

FnIO G-Series

GT-3914, GT-3924, GT-3934, GT-3944

GT-3914 (4 Channels, Differential Current Input, 0~20mA / 4~20mA / -20~20mA, 12bits)

GT-3924 (4 Channels, Differential Voltage Input, 0~10V / 0~5V / -10~10V / -5~5V, 12bits)

GT-3934 (4 Channels, Differential Current Input, 0~20mA / 4~20mA / -20~20mA, 16bits)

GT-3944 (4 Channels, Differential Voltage Input, 0~10V / 0~5V / -10~10V / -5~5V, 16bits)

Specification

History

REV.	PAGES	REMARKS	DATE	Editor
1.00	16		Oct. 25, 2016	Kim,Hongseok
1.01		Specification(GT-3914)	Jan. 09, 2017	Kim, Hongseok
1.02	17-29	Added GT-3934, GT-3944	Mar 09, 2018	Soyeong, Park
1.03	17, 23	Edit 16bit Model_ Resolution in Ranges	June 14, 2018	Soyeong, Park
1.04		Edit Operation Temperature	Aug 10, 2018	Soyeong, Park

Specification

Table of Contents

<u>History</u>	2
<u>Table of Contents</u>	3
<u>1.Environment Specification</u>	5
<u>2.GT-3914 (4 Channels, Differential Current Input, 0~20mA / 4~20mA / -20~20mA, 12bits)</u>	6
<u>2.1.GT-3914 Specification</u>	6
<u>2.2.GT-3914 Wiring Diagram</u>	7
<u>2.3.GT-3914 LED Indicator</u>	8
<u>2.3.1.LED Indicator</u>	8
<u>2.3.2.Channel Status LED</u>	8
<u>2.4.Data Value / Current</u>	9
<u>2.5.Mapping Data into the Image Table</u>	10
<u>3.GT-3924 (4 Channels, Differential Voltage Input, 0~10V / 0~5V / -10~10V / -5~5V, 12bits)</u>	11
<u>3.1.GT-3924 Specification</u>	11
<u>3.2.GT-3924 Wiring Diagram</u>	12
<u>3.3.GT-3924 LED Indicator</u>	13
<u>3.3.1.LED Indicator</u>	13
<u>3.3.2.Channel Status LED</u>	13
<u>3.4.Data Value / Voltage</u>	14
<u>3.5.Mapping Data into the Image Table</u>	16
<u>4.GT-3934 (4 Channels, Differential Current Input, 0~20mA / 4~20mA / -20~20mA, 16bits)</u>	17
<u>4.1.GT-3934 Specification</u>	17
<u>4.2.GT-3934 Wiring Diagram</u>	18
<u>4.3.GT-3934 LED Indicator</u>	19
<u>4.3.1.LED Indicator</u>	19
<u>4.3.2.Channel Status LED</u>	19
<u>4.4.Data Value / Voltage</u>	20
<u>4.5.Mapping Data into the Image Table</u>	22
<u>5.GT-3944 (4 Channels, Differential Voltage Input, 0~10V / 0~5V / -10~10V / -5~5V, 16bits)</u>	23
<u>5.1.GT-3944 Specification</u>	23
<u>5.2.GT-3944 Wiring Diagram</u>	24
<u>5.3.GT-3944 LED Indicator</u>	25
<u>5.3.1.LED Indicator</u>	25
<u>5.3.2.Channel Status LED</u>	25
<u>5.4.Data Value / Voltage</u>	26

Specification

<u>5.5.Mapping Data into the Image Table.....</u>	28
<u>6.Input Range Setting & Conversion Time Setting.....</u>	29
<u>6.1.GT-3914, GT-3934.....</u>	29
<u>6.2.GT-3924, GT-3944.....</u>	29

