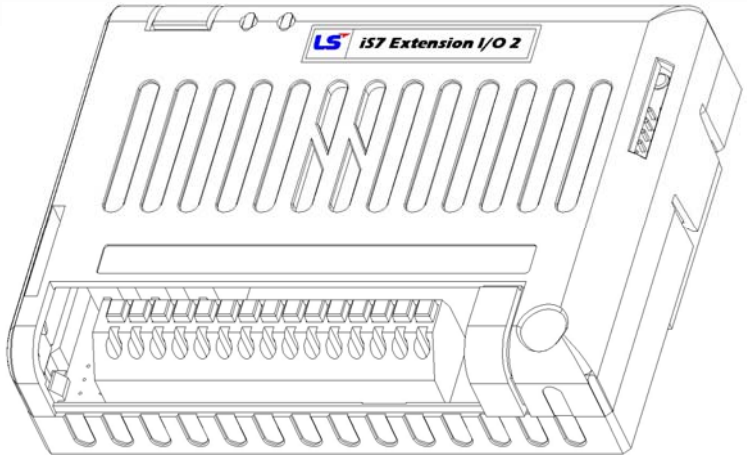
Right choice for ultimate yield

LSIS strives to maximize customers' profit in gratitude of choosing us for your partner.

Extension I/O 2 Option Module

SV-iS7 Series

User Manual



Safety Instructions

- Use this board after read Safety Instruction of this manual carefully before using and follow the instructions exactly.
- Please hand this user manual to end user and trouble shooting manager
- After read this manual, keep it at handy for future reference.

- 사용 전에 '안전상의 주의사항'을 반드시 읽고 정확하게 사용하여 주십시오.
- 본 설명서는 제품을 사용하는 사람이 항상 볼 수 있는 곳에 잘 보관하십시오.

LS Industrial Systems

Safety Precaution

First thank you for using our iS7 Extension I/O 2 Option Board!

Please follow the following safety attentions since they are intended to prevent any possible accident and danger so that you can use this product safely and correctly.

Safety attentions may classify into ‘Warning’ and ‘Caution’ and their meaning is as following:

Symbol	Meaning
 **WARNING**	This symbol indicates the possibility of death or serious injury.
 **CAUTION**	This symbol indicates the possibility of injury or damage to property.

The meaning of each symbol in this manual and on your equipment is as follows.

Symbol	Meaning
	This is the safety alert symbol. Read and follow instructions carefully to avoid dangerous situation.
	This symbol alerts the user to the presence of “dangerous voltage” inside the product that might cause harm or electric shock.

After reading this manual, keep it in the place that the user always can contact. This manual should be given to the person who actually uses the products and is responsible for their maintenance.

WARNING

- **Do not remove the cover while power is applied or the unit is in operation.**
  Otherwise, electric shock could occur.
- **Do not run the inverter with the front cover removed.**

⚠ WARNING

Otherwise, you may get an electric shock due to high voltage terminals or charged capacitor exposure.

- **Do not remove the cover except for periodic inspections or wiring, even if the input power is not applied.**
  Otherwise, you may access the charged circuits and get an electric shock.
- **Wiring and periodic inspections should be performed at least 10 minutes after disconnecting the input power and after checking the DC link voltage is discharged with a meter (below DC 30V).**
  Otherwise, you may get an electric shock.
- **Operate the switches with dry hands.**
  Otherwise, you may get an electric shock.
- **Do not use the cable when its insulating tube is damaged.**
  Otherwise, you may get an electric shock.
- **Do not subject the cables to scratches, excessive stress, heavy loads or pinching.**
  Otherwise, you may get an electric shock.

⚠ CAUTION

- **Install the inverter on a non-flammable surface. Do not place flammable material nearby.**
  Otherwise, fire could occur.
- **Disconnect the input power if the inverter gets damaged.**
  Otherwise, it could result in a secondary accident and fire.
- **Do not touch the inverter while the input power is applied or after removed. It will remain hot for a couple of minutes.**
  Otherwise, you may get bodily injuries such as skin-burn or damage.
- **Do not apply power to a damaged inverter or to an inverter with parts missing even if the installation is complete.**
  Otherwise, electric shock could occur.
- **Do not allow lint, paper, wood chips, dust, metallic chips or other foreign matter into the drive.**
  Otherwise, fire or accident could occur.

Table of Contents

1. Introduction

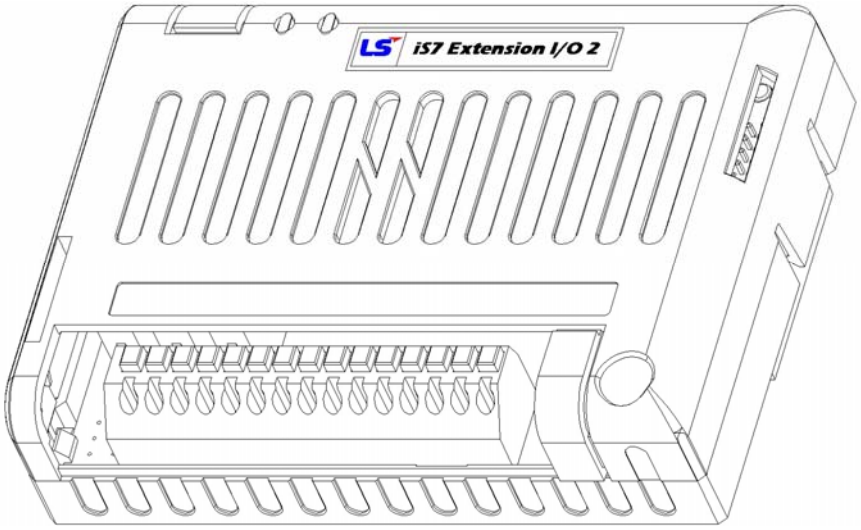
Extension I/O 2 Card is a dedicated option for SV-iS7 Web Inverter expanding the Analog Input Terminal for Analog Input/Output when controlling wire drawing machine and winder.

1.1 Product Composition

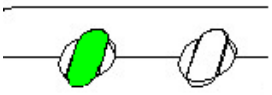
It composes of one Extension I/O 2 Card, one screw and this manual.

1.2 Extension I/O 2 Exterior and Installation

(1) Exterior of Extension I/O 2

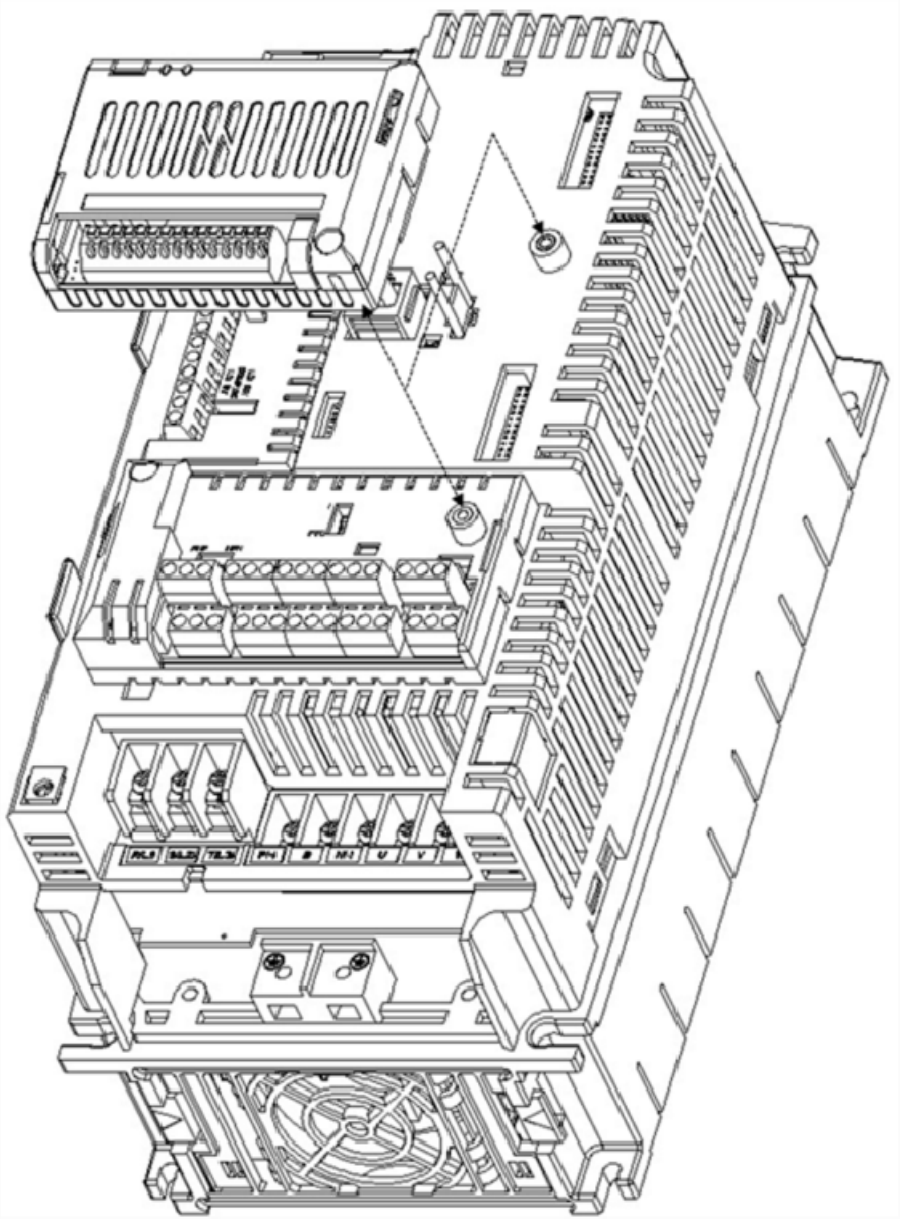


(2) Extension I/O 2 LED Composition



Only left LED is green and displays the state of Extension I/O 2. Right LED is not used.

