Using I-87117 and I-87118

1. Using i-87117W

If you are using the i-87118, please refer to section 2 - “Using i-87118”

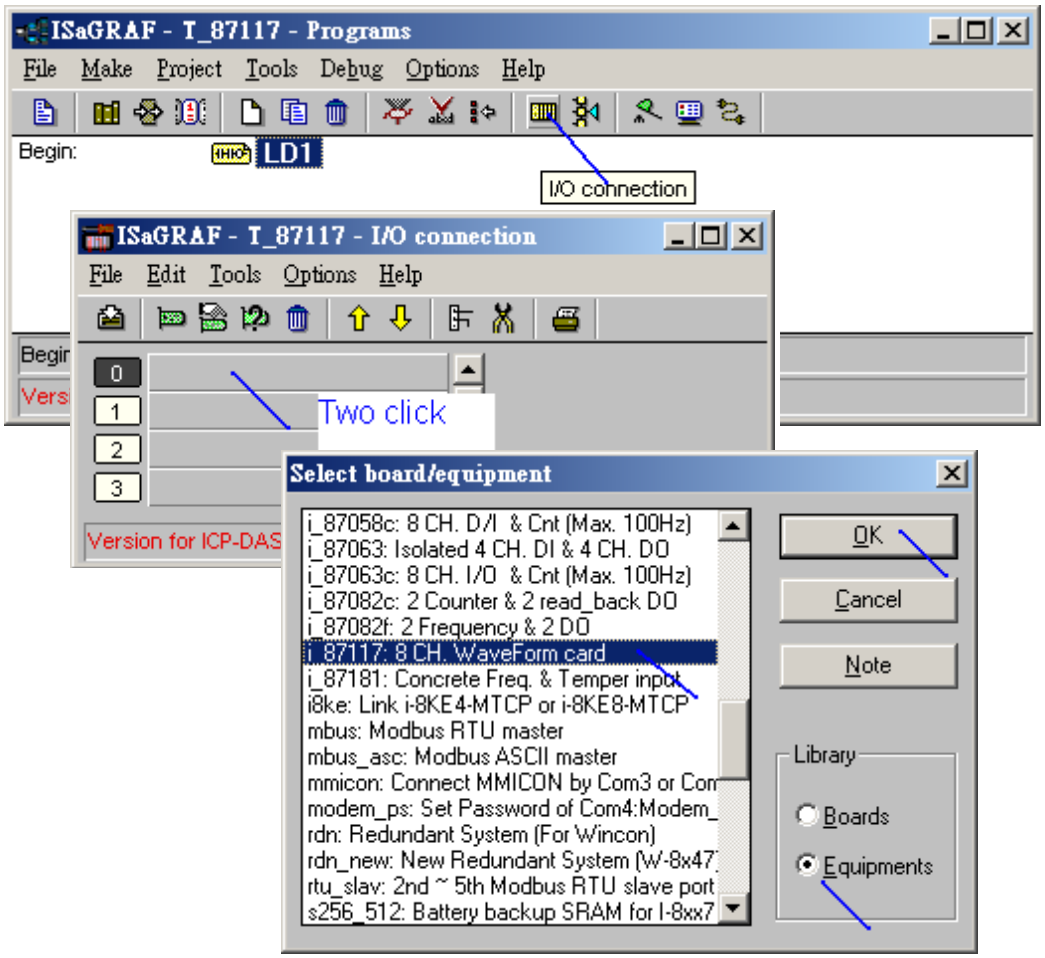
Note:
1. Please refer to Chapter 1.1 and 1.2 of the ISaGRAF User's Manual to install the ISaGRAF wrokbench and ICP DAS utilities in your PC. The complete manual is burned in the i-8000 CD-ROM:\napdos\isagraf\8000\english_manu\”user_manual_i_8xx7.pdf” and “user_manual_i_8xx7_appendix.pdf”
or visit http://www.icpdas.com/products/PAC/i-8000/getting_started_manual.htm

2. Before you can use the iPAC-8803 plus the i-87117 and i-87017W-E5, please make sure if your iPAC-8803 has installed the correct ISaGRAF driver. (please refer to Appendix A)

3. To make sure if your ISaGRAF software in PC has installed the I/O library of i-87117 and i-87017W-E5 , please refer to Appendix B.

4. Please refer to to Appendix C to set the correct IP and mask address of the iPAC-8803.

5. In your ISaGRAF program, please connect the complex equipmenet “i_87117” in the IO connection windows to the correct slot No. as below.



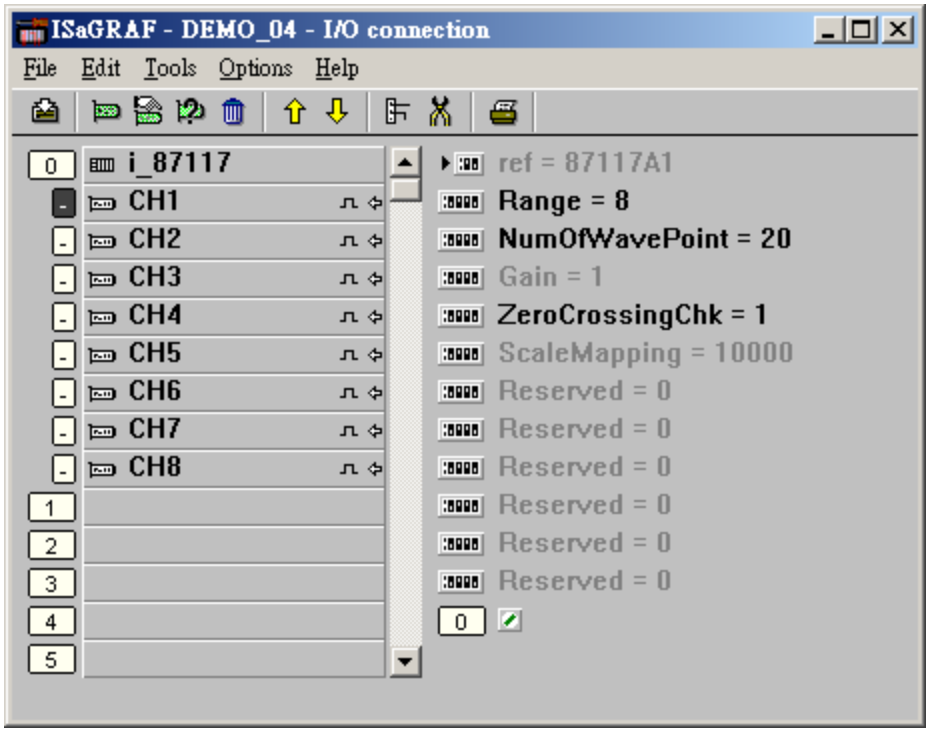
Then set proper “Range” and “NumOfWavePoint” in each channel.