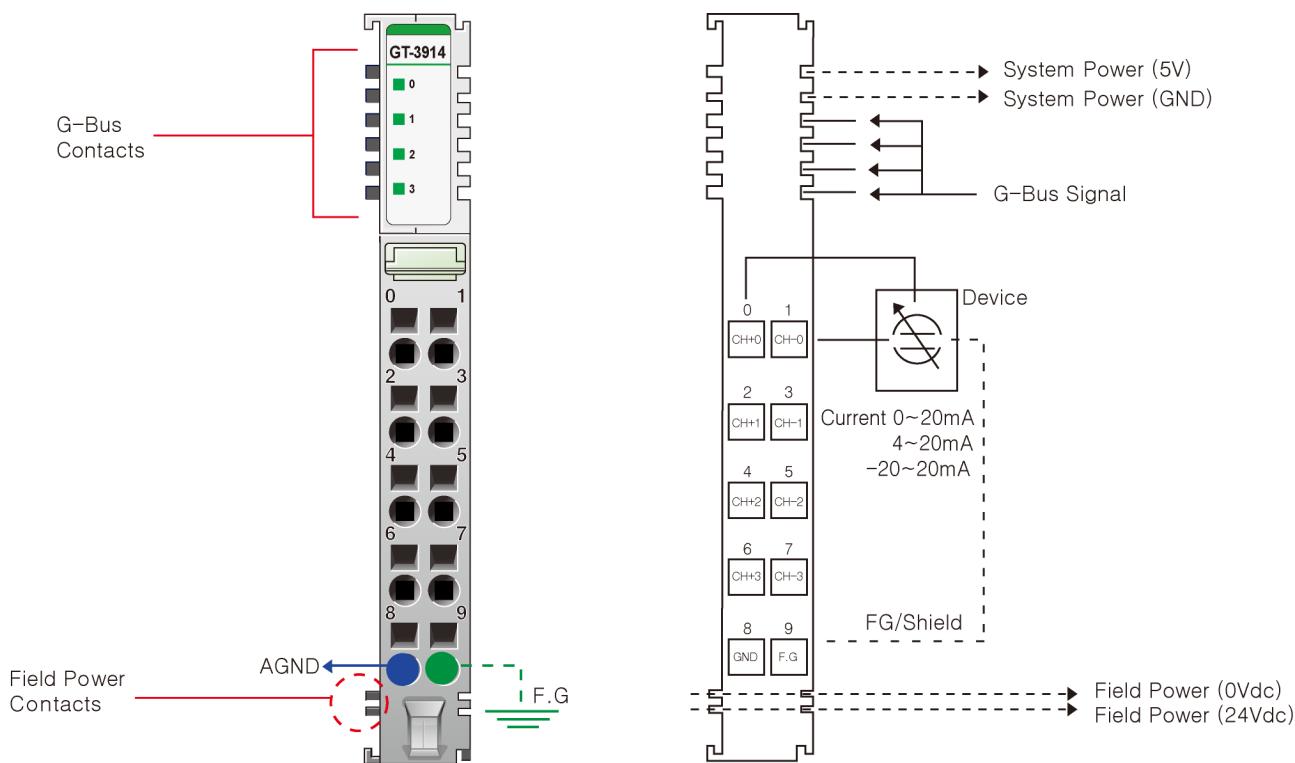
Specification

1. Environment Specification

Environmental Specification	
Operation Temperature	-40°C ~ 70°C
UL Temperature	-20°C ~ 60°C
Non-Operating Temperature	-40°C ~ 85°C
Relative Humidity	5% ~ 90% Non-condensing
Mounting	DIN rail
General Specification	
Shock Operating	IEC 60068-2-27
Vibration Resistance	<p>Based on IEC 60068-2-6</p> <p>Sine Vibration</p> <ul style="list-style-type: none"> - 5 ~ 25Hz : $\pm 1.6\text{mm}$ - 25 ~ 300Hz : 4g - Sweep Rate : 1 Oct/min, 20 cycles <p>Random Vibration</p> <ul style="list-style-type: none"> - 10 ~ 40 Hz : $0.0125 \text{ g}^2/\text{Hz}$ - 40 ~ 100 Hz : $0.0125 \rightarrow 0.002 \text{ g}^2/\text{Hz}$ - 100 ~ 500 Hz : $0.002 \text{ g}^2/\text{Hz}$ - 500 ~ 2000 Hz : $0.002 \rightarrow 1.3 \times 10^{-4} \text{ g}^2/\text{Hz}$ - Test time : 1hrs for each test
Industrial Emissions	EN61000-6-4/All : 2011
Industrial Immunity	EN 61000-6-2 : 2005
Installation Position	Vertical and horizontal installation is available
Product Certifications	CE, UL