(3) Tighten Extension I/O 2 to iS7 inverter

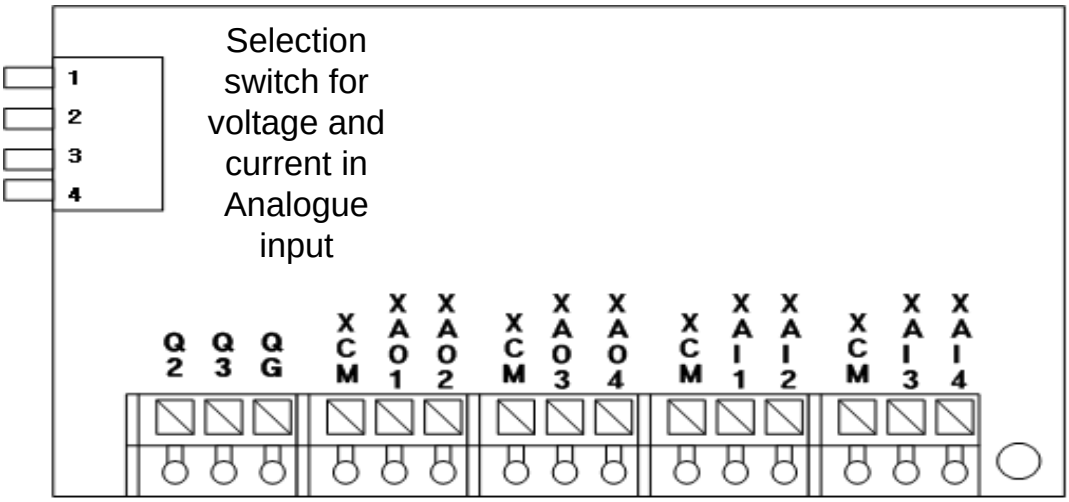


2. Extension I/O 2 Performance

(1) Basic Performance

Item	Description	
Analog Input (4 Channels)	**Voltage**	Input Range: ▪ 10V ~ -10V ▪ 10V ~ 0V Internal Impedance: 22.1kΩ Error Rate: 1% Angular Resolution: 12Bit
	Current	Input Range: 0mA ~ 20mA Internal Impedance: 249Ω Error Rate: 1% (In case of input is 4mA or over) Angular Resolution: 12Bit
Analog Output (4 Channels)	**voltage** (2 Channels)	Output Range: 10V ~ -10V Internal Impedance: 100Ω Maximum Output Current: 10mA Load of External Device: 1KΩ or over Error Rate: 1% Angular Resolution: 12Bit
	Current (2 Channels)	Output Range: 0mA ~ 20mA Internal Impedance: 100Ω Load of External Device: 500Ω or below Error Rate: 1% (In case of output is 4mA or over) Angular Resolution: 12Bit
Digital Output (2 Channels)	Transistor Output(Maximum 26V, 100mA)	

(2) I/O Terminal Block Standard



Function	Terminal Block Name	Standard	
Analog Input	**XAI1 XAI2 XAI3 XAI4**	voltage	Input Range: 10V ~ -10V Internal Impedance: 22.1kΩ
		Current	Input Range: 0 ~ 20mA Internal Impedance: 249Ω
Analog Output	**XAO1 XAO3**	Output Range: 10V ~ -10V Maximum Current Output: 10mA Internal Impedance: 100Ω	
	XAO2 XAO4	Output Range: 0mA ~ 20mA Internal Impedance: 100Ω	
Digital Output	**Q2 Q3**	Transistor Output Voltage : 26V Current : 100mA	
Digital Output Ground	**QG**	When ON Signal is shown in Output Terminal Block, continuity is formed between QxTerminal and QG. (Signal such as XCM)	
Analog Ground	**XCM**	Analog Signal Ground of Ext IO2 different from inverter CM.	

3. Extension I/O 2 Option and Relevant Keypad parameter

The parameter list contains inverter parameters showing information related to Extension I/O 2.

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
CNF-30	X	Option-1 Type	Option slot 1 Type Mark	Ext IO2		Ext IO2	X
CNF-31	X	Option-2 Type	Option slot 2 Type Mark	Ext IO2		Ext IO2	X
DRV-07	0h1107	Freq Ref Src	How to set frequency	0	Keypad-1	0:Keypad-1	X
DRV-08	0h1108	Trq Ref Src	How to command torque	1	Keypad-2	0:Keypad-1	X
BAS-05	0h1205	Freq 2nd Src	How to set the 2nd frequency	2	V1	0:Keypad-1	O
BAS-06	0h1206	Trq 2nd Src	How to command the 2nd torque	3	I1	0:Keypad-1	O
CON-53	0h1435	Torque Lmt Src	How to set torque limit	4	V2	0:Keypad-1	O
				5	I2		
				6	Int 485		
				7	Encoder		
				8	Field Bus		
				9	PLC		
				10	Synchro		
				11	Binary Type		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				12	XV1		
				13	XI1		
				14	XV2		
				15	XI2		
				16	XV3		
				17	XI3		
				18	XV4		
				19	XI4		
CON-58	0h143A	Trq Bias Src	How to set torque Bias	0	Keypad-1	0:Keypad-1	O
CON-62	0h143D	Speed Lmt Src	How to set Speed limit	1	Keypad-2	0:Keypad-1	O
				2	V1		
				3	I1		
				4	V2		
				5	I2		
				6	Int 485		
				7	Field Bus		
				8	PLC		
				9	XV1		
				10	XI1		
				11	XV2		
				12	XI2		
				13	XV3		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				14	XI3		
				15	XV4		
				16	XI4		
IN-01	0h1501	Freq at 100%	Frequency when inputting the maximum analog	Initial frequency ~Maximum frequency[Hz]		60.00	O
IN-02	0h1502	Torque at100%	Torque when inputting the maximum analog	0~200[%]		100.0	O
OUT-37	0h1622	Q2 Define	Multi-Function Output 2 Item	0	NONE	5: Over Load	O
OUT-38	0h1623	Q3 Define	Multi-Function Output 3 Item	1	FDT-1	6: IOL	O
				2	FDT-2		
				3	FDT-3		
				4	FDT-4		
				5	Over Load		
				6	IOL		
				7	Under Load		
				8	Fan Warning		
				9	Stall		
				10	Over Voltage		
				11	Low Voltage		
				12	Over Heat		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				13	Lost Command		
				14	Run		
				15	Stop		
				16	Steady		
				17	Inverter Line		
				18	Comm Line		
				19	Speed Search		
				20	Step Pulse		
				21	Seq Pulse		
				22	Ready		
				23	Trv Acc		
				24	Trv Dec		
				25	MMC		
				26	Zspd Dect		
				27	Torque Dect		
				28	Timer Out		
				29	Trip		
				30	Lost Keypad		
				31	DB Warn%ED		
				32	ENC Tune		
				33	ENC Dir		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				34	On/Off Control		
				35	BR Control		
				36	Web Break		
OUT-50	0h1632	DO On Delay	Multi-Function Output On Delay	0~100[sec]		0.00	O
OUT-51	0h1633	DO Off Delay	Multi-Function Output Off Delay	0~100[sec]		0.00	O
APP-05	0h1805	Main Spd Src	Select how to command main speed	0	Keypad	1:V1	X
APP-20 [1)]	0h1814	PID Ref Source	SELECT PID REFERENCE	1	V1	0: Keypad	X
				2	I1		
				3	V2		
				4	I2		
				5	Int 485		
				6	Encoder		
				7	FieldBus		
				8	PLC		
				9	Synchro		
				10	Binary Type		
				11	XV1		

[1] APP 20~21Code will appear only when APP-01(App Mode) is set as “Proc PID” or “MMC” and Regul Bypass(APO-34) is set to “No”.