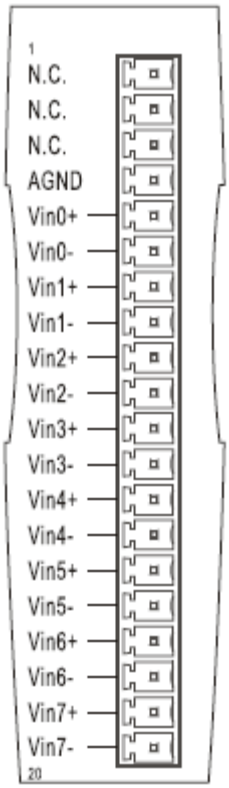
Range : Can be 5, 8, 9 or 1D

5 : Voltage input , -2.5 to +2.5 V
8 : Voltage input , -10.0 to +10.0 V (default rage)
9 : Voltage input , -5.0 to +5.0 V
1D : Current input , -31.25 to +31.25 A

NumOfWavePoint :
number of points inside one single waveform. Value can be 10 , 20 , 40 , 60 or 100 . Setting as wrong value will use the default value of 20 .

ZeroCrossingChk : Default is 1, it means eanble zero crossing check. If setting it as 0 will disable it. (For AC input, please enable it. For straight line DC input, that is voltage / current is not changing , please disable it)





There are 8 analog channels in the i-87117 . Please plug them in the slot 0 through 7 of the iPAC-8803. **The i-87117 can not be used in the RS-485 remote I/O expansion base** .The HMI like InduSoft can Read / Write iPAC-8803 via Modbus RTU protocol or via Modbus TCP/IP protocol. Each channel in the i-87117 has a absolute Modbus address area which has 500 Modbus number in the iPAC-8803.

Table 1

Slot	***Channel***	***Address***	***Slot***	***Channel***	***Address***	***Slot***	***Channel***	***Address***
0	1	20001 - 20500	**3**	1	32001 - 32500	**6**	1	44001 - 44500
	2	20501 - 21000		2	32501 - 33000		2	44501 - 45000
	3	21001 - 21500		3	33001 - 33500		3	45001 - 45500
	4	21501 - 22000		4	33501 - 34000		4	45501 - 46000
	5	22001 - 22500		5	34001 - 34500		5	46001 - 46500
	6	22501 - 23000		6	34501 - 35000		6	46501 - 47000
	7	23001 - 23500		7	35001 - 35500		7	47001 - 47500
	8	23501 - 24000		8	35501 - 36000		8	47501 - 48000
1	1	24001 - 24500	**4**	1	36001 - 36500	**7**	1	48001 - 48500
	2	24501 - 25000		2	36501 - 37000		2	48501 - 49000
	3	25001 - 25500		3	37001 - 37500		3	49001 - 49500
	4	25501 - 26000		4	37501 - 38000		4	49501 - 50000
	5	26001 - 26500		5	38001 - 38500		5	50001 - 50500
	6	26501 - 27000		6	38501 - 39000		6	50501 - 51000
	7	27001 - 27500		7	39001 - 39500		7	51001 - 51500
	8	27501 - 28000		8	39501 - 40000		8	51501 - 52000
2	1	28001 - 28500	**5**	1	40001 - 40500			
	2	28501 - 29000		2	40501 - 41000			
	3	29001 - 29500		3	41001 - 41500			
	4	29501 - 30000		4	41501 - 42000			
	5	30001 - 30500		5	42001 - 42500			
	6	30501 - 31000		6	42501 - 43000			
	7	31001 - 31500		7	43001 - 43500			
	8	31501 - 32000		8	43501 - 44000			

The detailed definition of the Modbus number in the i-87117 's channel area is listed as Table 2. The address in Table 2 is the Offset address. The offset address 1 is mapped to the starting address 1 in the Table1. So the absolute modbus address is the “Offset Address in Table2” plus the “Starting Address of the associated channel in Table 1” minus 1 . That is abs_addr = offset_addr + start_addr – 1 . For example, The absolute Modbus address of the channel 2 's offset 1 of the i-87117 in slot 1 is 24501, its offset 101 has absolute address as 24601 .

Table 2

Offset Address	***Data Type***	***Description***
1	Boolean	Low alarm status of Vpp (Read only)
2	Boolean	High alarm status of Vpp (Read only)
3	Boolean	Low alarm status of Vrms (Read only)
4	Boolean	High alarm status of Vrms (Read only)
5	Boolean	Low alarm status of frequency (Read only)
6	Boolean	High alarm status of frequency (Read only)
7	Boolean	Low alarm status of SINAD (Read only)
8		Reserved
9	Boolean	Low alarm status of min. voltage (Read only)
10	Boolean	High alarm status of min. volatge (Read only)
11	Boolean	Low alarm status of max. voltage (Read only)
12	Boolean	High alarm status of max. voltage (Read only)
13	Boolean	Low alarm status of TT (Read only)
14	Boolean	High alarm status of TT (Read only)
15	Boolean	Low alarm status of TH (Read only)
16	Boolean	High alarm status of TH (Read only)
17	Boolean	Low alarm status of TL (Read only)
18	Boolean	High alarm status of TL (Read only)
19	Boolean	High alarm status of Pattern difference (Read only)
20	Boolean	Return True if any alarm status of item 1 thru. 19 is True. Return False if all alarm status of item 1 thru. 19 are False. (Read only)
21	Boolean	Enable / Disable Vpp alarm checking (Readable & writable)
22	Boolean	Enable / Disable Vrms alarm checking (Readable & writable)
23	Boolean	Enable / Disable Frequency alarm checking (Readable & writable)
24	Boolean	Enable / Disable SINAD alarm checking (Readable & writable)
25	Boolean	Enable / Disable Vmin alarm checking (Readable & writable)
26	Boolean	Enable / Disable Vmax alarm checking (Readable & writable)

Offset Address	*Data Type*	*Description*
27	Boolean	Enable / Disable TT alarm checking (Readable & writable)
28	Boolean	Enable / Disable TH alarm checking (Readable & writable)
29	Boolean	Enable / Disable TL alarm checking (Readable & writable)
30	Boolean	Enable / Disable Pattern difference alarm checking (Readable & writable)
31	Boolean	Clear min. Vpp (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
32	Boolean	Clear max. Vpp (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
33	Boolean	Clear min. Vrms (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
34	Boolean	Clear max. Vrms (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
35	Boolean	Clear min. Frequency (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
36	Boolean	Clear max. Frequency (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
37	Boolean	Clear min. SINAD (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
38	Boolean	Clear max. SINAD (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
39	Boolean	Clear min. voltage (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
40	Boolean	Clear max. voltage (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
41	Boolean	Set current WaveForm as the good pattern. (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
42	Boolean	Clear all min. and max. value. (Readable & writable) This command is equal to the sum of the command 31 thru. 40. (The iPAC-8803 will run it and then will reset it back to False auto.)
43 – 50		Reserved
51	32-bit Integer	**Vpp**. (Read only) If range is 5, unit is 0.0001 V , for ex., -25000 is -2.5 V, 25000 is +2.5V If range is 9, unit is 0.0001 V , for ex., -50000 is -5.0 V, 50000 is +5.0V If range is 8, unit is 0.001 V , for ex., -10000 is -10 V, 10000 is +10V If range is 1D, unit is mA , for ex., -31250 is -31.25 A , 31250 is +31.25A
53	32-bit Integer	Vrms (unit is the same as Vpp) (Read only)