Specification**2. GT-3914 (4 Channels, Differential Current Input, 0~20mA / 4~20mA / -20~20mA, 12bits)****2.1. GT-3914 Specification**

Items	Specification
Input Specification	
Inputs Per Module	4 Channels Differential, Non-isolated Between Channels
Indicators	4 Green Input Status LEDs
Resolution in Ranges	12 bits : 4.88uA/bit(0~20mA) 12 bits : 3.91uA/bit(4~20mA) 12 bits : 9.77uA/bit(-20~20mA)
Input Range	0~20mA, 4~20mA, -20~20mA
Data Format	16bits Integer (2' compliment)
Module Error	$\pm 0.1\%$ Full Scale @ 25°C $\pm 0.3\%$ Full Scale @ -40°C, 70°C
Input Impedance	121.5Ω
Diagnostic	Field Power Off : LED Blinking Field Power On : LED Off < 0.5% (Maximum Input Value) Field Power On : LED On > 0.5% (Maximum Input Value) Maximum Range Over : LED Off > 21mA Minimum Range Over : LED Off < 3mA (4~20mA) Minimum Range Over : LED Off < -20mA (-20~20mA)
Conversion Time	1msec / All channel
Calibration	Not Required
Common Type	1 Common, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 30mA @ 5Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : DC/DC Converter Isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 70°C: 18 ~ 26.4Vdc 50°C: 18 ~ 32Vdc Power Dissipation : Max. 40mA@24Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	58g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to 'Environment Specification'

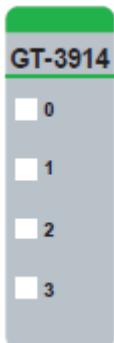
Specification**2.2. GT-3914 Wiring Diagram**

Pin No.	Signal Description	Signal Description	Pin No.
0	Input Channel 0(+)	Input Channel 0(-)	1
2	Input Channel 1(+)	Input Channel 1(-)	3
4	Input Channel 2(+)	Input Channel 2(-)	5
6	Input Channel 3(+)	Input Channel 3(-)	7
8	Input Channel Common(AGND)	Field Ground	9

Specification

2.3. GT-3914 LED Indicator

2.3.1. LED Indicator



LED No.	LED Function / Description	LED Color
0	INPUT Channel 0	Green
1	INPUT Channel 1	Green
2	INPUT Channel 2	Green
3	INPUT Channel 3	Green

2.3.2. Channel Status LED

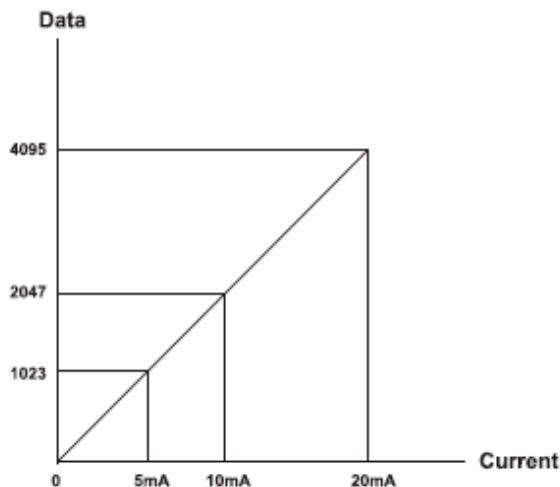
Status	LED	To indicate
Normal Operation	[LED Off < 0.5% (Maximum Input Value)] - Channel OFF [LED On > 0.5% (Maximum Input Value)] - Channel Green	Normal Operation
Normal Operation	0~20mA : LED Off > 21mA 4~20mA : LED Off > 21mA, LED Off < 3mA -20~20mA : LED Off > 21mA, LED Off < -21mA	Over range Check
Field Power Error	All Channel Repeat the Green and OFF	Field Power is unconnected