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				12	XI1		
				13	XV2		
				14	XI2		
				15	XV3		
				16	XI3		
				17	XV4		
				18	XI4		
APP-21	0h1815	PID F/B Source	Select PID Feedback	0	V1	1:I1	X
				1	I1		
				2	V2		
				3	I2		
				4	Int 485		
				5	Encoder		
				6	FieldBus		
				7	PLC		
				8	Synchro		
				9	Binary Type		
				10	XV1		
				11	XI1		
				12	XV2		
				13	XI2		
				14	XV3		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				15	XI3		
				16	XV4		
				17	XI4		
XAO-1	0h1D01	XAO1 Mode	XAnalog Output1 Item	0	Frequency	0: Frequency	O
				1	Output Current		
				2	Output Voltage		
				3	DCLink Voltage		
				4	Torque		
				5	Output Power		
				6	Idse		
				7	Iqse		
				8	Target Freq		
				9	Ramp Freq		
				10	Speed Fdb		
				11	Speed Dev		
				12	PID Ref Value		
				13	PID Fdb Value		
				14	PID Output		
				15	Constant		
				16	Web Spd Out		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
XAO-2	0h1D02	XAO1 Gain	XAnalog Output1 Gain	-1000.0~ 1000.0[%]		100.0	O
XAO-3	0h1D03	XAO1 Bias	XAnalogOutput1 Bias	-100.0~ 100.0[%]		0.0	O
XAO-4	0h1D04	XAO1 Filter	XAnalog Output1 Filter	0~10000[msec]		5	O
XAO-5	0h1D05	XAO1 Const %	XAnalog Constant Output1	-100.0~ 100.0[%]		0.0	O
XAO-6	0h1D06	XAO1 Monitor	XAnalog Output1 Monitor	-1000.0~ 1000.0[%]		0.0	X
XAO-7	0h1D07	XAO2 Mode	XAnalog Output2 Item	0	Frequency	0: Frequency	O
				1	Output Current		
				2	Output Voltage		
				3	DCLink Voltage		
				4	Torque		
				5	Output Power		
				6	Idse		
				7	Iqse		
				8	Target Freq		
				9	Ramp Freq		
				10	Speed Fdb		
				11	Speed Dev		
				12	PID Ref Value		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				13	PID Fdb Value		
				14	PID Output		
				15	Constant		
				16	Web Spd Out		
XAO-8	0h1D08	XAO2 Gain	XAnalog Output2 Gain	-1000.0~ 1000.0[%]		100.0	O
XAO-9	0h1D09	XAO2 Bias	XAnalogOutput2 Bias	-100.0~ 100.0[%]		0.0	O
XAO-10	0h1D0A	XAO2 Filter	XAnalog Output2 Filter	0~10000[msec]		5	O
XAO-11	0h1D0B	XAO2 Const %	XAnalog Constant Output2	0.0~100.0[%]		0.0	O
XAO-12	0h1D0C	XAO2 Monitor	XAnalogOutput2Monitor	0.0~1000.0[%]		0.0	X
XAO-13	0h1D0D	XAO3 Mode	XAnalog Output3 Item	0	Frequency	0: Frequency	O
				1	Output Current		
				2	Output Voltage		
				3	DCLink Voltage		
				4	Torque		
				5	Output Power		
				6	Idse		
				7	Iqse		
				8	Target Freq		
				9	Ramp		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
					Freq		
				10	Speed Fdb		
				11	Speed Dev		
				12	PID Ref Value		
				13	PID Fdb Value		
				14	PID Output		
				15	Constant		
				16	Web Spd Out		
XAO-14	0h1D0E	XAO3 Gain	XAnalog Output3 Gain	-1000.0~ 1000.0[%]		100.0	O
XAO-15	0h1D0F	XAO3 Bias	XAnalog Output3 Bias	-100.0~ 100.0[%]		0.0	O
XAO-16	0h1D10	XAO3 Filter	XAnalog Output3 Filter	0~10000[msec]		5	O
XAO-17	0h1D11	XAO3 Const %	XAnalog Constant Output3	-100.0~ 100.0[%]		0.0	O
XAO-18	0h1D12	XAO3 Monitor	XAnalogOutput3Monitor	-1000.0~ 1000.0[%]		0.0	X
XAO-19	0h1D13	XAO4 Mode	XAnalog Output4 Item	0	Frequency	0: Frequency	O
				1	Output Current		
				2	Output Voltage		
				3	DCLink Voltage		
				4	Torque		
				5	Output Power		

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				6	Idse		
				7	Iqse		
				8	Target Freq		
				9	Ramp Freq		
				10	Speed Fdb		
				11	Speed Dev		
				12	PID Ref Value		
				13	PID Fdb Value		
				14	PID Output		
				15	Constant		
				16	Web Spd Out		
XAO-20	0h1D14	XAO4 Gain	XAnalog Output4 Gain	-1000.0~ 1000.0[%]		100.0	O
XAO-21	0h1D15	XAO4 Bias	XAnalogOutput4 Bias	-100.0~ 100.0[%]		0.0	O
XAO-22	0h1D16	XAO4 Filter	XAnalog Output4 Filter	0~10000[msec]		5	O
XAO-23	0h1D17	XAO4 Const %	XAnalog Constant Output4	0.0~100.0[%]		0.0	O
XAO-24	0h1D18	XAO4 Monitor	XAnalogOutput4Monitor	0.0~1000.0[%]		0.0	X
XAI-1	0h1E01	XAI1 Input Type	Set input type of xAnalog Input 1	0	Volt_Unipolar	1:Volt_Bipolar	X
				1	Volt_Bipolar		
				2	Current		

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAI-2 [2]	0h1E02	XV1Monitor[V]	Display input quantity of XV1	-10~10.00[V]	-	X
XAI-3	0h1E03	XV1 Filter	Time constant of XV1 Input Filter	0~10000[msec]	10	O
XAI-4	0h1E04	XV1 Volt x1	XV1Input the Minimum Voltage	0.00~10.00[V]	0.00	O
XAI-5	0h1E05	XV1 Perc y1	Output% when it is in the minimum voltage of XV1	0.00~100.00[%]	0.00	O
XAI-6	0h1E06	XV1 Volt x2	XV1Maximum Input voltage	0.00~10.00[V]	10.00	O
XAI-7	0h1E07	XV1 Perc y2	Output% when it is in the maximum voltage of XV1	0.00~100.00[%]	100.00	O
XAI-8 [3]	0h1E08	XV1 –Volt x1’	XV1–Input the Minimum Voltage	-10.00~0.00[V]	0.00	O

[2] XAI-2~7 Code will appear when the value of XAI-1 as Volt_Unipolar or Volt_Bipolar.
[3] XAI-8~13 Code will appear when the value of XAI-1 as Volt_Bipolar.

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAI-9	0h1E09	XV1 –Perc y1’	Output% when it is in the minimum voltage ofXV1	-100.00~ 0.00[%]	0.00	O
XAI-10	0h1E0A	XV1 –Volt x2’	XV1– Maximum Input voltage	-10.00~0.00[V]	-10.00	O
XAI-11	0h1E0B	XV1 –Perc y2’	Output% when it is in the maximum voltage of XV1	-100.00~ 0.00[%]	-100.00	O
XAI-12	0h1E0C	XV1 Inverting	Change rotation directions of XV1	0 No 1 Yes	0: No	O
XAI-13	0h1E0D	XV1 Quantizing	XV1 Quantizing Level	0.04~10[%]	0.04	O
XAI-14 [4]	0h1E0E	XI1Monito r[mA]	Display input quantity of XI1	0~20[mA]	0.00	O
XAI-15	0h1E0F	XI1 Filter	Time constant of XI1 input filter	0 ~10000[msec]	10	O

[4] XAI-14~21 Code will appear when the value of XAI-1 as Current.

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
XAI-16	0h1E10	XI1 Curr x1	XI1 Minimum Input Current	0~20[mA]		4.00	O
XAI-17	0h1E11	XI1 Perc y1	Output% when it is in the minimum current of XI1	0~100[%]		0.00	O
XAI-18	0h1E12	XI1 Curr x2	XI1Maximum Input Current	0~20[mA]		20.00	O
XAI-19	0h1E13	XI1 Perc y2	Output% when it is in the maximum current of XI1	0~100[%]		100.00	O
XAI-20	0h1E14	XI1 Inverting	Change rotation directions of XI1	0	No	0: No	O
				1	Yes		
XAI-21	0h1E15	XI1 Quantizing	XI1 Quantizing Level	0.04~10[%]		0.04	O
XAI-22	0h1E16	XAI2Input Type	Set input type of xAnalog Input 2	0	Volt_Unipolar	1:Volt_Bipolar	X
				1	Volt_Bipolar		
				2	Current		

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAI-23 [5]	0h1E17	XV2Monitor[V]	Display input quantity of XV2	-10~10.00[V]	-	X
XAI-24	0h1E18	XV2 Filter	Time constant of XV2 Input Filter	0~10000[msec]	10	O
XAI-25	0h1E19	XV2 Volt x1	XV2Input the Minimum Voltage	0.00~10.00[V]	0.00	O
XAI-26	0h1E1A	XV2 Perc y1	Output% when it is in the minimum voltage of XV2	0.00~100.00[%]	0.00	O
XAI-27	0h1E1B	XV2 Volt x2	XV2Maximum Input voltage	0.00~10.00[V]	10.00	O
XAI-28	0h1E1C	XV2 Perc y2	XV2Maximum voltage Output%	0.00~100.00[%]	100.00	O
XAI-29 [6]	0h1E1D	XV2 –Volt x1’	XV2–Input the minimum voltage	-10.00~0.00[V]	0.00	O

[5] XAI-23~28 Code will appear when the value of XAI-22 as Volt_Unipolar or Volt_Bipolar.
[6] XAI-29~34 Code will appear when the value of XAI-22 as Volt_Bipolar.

