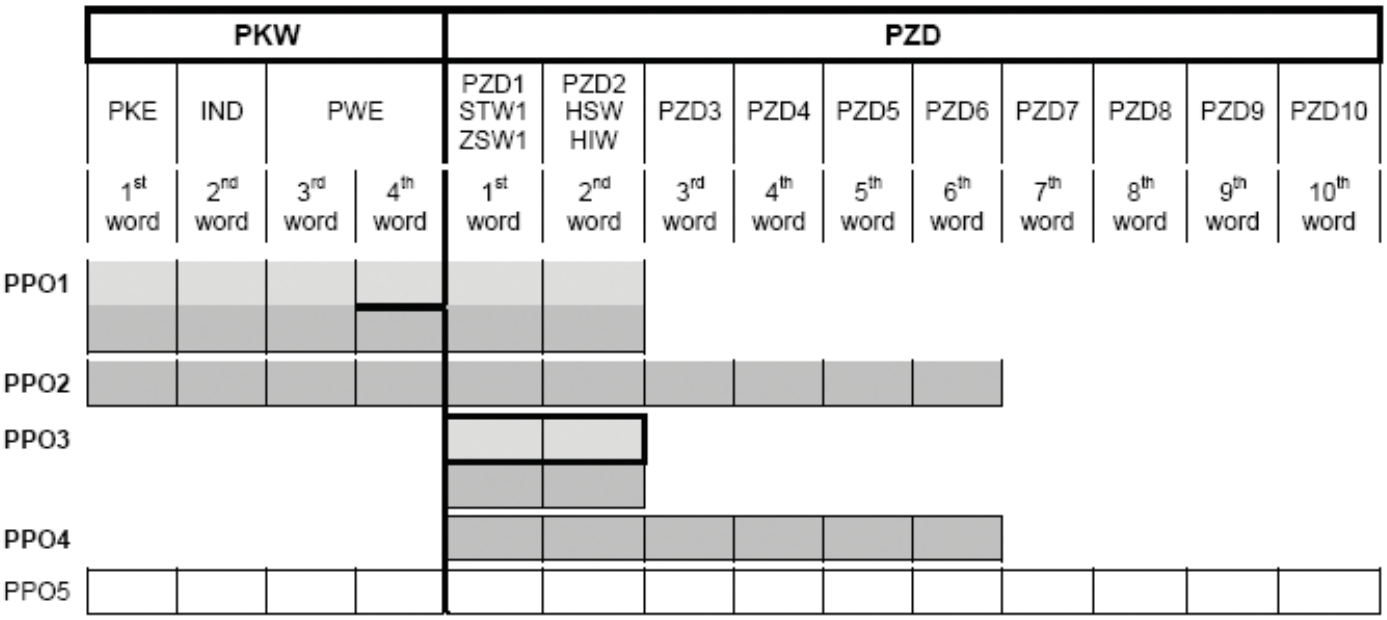
Table 8-18: Data set 69 - reading the process image of the inputs

Table 3-1 Control word 1 bit assignments

Bit	Value	Meaning	Remarks
0	1	ON	Sets the inverter to the "Ready to run" state, direction of rotation must be defined via bit 11
	0	OFF1	Shutdown, deceleration along RFG ramp, pulse disable when $f<f_{min}$
1	1	Operating condition	-
	0	OFF2	Instantaneous pulse disable, drive coasts to a standstill
2	1	Operating condition	-
	0	OFF3	Rapid stop: Shutdown at fastest possible acceleration rate
3	1	Enable operation	Closed-loop control and inverter pulses are enabled
	0	Disable operation	Closed-loop control and inverter pulses are disabled
4	1	Operating condition	-
	0	Disable ramp-function generator	Output of RFG is set to 0 (fastest possible braking operation), inverter remains in the ON state
5	1	Enable RFG	-
	0	Stop RFG	Setpoint currently supplied by the RFG is "frozen"
6	1	Enable setpoint	Value selected at the RFG input is activated.
	0	Disable setpoint	Value selected at the RFG input is set to 0.
7	1	Acknowledge fault	Fault is acknowledged with a positive edge, inverter then switches to "starting lockout" state
	0	No meaning	
8	1	CW inching	
	0		
9	1	CCW inching	
	0		
10	1	Setpoints valid	Master transfers valid setpoints
	0	Setpoints invalid	
11	1	Setpoint inverted	Motor rotates CCW in response to positive setpoint
	0	Setpoint is not inverted	Motor rotates CW in response to positive setpoint
12	-	-	Not used
13	1	Motor potentiometer UP	
	0		
14	1	Motor potentiometer DOWN	
	0		
15	-	-Local control (BOP/AOP)	Local control active
		Remote control	Remote control active

Table 3-3 Bit assignments, status word 1

Bit	Value	Meaning	Remarks
0	1	Ready for ON	Power supply switched on, electronics initialized, pulses disabled
	0	Not ready for ON	
1	1	Ready to run	(see control word bit 0) Converter is switched on (ON command is applied), no fault is active, inverter can start when "Enable operation" command is issued.
	0	Not ready to run	Causes: No ON command, fault, OFF2 or OFF3 command, starting lockout
2	1	Operation enabled	See control word, bit 3
	0	Operation disabled	
3	1	Fault is active	Fault, see fault parameter r0947 etc. Drive is faulty and thus inoperative, switches to starting lockout state after successful correction and acknowledgement of fault.
	0	-	
4	1	-	
	0	OFF2 command applied	See control word, bit 1
5	1	-	
	0	OFF3 command applied	See control word, bit 2
6	1	Starting lockout	Drive can be restarted only by OFF1 followed by ON
	0	No starting lockout	
7	1	Alarm is active	Alarm, see alarm parameter r2110. Drive still in operation.
	0	-	
8	1	No setpoint/act.val. deviation	Setpoint/actual value deviation within tolerance range
	0	Setpoint/act.val. deviation	
9	1	Master control requested	The master is being requested to accept status as master control.
	0	Local operation	The master is not currently the master control.
10	1	f reached	Converter output frequency is higher or equal to the maximum frequency
	0	f not reached	
11	1		
	0	Alarm: Motor at current limit	
12	1		Signal can be used to control a holding brake.
	0	Motor holding brake	
13	1		Motor data indicate overload condition
	0	Motor overload	
14	1	CW rotation	
	0	CCW rotation	
15	1		e.g. current or temperature
	0	Converter overload	



PKW: Parameter identifier value
PZD: Process data
PKE: Parameter identifier
IND: Index
PWE: Parameter value

STW: Control word 1
ZSW: Status word 1
HSW: Main setpoint
HIW: Main actual value

What this essentially means that the cyclic data (space occupied on the profibus network for this unit) will be 12 bytes in and 12 bytes out.

Bytes Out	Meaning	Chart Ref
0 1	Control word (defined above)	STW1
2-3	Frequency reference to the VFD (0 -6000)	HSW

Bytes In	Meaning	Chart Ref
0 1	Status word (defined above)	ZSW
2-3	Speed feedback in HZ (0 – 6000)	HIW

The rest of the bytes (8) are used by the PLC program to transfer parameters and data between the drive and the PLC.

Siemens Industry, Inc.
Control Components and Systems Engineering
Smart MCC
5300 Triangle Parkway
Norcross, GA 30092

Subject to change without prior notice
Order No.: CCIM-TIAGU-0111
Printed in USA

www.usa.siemens.com