Specification

2.4. Data Value / Current

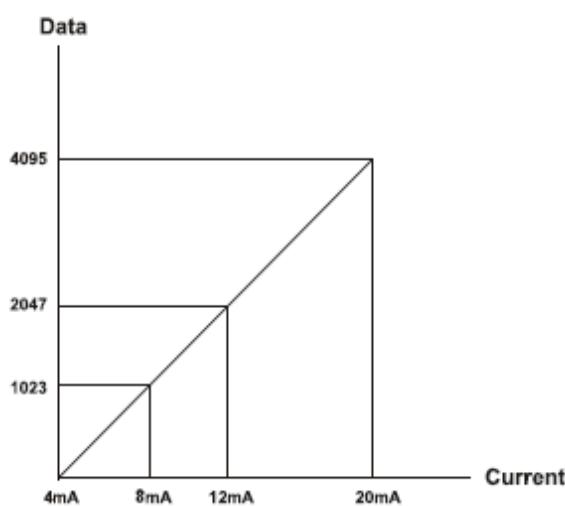
Current Range : 0~20mA

Current	0.0mA	5.0mA	10.0mA	20.0mA
Data(Hex)	H0000	H03FF	H07FF	H0FFF



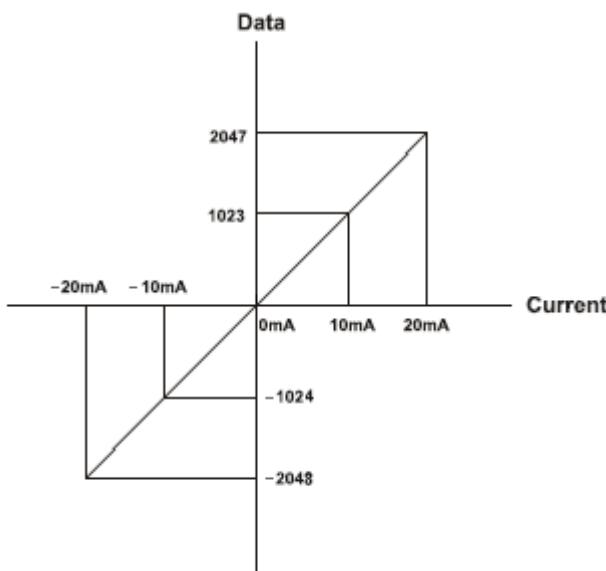
Current Range : 4~20mA

Current	4.0mA	8.0mA	12.0mA	20.0mA
Data(Hex)	H0000	H03FF	H07FF	H0FFF



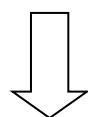
Specification**Current Range : -20~20mA**

Current	-20.0mA	-10.0mA	0mA	+10.0mA	+20.mA
Data(Hex)	HF800	HFC00	H0000	H03FF	H07FF