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
XAI-30	0h1E1E	XV2 –Perc y1’	XV2–Output% when it is in the minimum voltage of XV2	-100.00~ 0.00[%]		0.00	O
XAI-31	0h1E1F	XV2 –Volt x2’	XV2–Input the Maximum Voltage	-10.00~0.00[V]		-10.00	O
XAI-32	0h1E20	XV2 –Perc y2’	Output% when it is in the maximum voltage of XV2	-100.00~ 0.00[%]		-100.00	O
XAI-33	0h1E21	XV2 Inverting	Change rotation directions of XV2	0	No	0: No	O
				1	Yes		
XAI-34	0h1E22	XV2 Quantizing	XV2 Quantizing Level	0.04~10[%]		0.04	O
XAI-35 [7]	0h1E23	XI2Monito r[mA]	Display input quantity of XI2	0~20[mA]		0.00	O
XAI-36	0h1E24	XI2 Filter	Time constant of XI2 Input Filter	0 ~10000[msec]		10	O

[7] XAI-35~43 Code will appear when the value of XAI-22 as Current.

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
XAI-37	0h1E25	XI2 Curr x1	XI2 Minimum Input Current	0~20[mA]		4.00	O
XAI-38	0h1E26	XI2 Perc y1	Output% when it is in the minimum current of XI2	0~100[%]		0.00	O
XAI-39	0h1E27	XI2 Curr x2	XI2Maximum Input Current	0~20[mA]		20.00	O
XAI-40	0h1E28	XI2 Perc y2	Output% when it is in the maximum current of XI2	0~100[%]		100.00	O
XAI-41	0h1E29	XI2 Inverting	Change rotation directions of XI2	0	No	0: No	O
				1	Yes		
XAI-42	0h1E2A	XI2 Quantizing	XI2 Quantizing Level	0.04~10[%]		0.04	O
XAI-43	0h1E2B	XAI3Input Type	Set input type of xAnalog Input 3	0	Volt_Unipolar	1:Volt_Bipolar	X
				1	Volt_Bipolar		
				2	Current		

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAI-44 [8]	0h1E2C	XV3Monitor[V]	Display input quantity of XV3	-10~10.00[V]	-	X
XAI-45	0h1E2D	XV3 Filter	Time constant of XV3 Input Filter	0~10000[msec]	10	O
XAI-46	0h1E2E	XV3 Volt x1	XV3-Input the Minimum Voltage	0.00~10.00[V]	0.00	O
XAI-47	0h1E2F	XV3 Perc y1	Output% when it is in the minimum voltage of XV3	0.00~100.00[%]	0.00	O
XAI-48	0h1E30	XV3 Volt x2	XV3Maximum Input voltage	0.00~10.00[V]	10.00	O
XAI-49	0h1E31	XV3 Perc y2	Output% when it is in the maximum voltage of XV3	0.00~100.00[%]	100.00	O
XAI-50 [9]	0h1E32	XV3 –Volt x1’	XV3–Input the Minimum Voltage	-10.00~0.00[V]	0.00	O

[8] XAI-44~49 Code will appear when the value of XAI-43 as Volt_Unipolar or Volt_Bipolar.
[9] XAI-50~55 Code will appear when the value of XAI-43 as Volt_Bipolar.

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAI-51	0h1E33	XV3 –Percy1’	Output% when it is in the minimum voltage of XV3	-100.00~ 0.00[%]	0.00	O
XAI-52	0h1E34	XV3 –Volt x2’	XV3– Maximum Input voltage	-10.00~ 0.00[V]	-10.00	O
XAI-53	0h1E35	XV3 –Perc y2’	Output% when it is in the maximum voltage of XV3	-100.00~ 0.00[%]	-100.00	O
XAI-54	0h1E36	XV3 Inverting	Change rotation directions of XV3	0 No 1 Yes	0: No	O
XAI-55	0h1E37	XV3 Quantizing	XV3 Quantizing Level	0.04~10[%]	0.04	O
XAI-56 [10]	0h1E38	XI3Monitor[mA]	Display input quantity of XI3	0~20[mA]	0.00	O
XAI-57	0h1E39	XI3 Filter	Time constant of XI3 Input Filter	0 ~10000[msec]	10	O

[10] AI-56~63 Code will appear when the value of XAI-43 as Current.

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
XAI-58	0h1E3A	XI3 Curr x1	XI3 Minimum Input Current	0~20[mA]		4.00	O
XAI-59	0h1E3B	XI3 Perc y1	Output% when it is in the minimum current of XI3	0~100[%]		0.00	O
XAI-60	0h1E3C	XI3 Curr x2	XI3Maximum Input Current	0~20[mA]		20.00	O
XAI-61	0h1E3D	XI3 Perc y2	Output% when it is in the maximum current of XI3	0~100[%]		100.00	O
XAI-62	0h1E3E	XI3 Inverting	Change rotation directions of XI3	0	No	0: No	O
				1	Yes		
XAI-63	0h1E3F	XI3 Quantizing	XI3 Quantizing Level	0.04~10[%]		0.04	O
XAI-64	0h1E40	XAI4Input Type	Set input type of xAnalog Input 4	0	Volt_Unipolar	1:Volt_Bipolar	X
				1	Volt_Bipolar		
				2	Current		

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAI-65 [11]	0h1E41	XV4Monitor[V]	Display input quantity of XV4	-10~10.00[V]	-	X
XAI-66	0h1E42	XV4 Filter	Time constant of XV4 Input Filter	0~10000[msec]	10	O
XAI-67	0h1E43	XV4 Volt x1	XV4Input the Minimum Voltage	0.00~10.00[V]	0.00	O
XAI-68	0h1E44	XV4 Perc y1	Output% when it is in the minimum voltage of XVA	0.00~100.00[%]	0.00	O
XAI-69	0h1E45	XV4 Volt x2	XV4Maximum Input voltage	0.00~10.00[V]	10.00	O
XAI-70	0h1E46	XV4 Perc y2	Output% when it is in the maximum voltage of XV4	0.00~100.00[%]	100.00	O
XAI-71 [12]	0h1E47	XV4 –Volt x1’	XV4–Input the Minimum Voltage	-10.00~0.00[V]	0.00	O

[11] XAI-65~70 Code will appear XAI-64 as Volt_Unipolar or Volt_Bipolar.
[12] XAI-71~76 Code will appear when the value of XAI-64 as Volt_Bipolar.

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
XAI-72	0h1E48	XV4 –Perc y1’	Output% when it is in the minimum voltage of XV4	-100.00 ~0.00[%]		0.00	O
XAI-73	0h1E49	XV4 –Volt x2’	XV4– Maximum Input voltage	-10.00~0.00[V]		-10.00	O
XAI-74	0h1E4A	XV4 –Perc y2’	Output% when it is in the maximum voltage of XV4	-100.00 ~0.00[%]		-100.00	O
XAI-75	0h1E4B	XV4 Inverting	Change rotation directions of XV4	0	No	0: No	O
				1	Yes		
XAI-76	0h1E4C	XV4 Quantizing	XV4 Quantizing Level	0.04~10[%]		0.04	O
XAI-77 [13]	0h1E4D	XI4Monito r[mA]	Display input quantity of XI4	0~20[mA]		0.00	O
XAI-78	0h1E4E	XI4 Filter	Time constant of XI4 Input Filter	0 ~10000[msec]		10	O

[13] XAI-77~84 Code will appear when the value of XAI-64 as Current.