Offset Address	*Data Type*	*Description*
55	32-bit Integer	Frequency, unit is 0.01Hz. For ex, 5000 is 50Hz , 950000 is 9500Hz (Read only)
57	32-bit Integer	SINAD, unit is 0.01 (Read only)
59	32-bit Integer	min Vpp (unit is the same as Vpp) (Read only)
61	32-bit Integer	Date where the min Vpp happened. (Read only) For ex, value 20080926 means Sep.26,2008
63	32-bit Integer	Time where the min Vpp happened (Read only) For ex, value 130943 means 13:09:43
65	32-bit Integer	max Vpp (unit is the same as Vpp) (Read only)
67	32-bit Integer	Date where the max Vpp happened. (Format is same as min Vpp date) (Read only)
69	32-bit Integer	Time where the max Vpp happened. (Format is same as min Vpp time) (Read only)
71	32-bit Integer	min Vrms (unit is the same as Vpp) (Read only)
73	32-bit Integer	Date where the min Vrms happened. (Format is same as min Vpp date) (Read only)
75	32-bit Integer	Time where the min Vrms happened. (Format is same as min Vpp time) (Read only)
77	32-bit Integer	max Vrms (unit is the same as Vpp) (Read only)
79	32-bit Integer	Date where the max Vrms happened. (Format is same as min Vpp date) (Read only)
81	32-bit Integer	Time where the max Vrms happened. (Format is same as min Vpp time) (Read only)
83	32-bit Integer	min Frequency, unit is 0.01Hz (Read only)
85	32-bit Integer	Date where the min Frequency happened. (Read only) (Format is same as min Vpp date)
87	32-bit Integer	Time where the min Frequency happened. (Read only) (Format is same as min Vpp time)
89	32-bit Integer	max Frequency, unit is 0.01Hz (Read only)
91	32-bit Integer	Date where the max Frequency happened. (Read only) (Format is same as min Vpp date)
93	32-bit Integer	Time where the max Frequency happened. (Read only) (Format is same as min Vpp time)
95	32-bit Integer	min SINAD, unit is 0.01 (Read only)
97	32-bit Integer	Date where the min SINAD happened. (Format is same as min Vpp date) (Read only)

Offset Address	*Data Type*	*Description*
99	32-bit Integer	Time where the min SINAD happened. (Format is same as min Vpp time) (Read only)
101	32-bit Integer	max SINAD, unit is 0.01 (Read only)
103	32-bit Integer	Date where the max SINAD happened. (Format is same as min Vpp date) (Read only)
105	32-bit Integer	Time where the max SINAD happened. (Format is same as min Vpp time) (Read only)
107	32-bit Integer	Min. voltage (unit is the same as Vpp) (Read only)
109	32-bit Integer	Date where the min. voltage happened. (Format is same as min Vpp date) (Read only)
111	32-bit Integer	Time where the min. voltage happened. (Format is same as min Vpp time) (Read only)
113	32-bit Integer	Max. voltage (unit is the same as Vpp) (Read only)
115	32-bit Integer	Date where the max voltage happened. (Format is same as min Vpp date) (Read only)
117	32-bit Integer	Time where the max voltage happened. (Format is same as min Vpp time) (Read only)
119	32-bit Integer	current min. voltage (unit is the same as Vpp) (Read only)
121	32-bit Integer	current max. voltage (unit is the same as Vpp) (Read only)
123	32-bit Integer	current TT, unit is 0.00001ms (0.00000001 second) (Read only)
125	32-bit Integer	current TH, unit is 0.00001ms (0.00000001 second) (Read only)
127	32-bit Integer	current TL, unit is 0.00001ms (0.00000001 second) (Read only)
129	32-bit Integer	current Patern difference (unit is the same as Vpp) (Read only)
131	32-bit Integer	Date where the Alarm happened. (Read only) For ex, value 20080926 means Sep.26,2008
133	32-bit Integer	Time where the Alarm happened. (Read only) For ex, value 071559 means 07:15:59
135	32-bit Integer	The sampling number of one WaveForm. (amount of points in one waveform) (Read only) Value is one of 10, 20, 40, 60, 100 (This value is set in the ISaGRAF)
137 – 140		Reserved
141	32-bit Integer	Low alarm setting of Vpp (unit is the same as Vpp) (This value can only be positive, not negative) (Readable & writable)

Offset Address	*Data Type*	*Description*
143	32-bit Integer	High alarm setting of Vpp (unit is the same as Vpp) (This value can only be positive, not negative) (Readable & writable)
145	32-bit Integer	Low alarm setting of Vrms (unit is the same as Vpp) (Readable & writable)
147	32-bit Integer	High alarm setting of Vrms (unit is the same as Vpp) (Readable & writable)
149	32-bit Integer	Low alarm setting of Frequency, unit is 0.01Hz (This value can only be positive, not negative) (Readable & writable)
151	32-bit Integer	High alarm setting of Frequency, unit is 0.01Hz (This value can only be positive, not negative) (Readable & writable)
153	32-bit Integer	Low alarm setting of SINAD, unit is 0.01 (Readable & writable)
155		Reserved
157	32-bit Integer	Low alarm setting of Vmin, (unit is the same as Vpp) (Readable & writable)
159	32-bit Integer	High alarm setting of Vmin (unit is the same as Vpp) (Readable & writable)
161	32-bit Integer	Low alarm setting of Vmax (unit is the same as Vpp) (Readable & writable)
163	32-bit Integer	High alarm setting of Vmax (unit is the same as Vpp) (Readable & writable)
165	32-bit Integer	Low alarm setting of TT, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
167	32-bit Integer	High alarm setting of TT, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
169	32-bit Integer	Low alarm setting of TH, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
171	32-bit Integer	High alarm setting of TH, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
173	32-bit Integer	Low alarm setting of TL, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
175	32-bit Integer	High alarm setting of TL, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
177	32-bit Integer	High Alarm setting of Patern difference, unit is mV (0.001 Volt) (This value can only be positive, not negative) (unit is the same as Vpp) (Readable & writable)

Offset Address	*Data Type*	*Description*
179	32-bit Integer	The time gap between two sampling points in one WaveForm. unit is 0.001 ms (micro- second) . i-87117 : Value can be 5 to 1000 i-87118 : Value can be 1 to 1000 (This value can only be positive, not negative) (Readable & writable)
181 – 200		Reserved
201 – 300	16-bit Integer	Current WaveForm Point (max. 100 sampling points in one waveform) Each 16-bit Integer contains one sampling points. . If "range" = "5", value -32768 means -2.5 V , +32767 is +2.5 V If "range" = "9", value -32768 means -5.0 V , +32767 is +5.0 V If "range" = "8", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "1D", value --32768 means -31.25A, +32767 is +31.25A
301 - 400	16-bit Integer	Alarm WaveForm Point (max. 100 sampling points in one waveform) Each 16-bit Integer contains one sampling points. . If "range" = "5", value -32768 means -2.5 V , +32767 is +2.5 V If "range" = "9", value -32768 means -5.0 V , +32767 is +5.0 V If "range" = "8", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "1D", value --32768 means -31.25A, +32767 is +31.25A
401 - 500	16-bit Integer	WaveForm of the good patern (max. 100 sampling points) Each 16-bit Integer contains one sampling points. . If "range" = "5", value -32768 means -2.5 V , +32767 is +2.5 V If "range" = "9", value -32768 means -5.0 V , +32767 is +5.0 V If "range" = "8", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "1D", value --32768 means -31.25A, +32767 is +31.25A