**2.5. Mapping Data into the Image Table**

- **Input Module Data**

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3

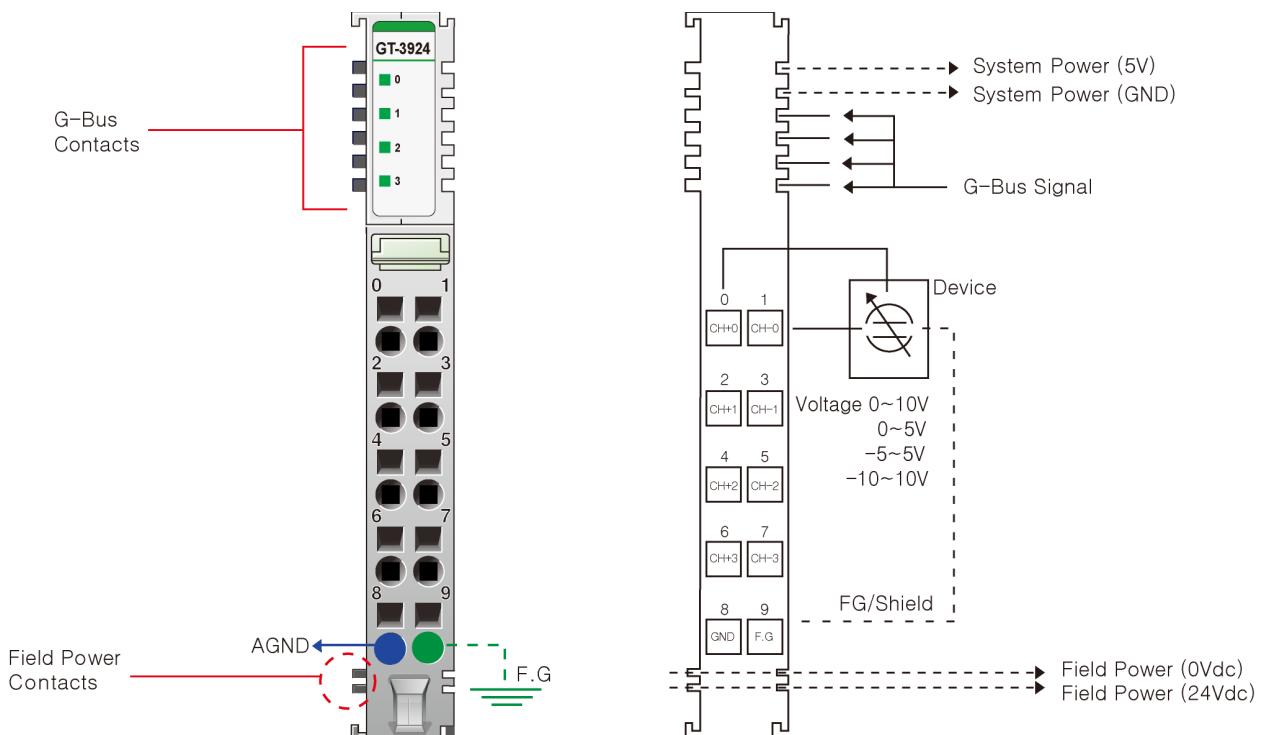


- **Input Image Value**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0				Analog Input Ch0 Low byte				
Byte 1				Analog Input Ch0 High byte				
Byte 2				Analog Input Ch1 Low byte				
Byte 3				Analog Input Ch1 High byte				
Byte 4				Analog Input Ch2 Low byte				
Byte 5				Analog Input Ch2 High byte				
Byte 6				Analog Input Ch3 Low byte				
Byte 7				Analog Input Ch3 High byte				

Specification**3. GT-3924 (4 Channels, Differential Voltage Input, 0~10V / 0~5V / -10~10V / -5~5V, 12bits)****3.1. GT-3924 Specification**

Items	Specification
Input Specification	
Inputs Per Module	4 Channels Differential, Non-isolated Between Channels
Indicators	4 Green Input Status LEDs
Resolution in Ranges	12 bits : 2.44mV/Bit(0~10V) 12 bits : 1.22mV/Bit(0~5V) 12 bits : 4.88mV/Bit(-10~10V) 12 bits : 2.44mV/Bit(-5~5V)
Input Range	0~10Vdc, 0~5Vdc, -10~10Vdc, -5~5Vdc
Data Format	16bits Integer (2' compliment)
Module Error	±0.1% Full Scale @ 25°C ±0.3% Full Scale @ -40°C 70°C
Input Impedance	667kΩ
Diagnostic	Diagnostic Field Power Off : LED Blinking Field Power On : LED Off < 0.5% (Maximum Input Value) Field Power On : LED On > 0.5% (Maximum Input Value)
Conversion Time	1msec / All channel ($\leq 0.25\text{ms}$ per channel)
Calibration	Not Required
Common Type	1 Common, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 30mA @ 5Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-Isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 18 ~ 32Vdc Power Dissipation : Max. 45mA@24Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	58g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to ‘Environment Specification’

Specification**3.2. GT-3924 Wiring Diagram**

Pin No.	Signal Description	Signal Description	Pin No.
0	Input Channel 0(+)	Input Channel 0(-)	1
2	Input Channel 1(+)	Input Channel 1(-)	3
4	Input Channel 2(+)	Input Channel 2(-)	5
6	Input Channel 3(+)	Input Channel 3(-)	7
8	Input Channel Common(AGND)	Field Ground	9

Specification

3.3. GT-3924 LED Indicator

3.3.1. LED Indicator



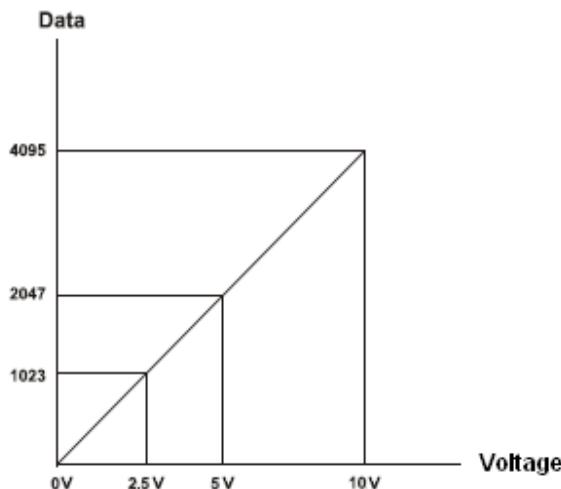
LED No.	LED Function / Description	LED Color
0	INPUT Channel 0	Green
1	INPUT Channel 1	Green
2	INPUT Channel 2	Green
3	INPUT Channel 3	Green