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAI-79	0h1E4F	XI4 Curr x1	XI4 Minimum Input Current	0~20[mA]	4.00	O
XAI-80	0h1E50	XI4 Perc y1	Output% when it is in the minimum current of XI4	0~100[%]	0.00	O
XAI-81	0h1E51	XI4 Curr x2	XI4 Maximum Input Current	0~20[mA]	20.00	O
XAI-82	0h1E52	XI4 Perc y2	Output% when it is in the maximum current of XI4	0~100[%]	100.00	O
XAI-83	0h1E53	XI4 Inverting	Change rotation directions of XI4	0 No 1 Yes	0: No	O
XAI-84	0h1E54	XI4 Quantizing	XI4 Quantizing Level	0.04~10[%]	0.04	O
XAC-8	X	XAI Adjust CH	Select Input Terminal Channel to be connected to XAI	1 ~ 4 (Channel Number)	1	X
XAC-9	X	CalcXAI Adjust	Select voltage and current inputted to XAI	0 None 1 0 Volt	0: None	X

No	Address for Comm.	Function Mark	Name	Setting Range		Initial Value	Change during Operating
				2	10 Volt		
				3	-10 Volt		
				4	0 mA		
				5	20 mA		
XAC-10 [14]	0h1F0A	XV1 0V Perc	Correction% in case of XV1 0V	-20.00~20.00 [%]		-1.99[%]	X
XAC-11	0h1F0B	XV1 10V Perc	Correction% in case of XV1 10V	80.00~100.00 [%]		88.92[%]	X
XAC-12 [15]	0h1F0C	XV1 -10V Perc	Correction% in case of XV1 -10V	-100.00~-80.00 [%]		-92.91[%]	X
XAC-13 [16]	0h1F0D	XI1 0mA Prec	Correction% in case of XI1 0mA	0.00~40.00 [%]		5.64[%]	X
XAC-14	0h1F0E	XI1 20mA Perc	Correction% in case of XI1 20mA	80.00~100.00 [%]		93.98[%]	X

[14] XAC-10~1 Code will appear when the value of XAI-1 as Volt_Unipolar or Volt_Bipolar.
[15] XAC-12 Code will appear when the value of XAI-1 as Volt_Bipolar.
[16] XAC-13~14 Codewill appear when the value of XAI-1 as Current.

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAC-20 [17]	0h1F14	XV2 0V Perc	Correction% in case of XV1 0V	-20.00~20.00 [%]	-01.92[%]	X
XAC-21	0h1F15	XV2 10V Perc	Correction% in case of XV1 10V	80.00~100.00 [%]	88.87[%]	X
XAC-22 [18]	0h1F16	XV2 -10V Perc	Correction% in case of XV1 -10V	-100.00~-80.00 [%]	-92.76[%]	X
XAC-23 [19]	0h1F17	XI2 0mA Prec	Correction% in case of XI1 0mA	0.00~40.00 [%]	5.49[%]	X
XAC-24	0h1F18	XI2 20mA Perc	Correction% in case of XI1 20mA	80.00~100.00 [%]	94.24[%]	X
XAC-30 [20]	0h1F1E	XV3 0V Perc	Correction% in case of XV1 0V	-20.00~20.00 [%]	-2.30[%]	X

[17] XAC-20~21Codewill appear when the value of XAI-22 as Volt_Unipolar or Volt_Bipolar.
[18] XAC-22 Code will appear when the value of XAI-22 as Volt_Bipolar.
[19] XAC-23~24 Code will appear when the value of XAI-22 as Current.
[20] XAC-30~31 Code will appear when the value of XAI-43 as Volt_Unipolar or Volt_Bipolar.

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAC-31	0h1F1F	XV3 10V Perc	Correction% in case of XV1 10V	80.00~100.00 [%]	89.00[%]	X
XAC-32 21)	0h1F20	XV3 -10V Perc	Correction% in case of XV1 -10V	-100.00~-80.00 [%]	-93.62[%]	X
XAC-33 22)	0h1F21	XI3 0mA Prec	Correction% in case of XI3 0mA	0.00~40.00 [%]	5.27[%]	X
XAC-34	0h1F22	XI3 20mA Perc	Correction% in case of XI3 20mA	80.00~100.00 [%]	94.22[%]	X
XAC-40 23)	0h1F28	XV4 0V Perc	Correction% in case of XV4 0V	-20.00~20.00 [%]	-2.23[%]	X
XAC-41	0h1F29	XV4 10V Perc	Correction% in case of XV4 10V	80.00~100.00 [%]	88.84[%]	X

[21] XAC-32 Code will appear when the value of XAI-43 is selected as Volt_Bipolar.
[22] XAC-33~34 Code will appear when the value of XAI-43 is selected as Current.
[23] XAC-40~41 Code will appear when the value of XAI-64 as Volt_Unipolar or Volt_Bipolar

No	Address for Comm.	Function Mark	Name	Setting Range	Initial Value	Change during Operating
XAC-42 [24]	0h1F2A	XV4 -10V Perc	Correction% in case of XV4 -10V	-100.00~-80.00 [%]	-93.30[%]	X
XAC-43 [25]	0h1F2B	XI4 0mA Prec	Correction% in case of XI4 0mA	0.00~40.00 [%]	5.19[%]	X
XAC-44	0h1F2C	XI4 20mA Perc	Correction% in case of XI4 20mA	80.00~100.00 [%]	94.00[%]	X

[24] XAC-42 Code will appear when the value of XAI-64 as Volt_Bipolar.
[25] XAC-43~44 Code will appear when the value of XAI-64 as Current.

4. Digital Output (Q2, Q3)

Refer to Chapter 9: Monitor Function “9.1.4 Selection of relay function and multi-function output terminal of terminal block”. Because output is Transistor, shot may cause failure to the terminal block and it does not run. Carefully tighten the terminal.

5. Analog Output (XAOx Terminal)

5.1 Analog Output Setting Parameter (XAI Group)

Set XAO Group's parameters.

Function Mark	Initial Setting Mark		Unit
XAOx Mode	0	Frequency	-
XAOx Gain	-	100.0	%
XAOx Bias	-	0.0	%
XAOx Filter	-	5	Msec
XAOx Const %	-	0.0	%
XAOx Monitor	-	0.0	%

(Small letter 'x' is the terminal number of Analog Output ranged 1 through 4.)

XAO1 Mode: Select a type of the Output Item.

Setting Item		Function
0	Frequency	Operating frequency is outputted. The maximum output is generated in the frequency set in DRV-20 Max Freq.
1	Output Current	The maximum output is generated in 200% of the inverter's rated current (CT: Based on Constant Torque).
2	Output Voltage	The inverter's output voltage is outputted. 10V is outputted in the voltage set in BAS-15 Rated Volt. In case that 0V is set in BAS-15, In maximum 220V is outputted for Class 200V while 440V is outputted for Class 400V.
3	DC Link Volt	Inverter's DC Power voltage is outputted. Its maximum output is generated when it is 410V DC for Class 200V inverter and it is 820V DC for Class 400V.
4	Torque	Generation Torque is outputted. The maximum output is generated in 250% of Motor Rated Torque.
5	Output Power	Output watt is monitored. In maximum 200% of Rated Output is output.
6	Idse	In maximum 200% of non-load current is outputted(100% Output).

Setting Item		Function
7	Iqse	The maximum voltage is outputted in 250% of Rated Torque Current. $Rated\ Torque\ Current = \sqrt{Rated\ Current^2 - Non-load\ Current^2}$
8	Target Freq	Setting frequency is outputted. 100% is outputted in DRV-20 maximum frequency.
9	Ramp Freq	Frequency that has get through the acceleration and decelerating function. It may vary from actual output frequency. 100% is outputted.
10	Speed Fdb	Speed information is displayed, which is inputted to the Encoder option card. 100% is inputted in its maximum frequency (DRV-20).
11	Speed Dev	The deviation from the motor rotation Speed inputted to the Speed reference (command) and Encoder option card is outputted. 100% is outputted in twice of rated slip frequency. It is effective only in the vector control mode.
12	PID Ref Value	The PID controller's command value is outputted. When it is 100%, about 66% is outputted.
13	PID Fdk Value	The PID controller's feedback amount is displayed. When it is 100%, about 66% is outputted.
14	PID Output	It displays output value of the PID controller. When it is 100%, 100% is outputted.
15	Constant	It outputs XAOx Const % value.
16	Web Spd Out	It outputs Web's drum speed.

(About 10V is outputted in case that it is of voltage type such as XAO1 or XAO3 for the maximum output or 100% output. About 20mA is outputted in case that it is of current output such as XAO2,XAO4.)

XAOx Gain, XAOx Bias: Size and offset can be adjusted. It moves as following when frequency is selected for output item.

$$XAOx = \frac{Frequency}{MaxFreq} \times XAOxGain + XAOxBias$$

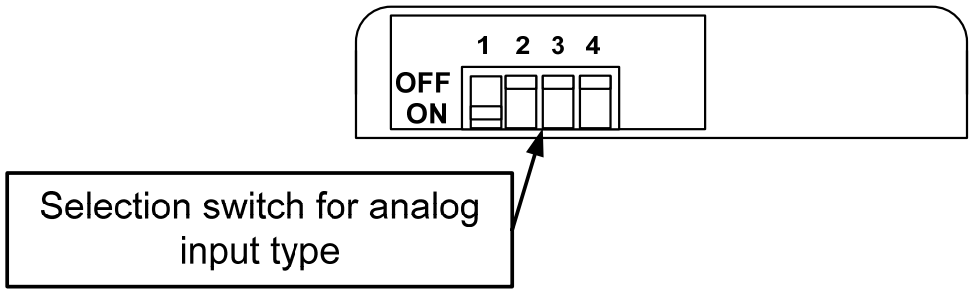
XAOx Filter: Set time constant of analog Output Filter.