2. Using i-87118W

If you are using the i-87117, please refer to section 1 - “Using i-87117”

Note:

1. Please refer to Chapter 1.1 and 1.2 of the ISaGRAF User's Manual to install the ISaGRAF wrokbench and ICP DAS utilities in your PC. The complete manual is burned in the i-8000 CD-ROM:\napdos\isagraf\8000\english_manu\”user_manual_i_8xx7.pdf” and “user_manual_i_8xx7_appendix.pdf”
or visit http://www.icpdas.com/products/PAC/i-8000/getting_started_manual.htm

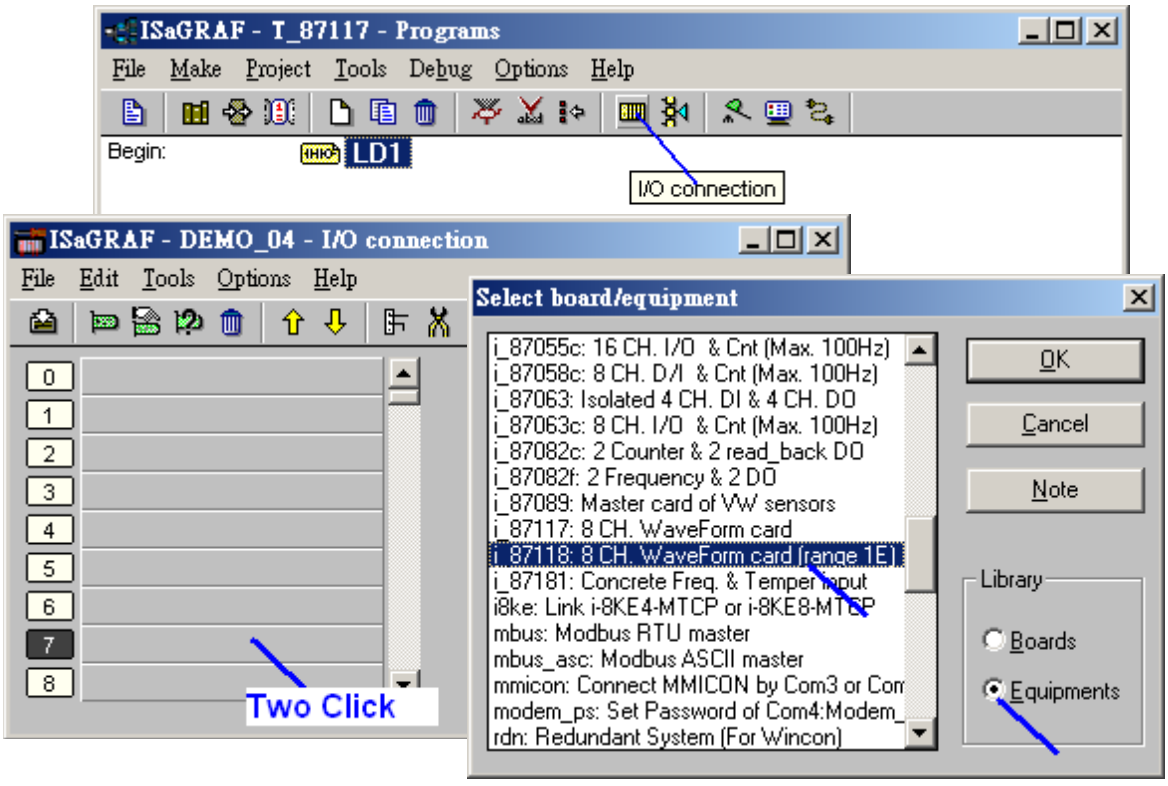
2. Before you can use the iPAC-8803 plus the i-87118 and i-87017W-E5, please make sure if your iPAC-8803 has installed the correct ISaGRAF driver. (please refer to Appendix A)

3. To make sure if your ISaGRAF software in PC has installed the I/O library of i-87117, i-87118 and i-87017W-E5 , please refer to Appendix B.

4. Please refer to to Appendix C to set the correct IP and mask address of the iPAC-8803.

5. In your ISaGRAF program, please connect the complex equipmenet “i_87118” in the IO connection windows to the correct slot No. as below.

Note: One iPAC-8803 can accept only max. three i-87118 in its **Slot 5 thru. 7**.



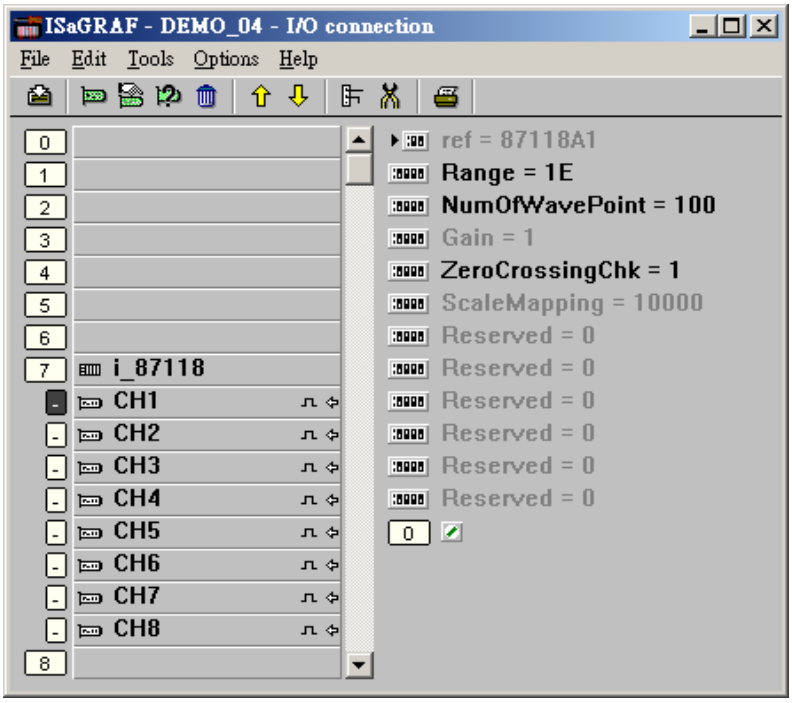
Then set proper “Range” and “NumOfWavePoint” in each channel.