3.3.2. Channel Status LED

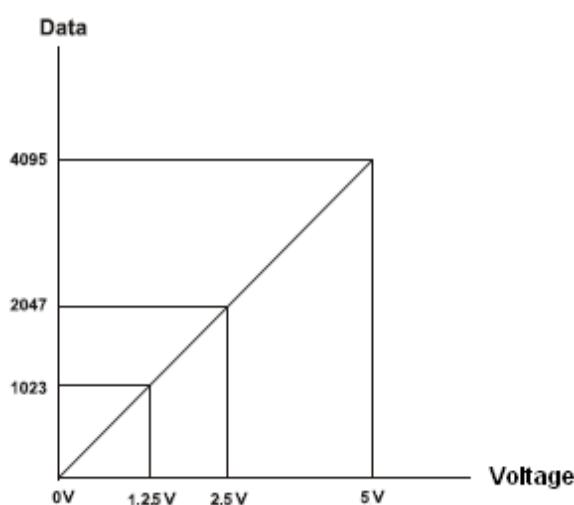
Status	LED	To indicate
Normal Operation	[LED Off < 0.5% (Maximum Input Value)] - Channel OFF [LED On > 0.5% (Maximum Input Value)] - Channel Green	Normal Operation
Field Power Error	All Channel Repeat the Green and OFF	Field Power is unconnected