6. Set Analog Input Type (XAIx Terminal)

Switch State	Analog Input Terminal Setting(XAIx)
OFF (Switch is not pressed down.)	voltage Input (XAVx)
ON (Switch is pressed down.)	Current Input (XAIx)

(Small letter x refers to the number of a terminal block (1~4))

Side View of Extension IO



Terminal Block Name	Setting Parameter Name
XAI1	XAI-1 XAI1 Input Type
XAI2	XAI-22 XAI2 Input Type
XAI3	XAI-43 XAI3 Input Type
XAI4	XAI-64 XAI4 Input Type

First select an input type of the terminal block to be used by using switch then, select the terminal block type from the inverter's parameters.

In case of voltage, turn the applicable switch OFF and select Volt_Unipolar(0~10V) or Volt_Bipolar(-10~10V) depending on their input voltage range from XAIx Input Type.

In case of current, turn the applicable switch ON and select Current from XAIx Input Type. If SwitchState and terminal block Type are different from each other, it may be available to measure their

accurate values and any loss or damage to the Extension I/O 2 and voltage or current output devices may take place. .

It is possible to select the sources only that fit to selected input type using Extension I/O 2's input as its source. For example, if the user wants to use the Extension I/O 2's first voltage input terminal as its Freq Ref Source, remain the first applicable input type selection switch Off(voltage) and set Volt_Bipolar or Volt_Unipolar for XAI1 Input Type. Set Freq Ref Src for XV1. In this case, it is impossible to set Freq Ref Src for XI1 because voltage is set to input type.

The following is about the case that the user wants to convert Analog Input Terminals (voltage → Current).

For example, if the user wants to use Freq Ref Src by converting Extension I/O 2's first Analog Input Terminal from voltage usage to current usage, the remain the first applicable input type selection switch On(Current) and change Freq Ref Src to values other than XV1 or XI1. If it is done like that, it is possible to set XAI1 Input Type to Current. After setting XAI1 Input Type to Current, frequency command may be possible by using Current if Freq Ref Src is set to XI1.

7. Analog Input (XAI Group)

7.1 Parameters that use Extension I/O 2 Inputs as Sources

No.	Function Mark	Name
DRV-07	Freq Ref Src	How to set frequency
DRV-08	Trq Ref Src	How to command Torque
BAS-05	Freq 2nd Src	How to set the 2nd frequency
BAS-06	Trq 2nd Src	How to command the 2nd Torque
CON-53	Torque Lmt Src	How to set torque limit
CON-58	Trq Bias Src	How to set torque bias
CON-62	Speed Lmt Src	How to set Speed limit
APP-05	Main Spd Src	Select how to command main speed
APP-20	PID Ref Source	Select PID Reference
APP-21	PID F/B Source	Select PID Feedback

Data converted voltage or current input value to percent can be used as sources by the parameters above. Description on how to determine Data(%) is presented as following.

7.2 Volt_Unipolar

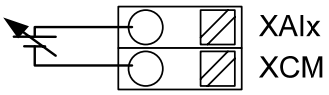
Volt_Unipolar is set from XAIx Input Type in case that XAIx's Input ranges from voltage 0 to 10V. At this time, the following parameters are seen in XAI Group. Parameters displayed if Volt_Unipolar is set from XAIx Input Type.

Function Mark	Setting Mark		Setting Range	Unit
XAIxInput Type	0	Volt_Unipolar	-	-
XVxMonitor[V]	-	0.00	0~10	V
XVx Filter	-	10	0~10000	msec

Function Mark	Setting Mark		Setting Range	Unit
XVx Volt x1	-	0.00	0~10	V
XVx Perc y1	-	0.00	0~100	%
XVx Volt x2	-	10.00	0~10	V
XVx Perc y2	-	100.00	0~100	%
XVx Inverting	-	No	No/Yes	-
XVx Quantizing	-	0.04	0.04~10	%

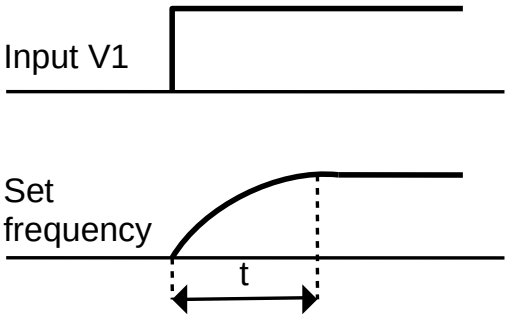
(Other XVx or Xix parameters are processed to be hidden.)

Connect with each other by using external controller's voltage output as seen in the figure.

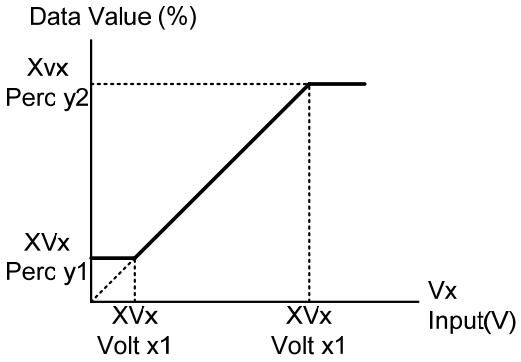


XVxMonitor[V] : It shows the size of the voltage inputted to XAIx Terminal. It is used when monitoring the size of the voltage currently inputted.

XVx Filter : It is used when any significant change in frequency setting values takes place due to surrounding noise environment. Even though the change in frequency may be mitigated if filter time constant is set to a bigger number, response becomes slower. As time constant is set bigger, Time t becomes longer. The set time means the time it takes for the set frequency to increase by about 63% inside the inverter when voltage is inputted as following steps.



XVx Volt x1~ XVx Perc y2: voltage % data gradient and offset value against the size of input voltage can be set.

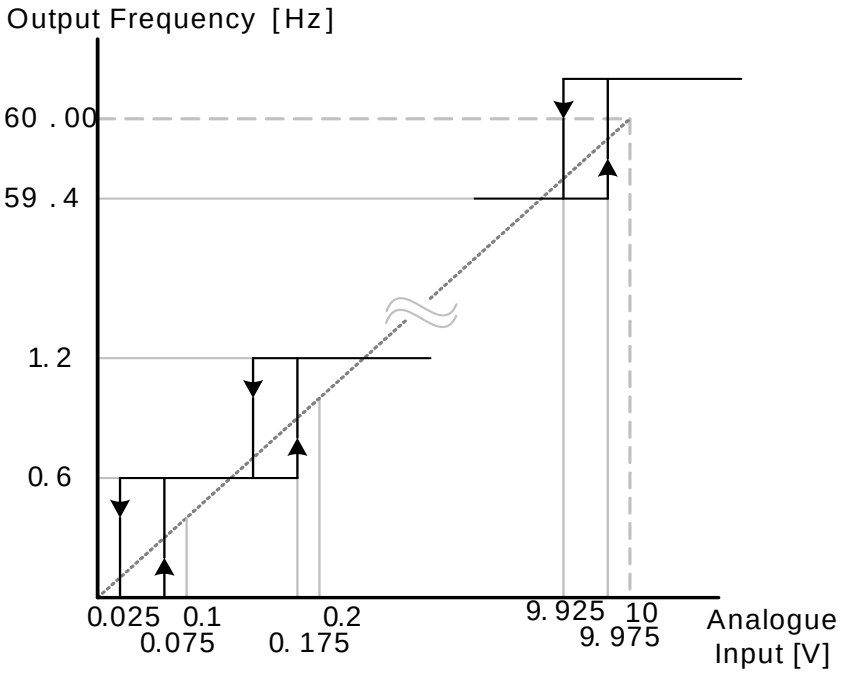


XVx Inverting: If Yes is set one time, multiplicative inverse of Data(%) becomes Input Data(%).

XVx Quantizing: It can be used in case that there are much noise in the Analog Signal inputted to XVIx Terminal. Even though XVx Filter's low-pass value is used to reduce noise a certain amount, but its response becomes slower and also a long interval of ripple may be produced even under output frequency.

Output frequency's angular resolution against Analog Input lowers but systems sensitive to noise become less influenced by noise due to quantizing Function. The quantizing setting value is of percentage over the maximum analog input value. Therefore, the maximum input value equals to 10V and if the quantizing value is set to 1%, the value is changed by 0.6Hz (In case that the maximum frequency is 60Hz) in the interval of 0.1V. To remove any effect of changes in analog input values, different output frequencies shall be used to respond when input values increase and when input values decrease.