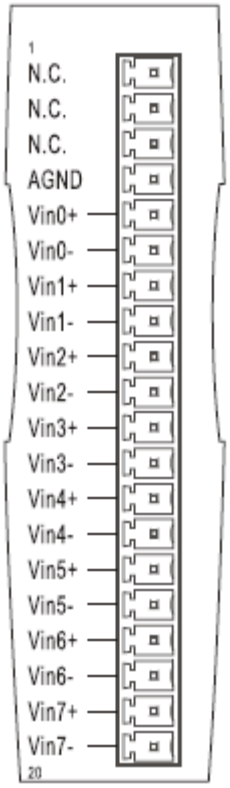
Note:
1. One iPAC-8803 can accept only max. three **i-87118** (**range=1E**) in its **Slot 5 thru. 7**.
2. If setting i-87118's range as 5, 8, 9, or 1D, then it becomes i-87117. In this case you can plug it at slot 0 thru. 7 just like the real i-87117 card does. (Please refer the data of the i-87117)
3. If setting range as 1E, the “NumOfWavePoint” of the 56KHz signal is always using 100 points. Time gap between two points is always 1 (micro-second , that is 0.000001 second). The 9KHz signal will use the same time gap but its “NumOfWavePoint” can be set as 20, 40, 60 or 100. (recommend to set “NumOfWavePoint” to 100 for 9KHz signal if range = 1E)

Range : Can be 1E , 5 , 8 , 9 or 1D
1E : Voltage input with 9KHz signal plus 56KHz signal , -10.0 to +10.0 V (Default range)
5 : Voltage input , -2.5 to +2.5 V
8 : Voltage input , -10.0 to +10.0 V
9 : Voltage input , -5.0 to +5.0 V
1D : Current input , -31.25 to +31.25 A

NumOfWavePoint :
number of points inside the waveform diagram. Value can be 10 , 20 , 40 , 60 or 100 . Setting as wrong value will use the default value of 20 . If the “Range” is 1E, then this “NumOfWavePoint” setting is only for 9KHz signal. The 56KHz signal always uses setting value as 100.

ZeroCrossingChk : Default is 1, it means eanble zero crossing check. If setting it as 0 will disable it. (For AC input, please enable it. For straight line DC input, that is voltage / current is not changing , please disable it)





There are 8 analog channels in the i-87118 . If setting the “Range” as 1E, it can be plugged only in the slot 5 through 7 of the iPAC-8803. **The i-87118 can not be used in the RS-485 remote I/O expansion base** .The HMI like InduSoft can Read / Write iPAC-8803 via Modbus RTU protocol or via Modbus TCP/IP protocol. Each channel in the i-87118 has a absolute Modbus address area which has 1000 Modbus number in the iPAC-8803.

Table 1

Slot	***Channel***	***Address***	***Slot***	***Channel***	***Address***	***Slot***	***Channel***	***Address***
5 9K Hz	1	40001 - 40500	**6 9K Hz**	1	44001 - 44500	**7 9K Hz**	1	48001 - 48500
	2	40501 - 41000		2	44501 - 45000		2	48501 - 49000
	3	41001 - 41500		3	45001 - 45500		3	49001 - 49500
	4	41501 - 42000		4	45501 - 46000		4	49501 - 50000
	5	42001 - 42500		5	46001 - 46500		5	50001 - 50500
	6	42501 - 43000		6	46501 - 47000		6	50501 - 51000
	7	43001 - 43500		7	47001 - 47500		7	51001 - 51500
	8	43501 - 44000		8	47501 - 48000		8	51501 - 52000
5 56K Hz	1	52001 - 52500	**6 56K Hz**	1	56001 - 56500	**7 56K Hz**	1	60001 - 60500
	2	52501 - 53000		2	56501 - 57000		2	60501 - 61000
	3	53001 - 53500		3	57001 - 57500		3	61001 - 61500
	4	53501 - 54000		4	57501 - 58000		4	61501 - 62000
	5	54001 - 54500		5	58001 - 58500		5	62001 - 62500
	6	54501 - 55000		6	58501 - 59000		6	62501 - 63000
	7	55001 - 55500		7	59001 - 59500		7	63001 - 63500
	8	55501 - 56000		8	59501 - 60000		8	63501 - 64000

The detailed definition of the Modbus number in the i-87118 's channel area is listed as Table 2. The address in Table 2 is the Offset address. The offset address 1 is mapped to the starting address 1 in the Table1. So the absolute modbus address is the “Offset Address in Table2” plus the “Starting Address of the associated channel in Table 1” minus 1 . That is abs_addr = offset_addr + start_addr – 1 . For example, The absolute Modbus address of the 56KHz channel 2 's offset 1 of the i-87118 in slot 7 is 60501, its offset 101 has absolute address as 60601 .

Table 2

Offset Address	***Data Type***	***Description***
1	Boolean	Low alarm status of Vpp (Read only)
2	Boolean	High alarm status of Vpp (Read only)
3	Boolean	Low alarm status of Vrms (Read only)
4	Boolean	High alarm status of Vrms (Read only)
5	Boolean	Low alarm status of frequency (Read only)
6	Boolean	High alarm status of frequency (Read only)
7	Boolean	Low alarm status of SINAD (Read only)
8		Reserved
9	Boolean	Low alarm status of min. voltage (Read only)
10	Boolean	High alarm status of min. volatge (Read only)
11	Boolean	Low alarm status of max. voltage (Read only)
12	Boolean	High alarm status of max. voltage (Read only)
13	Boolean	Low alarm status of TT (Read only)
14	Boolean	High alarm status of TT (Read only)
15	Boolean	Low alarm status of TH (Read only)
16	Boolean	High alarm status of TH (Read only)
17	Boolean	Low alarm status of TL (Read only)
18	Boolean	High alarm status of TL (Read only)
19	Boolean	High alarm status of Pattern difference (Read only)
20	Boolean	Return True if any alarm status of item 1 thru. 19 is True. Return False if all alarm status of item 1 thru. 19 are False. (Read only)
21	Boolean	Enable / Disable Vpp alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
22	Boolean	Enable / Disable Vrms alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**

Offset Address	*Data Type*	*Description*
23	Boolean	Enable / Disable Frequency alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
24	Boolean	Enable / Disable SINAD alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
25	Boolean	Enable / Disable Vmin alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
26	Boolean	Enable / Disable Vmax alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
27	Boolean	Enable / Disable TT alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
28	Boolean	Enable / Disable TH alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
29	Boolean	Enable / Disable TL alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
30	Boolean	Enable / Disable Pattern difference alarm checking (Readable & writable) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
31	Boolean	Clear min. Vpp (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
32	Boolean	Clear max. Vpp (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
33	Boolean	Clear min. Vrms (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
34	Boolean	Clear max. Vrms (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**