As seen below, the quantizing value is divided by four and output frequency will be changed and then, the quantizing value will increase accordingly from the next step if the values higher than three fourths of the quantizing value are inputted when the analog input values increase. If analog input value decreases by the values higher than one fourths of the quantizing value, output frequency will be changed if the analog input value is reduced.



7.3 Volt_Bipolar

Volt_Bipolar is set from XAIx Input Type in case that XAIx's Input ranges from voltage -10 to 10V. At this time, the following parameters are seen in XAI Group. Parameters displayed if Volt_Unipolar is set from Input Type.

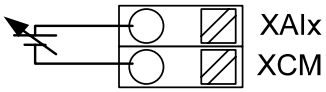
Function Mark	Setting Mark		Setting Range	Unit
XAIxInput Type	0	Volt_Bipolar	-	-
XVxMonitor[V]	-	0.00	-10~10	V
XVx Filter	-	10	0~10000	msec
XVx Volt x1	-	0.00	0~10	V
XVx Perc y1	-	0.00	0~100	%
XVx Volt x2	-	10.00	0~10	V
XVx Perc y2	-	100.00	0~100	%
XVx -volt x1'	-	0.00	0~10V	V
XVx -Perc y1'	-	0.00	0~100%	%
XVx -Volt x2'	-	-10.00	0~10V	V

Function Mark	Setting Mark		Setting Range	Unit
XVx -Perc y2’	-	-100.00	0~100%	%
XVx Inverting	-	No	No/Yes	-
XVx Quantizing	-	0.04	0.04~10	%

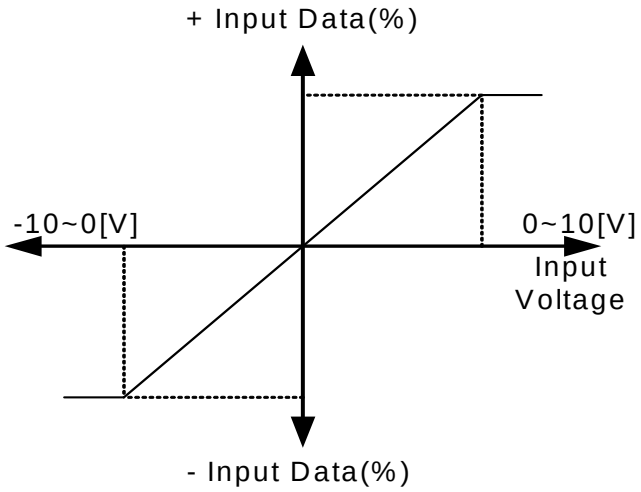
(Xix parameter is processed to be hidden.)

XVx -volt x1’ through XVx -Perc y2’ are displayed only when they are Bipolar and it is possible to set voltage 0 through -10V that will be inputted to V1 Terminal.

Connect with each other as following by using the external controller’s voltage output.

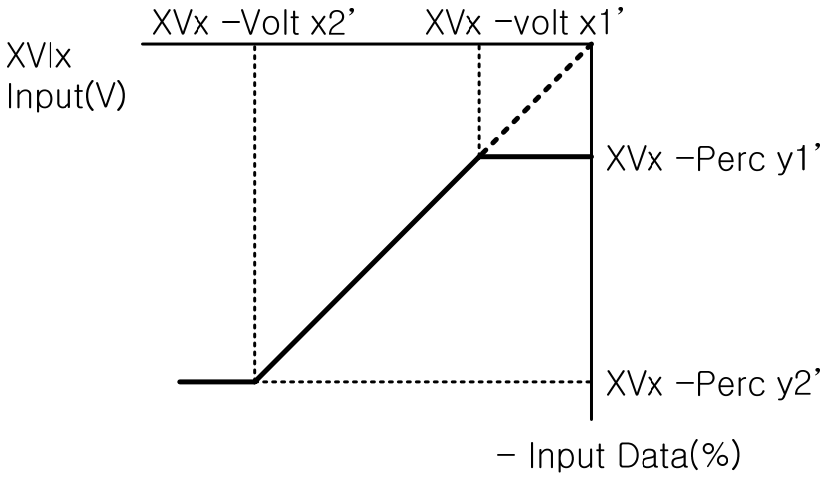


Output frequency runs as following for two way voltage Input(-10~+10V).



XVx -volt x1’ ~ XVx -Perc y2’ : Output frequency’s gradient and offset against the size of (-)input voltage can be set.

E.g.) When V1’s minimum (-) Input Voltage is -2V, output rate against -2V is 10% and its maximum voltage is -8V, its output frequency may change between 6Hz and 48Hz if output rate is set to 80%.



To set for 0~+10V, refer to XVx Volt x1 through XVx Perc y2.

In case that Input Data(%) is used as the inverter's target frequency, how to select the motor rotation with keypad, terminal block direction or two-way voltage input is shown in the following box.

To set for 0~+10V, refer to XVx Volt x1 through XVx Perc y2.

In case that Input Data(%) is used as the inverter's target frequency, how to select the motor rotation with keypad, terminal block direction or two-way voltage input is shown in the following box.

		Voltage Input	
		0~10V	-10~0V
Operating Command	FWD	Forward	Reverse
	REV	Reverse	Forward

7.4 Current

Current is set from XAIx Input Type in case that XAIx's Input ranges from current 0 to 20mA. At this time, the following parameters are seen in XAI Group. Parameters displayed if Current is set from XAIx Input Type.

Function Mark	Setting Mark		Setting Range	Unit
XAIxInput Type	0	Current	-	-
XIxMonitor[mA]	-	0.00	0~20	mA
XIx Filter	-	10	0~10000	msec
XIx Curr x1	-	4.00	0~20	mA
XIx Perc y1	-	0.00	0~100	%
XIx Curr x2	-	20.00	0~20	mA
XIx Perc y2	-	100.00	0~100	%
XIx Inverting	0	No	No/Yes	-
XIx Quantizing	-	0.04	0.04~10	%

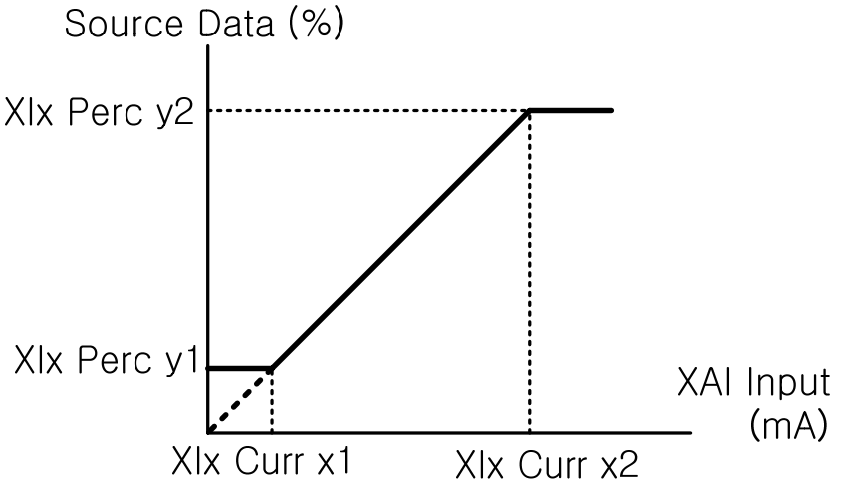
(XVx parameters are processed to be hidden, x indicates 1 through 4XAI Terminals.)

0~20mA of Current is inputted to Terminal block's XAIx Terminal as Source Data(%).

XIxMonitor[mA] : It shows the current size of XAIx Terminal. It is used when monitoring the size of the current that is currently inputted.

XIx Filter: The set time means the time it takes for the inverter to increase up to about 63% of the inputted I1 value when current Input is inputted in steps.

XIx Curr x1 ~ XIx Perc y2: Output frequency gradient and offset for the current size can be set as following:



XIx Inverting: If Yes is set one time, multiplicative inverse of Data(%) becomes Input Data(%).

XIx Quantizing: XVx Quantizing Function is as following.

Refer to “XVx Quantizing” on Page 41 .

8. Analog Input Correction (XAC Group)

Even though Since analog input values may be recognized higher or lower than their actual values due to errors with Extension I/O 2 elements or other external factors. For example, even though 10V is inputted, the recognized voltage may be higher or lower than it. These errors can be corrected by using XAC Group's parameters to recognize as 10V when inputting 10V.

The parameters used for correction may have deviations depending on the setting of XAIxInput Type.

8.1 Volt_Unipolar Input Correction

This method is to correct voltage only when inputting voltage 0 through 10V.

The following parameter list can be used for correction.