Offset Address	*Data Type*	*Description*
35	Boolean	Clear min. Frequency (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
36	Boolean	Clear max. Frequency (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
37	Boolean	Clear min. SINAD (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
38	Boolean	Clear max. SINAD (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
39	Boolean	Clear min. voltage (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
40	Boolean	Clear max. voltage (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
41	Boolean	Set current WaveForm as the good pattern. (Readable & writable) (The iPAC-8803 will run it and then will reset it back to False auto.)
42	Boolean	Clear all min. and max. value. (Readable & writable) This command is equal to the sum of the command 31 thru. 40. (The iPAC-8803 will run it and then will reset it back to False auto.) **Address for 9KHz signal only (no such an address for 56KHz)** **(It will Enable / Disable both of 9KHz and 56KHz)**
43 – 50		Reserved
51	32-bit Integer	**Vpp**. (Read only) If range is 1E,unit is 0.001 V , for ex., -10000 is -10 V, 10000 is +10V If range is 5, unit is 0.0001 V , for ex., -25000 is -2.5 V, 25000 is +2.5V If range is 9, unit is 0.0001 V , for ex., -50000 is -5.0 V, 50000 is +5.0V If range is 8, unit is 0.001 V , for ex., -10000 is -10 V, 10000 is +10V If range is 1D, unit is mA , for ex., -31250 is -31.25 A , 31250 is +31.25A
53	32-bit Integer	Vrms (unit is the same as Vpp) (Read only)

Offset Address	*Data Type*	*Description*
55	32-bit Integer	Frequency, unit is 0.01Hz. For ex, 5000 is 50Hz , 950000 is 9500Hz (Read only)
57	32-bit Integer	SINAD, unit is 0.01 (Read only)
59	32-bit Integer	min Vpp (unit is the same as Vpp) (Read only)
61	32-bit Integer	Date where the min Vpp happened. (Read only) For ex, value 20080926 means Sep.26,2008
63	32-bit Integer	Time where the min Vpp happened (Read only) For ex, value 130943 means 13:09:43
65	32-bit Integer	max Vpp (unit is the same as Vpp) (Read only)
67	32-bit Integer	Date where the max Vpp happened. (Format is same as min Vpp date) (Read only)
69	32-bit Integer	Time where the max Vpp happened. (Format is same as min Vpp time) (Read only)
71	32-bit Integer	min Vrms (unit is the same as Vpp) (Read only)
73	32-bit Integer	Date where the min Vrms happened. (Format is same as min Vpp date) (Read only)
75	32-bit Integer	Time where the min Vrms happened. (Format is same as min Vpp time) (Read only)
77	32-bit Integer	max Vrms (unit is the same as Vpp) (Read only)
79	32-bit Integer	Date where the max Vrms happened. (Format is same as min Vpp date) (Read only)
81	32-bit Integer	Time where the max Vrms happened. (Format is same as min Vpp time) (Read only)
83	32-bit Integer	min Frequency, unit is 0.01Hz (Read only)
85	32-bit Integer	Date where the min Frequency happened. (Read only) (Format is same as min Vpp date)
87	32-bit Integer	Time where the min Frequency happened. (Read only) (Format is same as min Vpp time)
89	32-bit Integer	max Frequency, unit is 0.01Hz (Read only)
91	32-bit Integer	Date where the max Frequency happened. (Read only) (Format is same as min Vpp date)
93	32-bit Integer	Time where the max Frequency happened. (Read only) (Format is same as min Vpp time)
95	32-bit Integer	min SINAD, unit is 0.01 (Read only)
97	32-bit Integer	Date where the min SINAD happened. (Format is same as min Vpp date) (Read only)

Offset Address	*Data Type*	*Description*
99	32-bit Integer	Time where the min SINAD happened. (Format is same as min Vpp time) (Read only)
101	32-bit Integer	max SINAD, unit is 0.01 (Read only)
103	32-bit Integer	Date where the max SINAD happened. (Format is same as min Vpp date) (Read only)
105	32-bit Integer	Time where the max SINAD happened. (Format is same as min Vpp time) (Read only)
107	32-bit Integer	Min. voltage (unit is the same as Vpp) (Read only)
109	32-bit Integer	Date where the min. voltage happened. (Format is same as min Vpp date) (Read only)
111	32-bit Integer	Time where the min. voltage happened. (Format is same as min Vpp time) (Read only)
113	32-bit Integer	Max. voltage (unit is the same as Vpp) (Read only)
115	32-bit Integer	Date where the max voltage happened. (Format is same as min Vpp date) (Read only)
117	32-bit Integer	Time where the max voltage happened. (Format is same as min Vpp time) (Read only)
119	32-bit Integer	current min. voltage (unit is the same as Vpp) (Read only)
121	32-bit Integer	current max. voltage (unit is the same as Vpp) (Read only)
123	32-bit Integer	current TT, unit is 0.00001ms (0.00000001 second) (Read only)
125	32-bit Integer	current TH, unit is 0.00001ms (0.00000001 second) (Read only)
127	32-bit Integer	current TL, unit is 0.00001ms (0.00000001 second) (Read only)
129	32-bit Integer	current Patern difference (unit is the same as Vpp) (Read only)
131	32-bit Integer	Date where the Alarm happened. (Read only) For ex, value 20080926 means Sep.26,2008
133	32-bit Integer	Time where the Alarm happened. (Read only) For ex, value 071559 means 07:15:59
135	32-bit Integer	The sampling number of one WaveForm. (amount of points in one waveform) (Read only) Value is one of 10, 20, 40, 60, 100 (This value is set in the ISaGRAF)
137 – 140		Reserved
141	32-bit Integer	Low alarm setting of Vpp (unit is the same as Vpp) (This value can only be positive, not negative) (Readable & writable)

Offset Address	*Data Type*	*Description*
143	32-bit Integer	High alarm setting of Vpp (unit is the same as Vpp) (This value can only be positive, not negative) (Readable & writable)
145	32-bit Integer	Low alarm setting of Vrms (unit is the same as Vpp) (Readable & writable)
147	32-bit Integer	High alarm setting of Vrms (unit is the same as Vpp) (Readable & writable)
149	32-bit Integer	Low alarm setting of Frequency, unit is 0.01Hz (This value can only be positive, not negative) (Readable & writable)
151	32-bit Integer	High alarm setting of Frequency, unit is 0.01Hz (This value can only be positive, not negative) (Readable & writable)
153	32-bit Integer	Low alarm setting of SINAD, unit is 0.01 (Readable & writable)
155		Reserved
157	32-bit Integer	Low alarm setting of Vmin, (unit is the same as Vpp) (Readable & writable)
159	32-bit Integer	High alarm setting of Vmin (unit is the same as Vpp) (Readable & writable)
161	32-bit Integer	Low alarm setting of Vmax (unit is the same as Vpp) (Readable & writable)
163	32-bit Integer	High alarm setting of Vmax (unit is the same as Vpp) (Readable & writable)
165	32-bit Integer	Low alarm setting of TT, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
167	32-bit Integer	High alarm setting of TT, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
169	32-bit Integer	Low alarm setting of TH, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
171	32-bit Integer	High alarm setting of TH, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
173	32-bit Integer	Low alarm setting of TL, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
175	32-bit Integer	High alarm setting of TL, unit is 0.00001ms (0.00000001 second) (This value can only be positive, not negative) (Readable & writable)
177	32-bit Integer	High Alarm setting of Patern difference, unit is mV (0.001 Volt) (This value can only be positive, not negative) (unit is the same as Vpp) (Readable & writable)

Offset Address	*Data Type*	*Description*
179	32-bit Integer	The time gap between two sampling points in one WaveForm. unit is 0.001 ms (micro- second) . i-87117 : Value can be 5 to 1000 i-87118 : Value can be 1 to 1000 **Value is always 1 for i-87118 Range = 1E (not changeable for Range 1E)** (This value can only be positive, not negative) (Readable & writable)
181 – 200		Reserved
201 – 300	16-bit Integer	Current WaveForm Point (**always 100 sampling points for the 56KHz signal**) (**max. 100 sampling points for the 9KHz signal**) Each 16-bit Integer contains one sampling points. . If "range" = "1E", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "5", value -32768 means -2.5 V , +32767 is +2.5 V If "range" = "9", value -32768 means -5.0 V , +32767 is +5.0 V If "range" = "8", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "1D", value --32768 means -31.25A, +32767 is +31.25A
301 - 400	16-bit Integer	Alarm WaveForm Point (**always 100 sampling points for the 56KHz signal**) (**max. 100 sampling points for the 9KHz signal**) Each 16-bit Integer contains one sampling points. . If "range" = "1E", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "5", value -32768 means -2.5 V , +32767 is +2.5 V If "range" = "9", value -32768 means -5.0 V , +32767 is +5.0 V If "range" = "8", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "1D", value --32768 means -31.25A, +32767 is +31.25A
401 - 500	16-bit Integer	WaveForm of the good patern (**always 100 sampling points for the 56KHz signal**) (**max. 100 sampling points for the 9KHz signal**) Each 16-bit Integer contains one sampling points. . If "range" = "1E", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "5", value -32768 means -2.5 V , +32767 is +2.5 V If "range" = "9", value -32768 means -5.0 V , +32767 is +5.0 V If "range" = "8", value -32768 means -10.0 V , +32767 is +10.0 V If "range" = "1D", value --32768 means -31.25A, +32767 is +31.25A

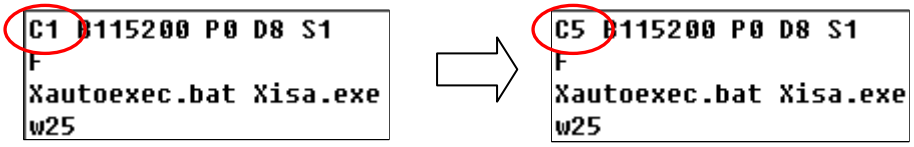
Appendix A: Update iPAC-8803 ISaGRAF driver

To Know The Current Driver Version (We use driver 1.1 as an example)

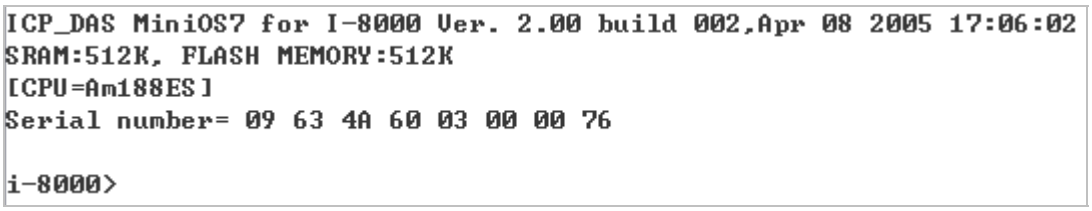
1. Create a file folder named "8000" in your hard drive .For example, "**c:\8000**".
2. Copy all iPAC-8803 driver files into the "**c:\8000**"

   7188xw.exe, 7188xw.f4, 7188xw.ini, ip_20080530.img, autoexec.bat, isa_8803.exe, isa_data.exe

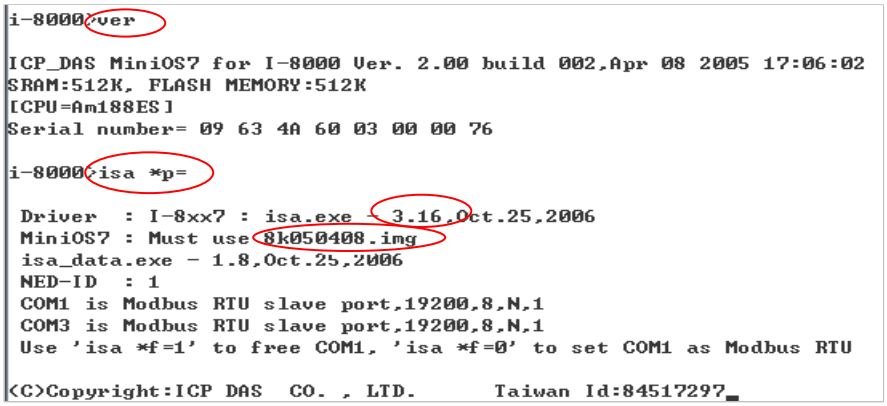
3. Run "\8000\7188xw.exe" in your hard drive. A "7188xw" screen will appear (Press F1 for help).
4. Link COM1 or COM2 of your PC to COM1 of the controller through a RS232 cable. If you use other COM port (ex.COM5), please modify the first line of "7188xw.ini".



5. Power off iPAC, switch the dip on the iPAC-8803 to "INIT" position, then power it up.
6. If the connection is Ok, "i-8000>" messages will appear on the 7188xw screen.



7. Type "ver" to see the current OS version & date.
8. Type "isa_8803 *p=" to see the current driver version No. & setting of the controller.



To Upgrade An ISaGRAF Embedded Driver

1. Power off iPAC, switch the dip on the iPAC-8803 to "INIT" position, then power it up.
2. Press "**F4**" to auto download the following files and reboot system.
   (isa_data.exe, autoexec.bat, isa_8803.exe, ip_20080530.img)

```
i-8000>del /y
Total File number is 2, do you really want to delete(y/n)?

i-8000>LOAD
File will save to 8000:0000
StartAddr-->7000:FFFF
Press ALT_E to download file!
Load file:isa_data.exe[crc=E70F,0000]
Send file info. total 287 blocks
Block 287
Transfer time is: 12.844000 seconds
```

Wait about 60 sec. to update ISaGRAF system & DO NOT REMOVE THE POWER

```
i-8000>bios1
MiniOs7 for 8000 Ver 2.00.002, date=04/08/2005
Checking CRC-16...OK.
Update the OS code. Please wait the message <<Write Finished>>
Erase Flash [F000]
Write Flash
[FF]
<<Write Finished>>OK
Wait WDT reset system...
ICP_DAS MiniOS7 for I-8000 Ver. 2.00 build 002,Apr 08 2005 17:06:02
SRAM:512K, FLASH MEMORY:512K
[CPU=RDC 8820-D]
Serial number= 5A 5A 5A 5A 5A 5A 5A 5A
```