Group	Function Mark	Setting Mark		Setting Range	Unit
XAI	XAIxInput Type	0	Volt_Unipolar	-	-
XAI	XVxMonitor[V]	-		-	-
XAC	XAI Adjust CH	Input terminal block No.		1 ~ 4	-
XAC	CalcXAI Adjust	0	None	-	-
XAC	XVx 0V Perc	-0.60		-20.00 ~ 20.00	%
XAC	XVx 10V Perc	90.40		80.00 ~ 100.00	%

(x refers to the number of the Input terminal block to be corrected.)

(1) Automatic Correction

1. Set the number of the Analog Input Terminal to be corrected to XAI Adjust CH(e.g. set 1 in case of XAI1 Terminal.)

2. Input 0V to XAIx Terminal and select Value 1 message 0 Volt from XAC-9 CalcXAI Adjust parameter. Then, XVx 0V Perc is automatically calculated and the value is changed.

3. Input 10V to XAIx Terminal and select Value 2 message 10 Volt from XAC-9 CalcXAI Adjust parameter. Then, XVx 10V Perc is automatically calculated and the value is changed.

(2) Manual Correction

Description on how to correct voltage manually is presented as following:

1. Input the minimum value that can be inputted to XAIx Terminal. But, the value shall be 0V or over. If the minimum value is of – (minus), input 0V and select XAIxInput Type as Volt_Bipolar if – voltage is needed to be measured.
2. Measure Input voltage and compare the measured value with the one written on XVxMonitor[V] value.
3. Compare Input voltage with the one written on XVxMonitor[V] and lower XVx 0V Perc's % value if XVxMonitor[V]value is bigger or raise XVx 0V Perc's % value if XVxMonitor[V]value is smaller to make both Input voltage and XVxMonitor[V] value equal to each other..
4. Input the maximum value that can be inputted to XAIx Terminal.
5. Measure Input voltage and compare the measured value with the one written on XVxMonitor[V] value.
6. Compare Input voltage with the one written on XVxMonitor[V] and lower XVx 10V Perc's % value if XVxMonitor[V]value is bigger or raise XVx 10V Perc's % value if XVxMonitor[V]value is smaller to make both Input voltage and XVxMonitor[V] value equal to each other.

8.2 Volt_Bipolar Input Correction

This method is to correct voltage only when inputting voltage-10 through 10V.

The following parameter list can be used for correction.

Group	Function Mark	Setting Mark		Setting Range	Unit
XAI	XAIxInput Type	1	Volt_Bipolar	-	-
XAI	XVxMonitor[V]	-		-	-
XAC	XAI Adjust CH	Input terminal block No.		1 ~ 4	-

Group	Function Mark	Setting Mark	Setting Range	Unit
XAC	CalcXAI Adjust	0 None	-	-
XAC	XVx 0V Perc	-0.60	-20.00 ~ 20.00	%
XAC	XVx 10V Perc	90.40	80.00 ~ 100.00	%
XAC	XVx -10V Perc	-90.40	-100.00 ~ -80.00	%

(x refers to the number of the input terminal block to be corrected.)

(1) Auto Correction

1. Set the number of the Analog Input Terminal to be corrected to XAI Adjust CH(e.g. set 1 in case of XAI1 Terminal.)

2. Input 0V to XAIx Terminal and select Value 1 message 0 Volt from XAC-9 CalcXAI Adjust parameter. Then, XVx 0V Perc is automatically calculated and the value is changed.

3. Input 10V to XAIx Terminal and select Value 2 message 10 Volt from XAC-9 CalcXAI Adjust parameter. Then, XVx 10V Perc is automatically calculated and the value is changed.

4. Input -10V to XAIx Terminal and select Value 3 message -10 Volt XAC-9 from CalcXAI Adjust parameter. Then, XVx -10V Perc is automatically calculated and the value is changed.

(2) Manual Correction

Description on how to correct voltage manually is presented as following:

1. Input 0V value to XAIx Terminal.

2. Lower XVx 0V Perc's % value if + value comes from XVxMonitor[V] or raise XVx 0V Perc's % value if - value comes from XVxMonitor[V] to make XVxMonitor[V] value equal to 0V.

3. Input the maximum value that can be inputted to XAIx Terminal.

4. Measure Input voltage and compare the measured value with the one written on XVxMonitor[V] value.

5. Compare Input voltage with the one that comes from XVxMonitor[V] and lower XVx 10V Perc's % value if XVxMonitor[V]value is bigger or raise XVx 10V Perc's % value if the value that comes from

XVxMonitor[V] is smaller to make both Input voltage and XVxMonitor[V] value equal to each other.

6. Input the minimum value that can be inputted to XAIx Terminal.
7. Measure Input voltage and compare the measured value with the one written on XVxMonitor[V] value.
8. Compare Input voltage with the one that comes from XVxMonitor[V] and lower XVx -10V Perc's % value if XVxMonitor[V]value is bigger or raise XVx -10V Perc's % value if XVxMonitor[V]value is smaller to make both Input voltage and XVxMonitor[V] value equal to each other.

8.3 Current Input Correction

This method is to correct current only when inputting current 0 through 20mA.

The following parameter list can be used for correction.

Group	Function Mark	Setting Mark		Setting Range	Unit
XAI	XAIxInput Type	2	Current	-	-
XAI	XIxMonitor[mA]	-		-	-
XAC	XAI Adjust CH	Input Terminal Block No.		1 ~ 4	-
XAC	CalcXAI Adjust	0	None	-	-
XAC	XIx 0mA Perc	-5.64		0.00 ~ 40.00	%
XAC	XIx 20mA Perc	93.98		80.00 ~ 100.00	%

(x refers to the number of the input terminal block to be corrected)

(1) Auto Correction

1. Set the number of the Analog Input Terminal to be corrected to XAI Adjust CH(e.g. set 1 in case of XAI1 Terminal).
2. Input 0mA to XAIx Terminal and select Value 4 message 0 mA from XAC-9 CalcXAI Adjust parameter. Then, XIx 0mA Perc is automatically calculated and the value is changed.
3. Input 20mA to XAIx Terminal and select Value 5 message 20 mA from XAC-9 CalcXAI Adjust parameter. Then, XIx 20mA Perc is automatically calculated and the value is changed.

(2) Manual Correction

Description on how to correct current manually is presented as following.

1. Input the minimum value that can be inputted to XAIx Terminal.
2. Measure input current and compare the measured value with the one written on XIxMonitor[mA].
3. Compare Input Current with the one that comes from XIxMonitor[mA] and lower XIx 0mA Perc's % value if XIxMonitor[mA] value is bigger or raise XIx 0mA Perc's % value if XIxMonitor[mA] value is smaller to make both Input current and XIxMonitor[mA] equal to each other.
4. Input the maximum value that can be inputted to XAIx Terminal.
5. Measure Input Current and compare the measured value with the one written on XIxMonitor[mA] value.
6. Compare Input Current with the one that comes from XIxMonitor[mA] and lower XIx 20mA Perc's % value if XIxMonitor[mA]value is bigger or raise XIx 20mA Perc's % value if XIxMonitor[mA]value is smaller to make both Input current and XIxMonitor[mA] equal to each other.

9. Lost Command

Lost Command is generatged when it is not within the setting range in case that Analog Input is used as the inverter's control source. The setting range is described in 9. Analog Input (XAI Group).

This is a parameter list related to Lost command.

Group	Function Mark	Setting Mark		Setting Range		Unit
PRT-12	Lost Cmd Mode	0	None	0	None	
				1	Free-Run	
				2	Dec	
				3	Hold Input	
				4	Hold Output	
				5	Lost Preset	
PRT-13	Lost Cmd Time	1.0		0.1~120.0		Sec
PRT-14	Lost Preset F	0		0~Max Freq		Hz

Lost Cmd Mode: It sets the inverter's movement when Lost Command is generated.

Setting Value		Function
0	None	It remains in the previous state.
1	Free-Run	Because Lost Command Trip takes place, Free Run stops.
2	Dec	Lost Command Trip takes place and it stops at Trip decelerating time.
3	Hold Input	Lost Command Warning is generated and it moves under the operating command that has been received before.
4	Hold Output	Lost Command Warning is generated and it moves in its previous operating Speed.
5	Lost Preset	Lost Command Warning is generated and it is operated in the Speed set in PRT-14.

Lost Cmd Time: Lost Command Trip or Warning Time is set. That is, the time set in Lost Command State wears on, Lost Command Trip or Warning is automatically generated.

Lost Preset F: After Lost Cmd Time elapses in Lost Command State, Warning will be generated and the inverter will move in Lost Preset Speed if When Lost Preset's Speed is set in Lost Cmd Mode.

10. LED Information and Trouble Shooting

Extension I/O 2 has only one LED. If LED is On, Extension I/O 2 is normal. If LED is Off, Extension I/O 2 does not work. Turn the inverter off and remount options.

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