3. Type "dir" to make sure "autoexec.bat" and "isa_8803.exe" are well burned

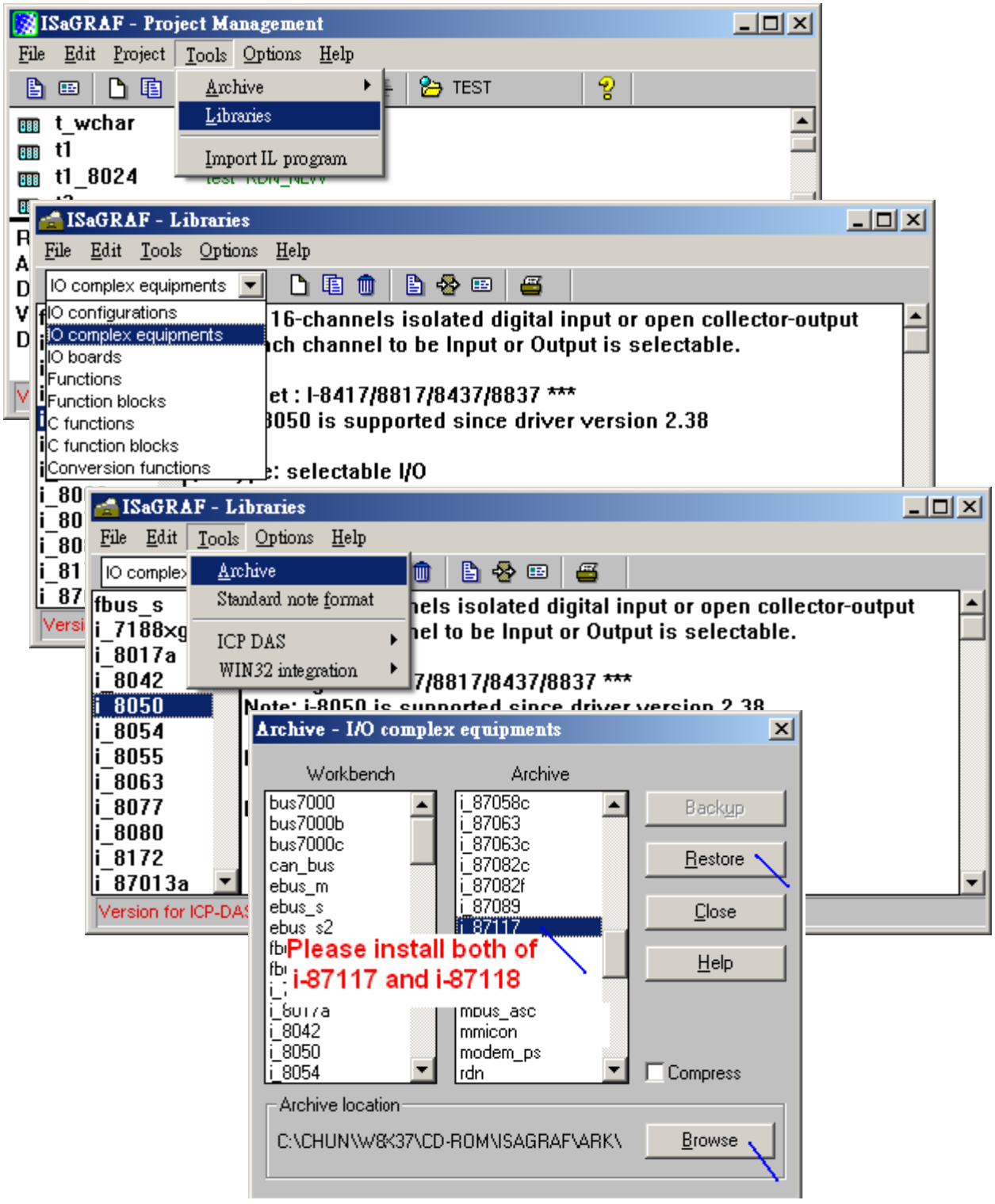
```
i-8000>DIR

 0)autoexec.bat 05/21/2003 06:40:00     22[00016]8002:0000-8003:0006
 1)isa.exe      10/25/2006 10:28:00 180678[2C1C6]8005:0006-AC21:000C
Total File number is 2  Free space=277956 bytes
```

4. Press ALT+X to exit "7188xw".
5. Switch the dip on the iPAC to "Run" position , recycle the power of the controller.

Appendix B: Install the i-87117 and i-87118 I/O library into ISaGRAF software

i-87117 is in the "**IO complex equipments**" while i-87017W-E5 is in the "**IO boards**" selection.

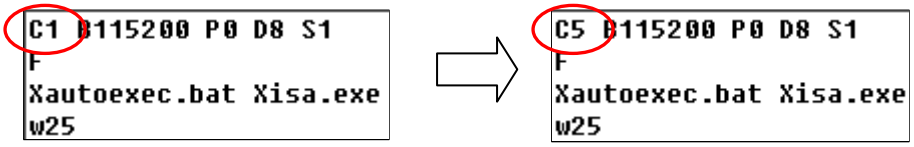


Appendix C: Setting IP and Mask and Gateway Address of the iPAC

1. Create a file folder named "8000" in your hard drive .For example, "**c:\8000**".
2. Copy all iPAC-8803 driver files into the "**c:\8000**"

   7188xw.exe, 7188xw.f4, 7188xw.ini, ip_20080530.img, autoexec.bat, isa_8803.exe, isa_data.exe

3. Run "\8000\7188xw.exe" in your hard drive. A "7188xw" screen will appear (Press F1 for help).
4. link COM1 or COM2 of your PC to COM1 of the controller through a RS232 cable. If you use other COM port (ex.COM5), please modify the first line of "7188xw.ini".



5. Power off iPAC, switch the dip on the iPAC-8803 to "INIT" position, then power it up.

6. If the connection is Ok, "i-8000>" messages will appear on the 7188xw screen.

```
ICP_DAS MiniOS7 for I-8000 Ver. 2.00 build 002,Apr 08 2005 17:06:02
SRAM:512K, FLASH MEMORY:512K
[CPU=Am188ES]
Serial number= 09 63 4A 60 03 00 00 76

i-8000>
```

7. Type "IP xxx.xxx.xxx.xxx" to set LAN1's IP address. For ex., IP 192.168.1.100 then type "IP" to see the current set IP.

8. Type "IP2 xxx.xxx.xxx.xxx" to set LAN2's IP address. For ex., IP2 192.168.1.101 then type "IP" to see the current set IP.

9. Type "Mask xxx.xxx.xxx.xxx" to set LAN1's Mask address. For ex., Mask 255.255.255.0 then type "Mask" to see the current set Mask.

10. Type "Mask2 xxx.xxx.xxx.xxx" to set LAN2's Mask address. For ex., Mask2 255.255.255.0 then type "Mask2" to see the current set Mask.

If you wish to set the gateway address, you can use the "Gateway xxx.xxx.xxx.xxx" and the "Gateway2 xxx.xxx.xxx.xxx" command.

11. Remember to switch the dip on the iPAC back to "Run" position , recycle the power of the controller.