Specification**3.4. Data Value / Voltage****Voltage Range : 0~10V**

Voltage	0V	2.5V	5.0V	10.0V
Data(Hex)	H0000	H03FF	H07FF	H0FFF

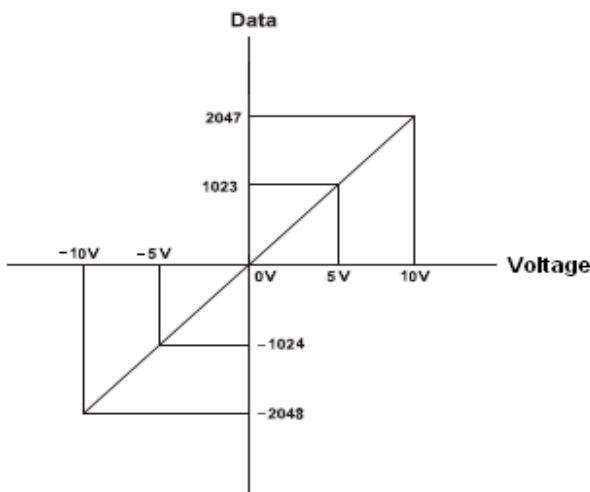
**Voltage Range : 0~5V**

Current	0V	1.25V	2.5V	5.0V
Data(Hex)	H0000	H03FF	H07FF	H0FFF

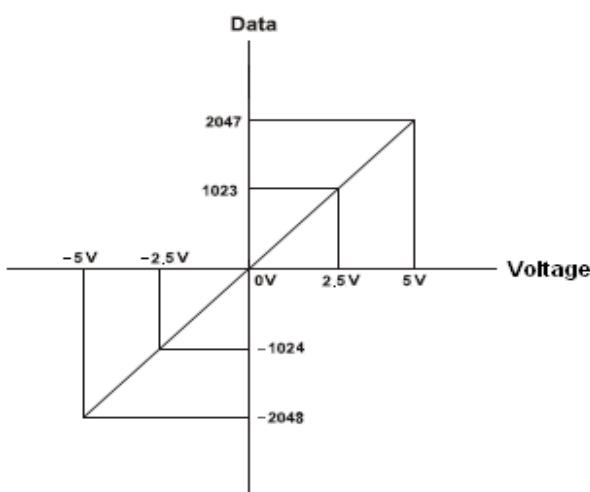


Specification**Voltage Range : -10~10V**

Current	-10V	-5V	0V	5.0V	10.0V
Data(Hex)	HF800	HFC00	H0000	H03FF	H07FF

**Voltage Range : -5~5V**

Current	-5V	-2.5V	0V	2.5V	5.0V
Data(Hex)	HF800	HFC00	H0000	H03FF	H07FF

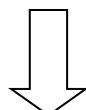


Specification

3.5. Mapping Data into the Image Table

- **Input Module Data**

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3



- **Input Image Value**

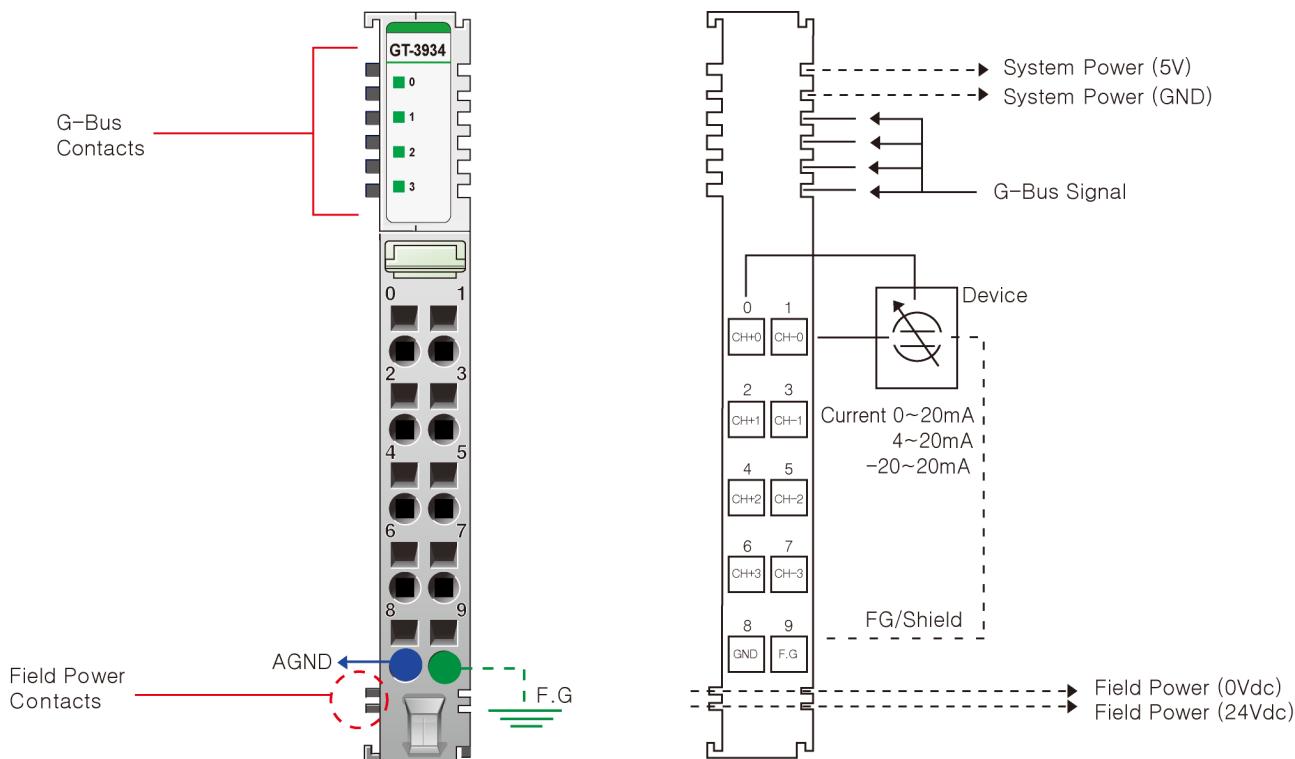
Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0				Analog Input Ch0 Low byte				
Byte 1				Analog Input Ch0 High byte				
Byte 2				Analog Input Ch1 Low byte				
Byte 3				Analog Input Ch1 High byte				
Byte 4				Analog Input Ch2 Low byte				
Byte 5				Analog Input Ch2 High byte				
Byte 6				Analog Input Ch3 Low byte				
Byte 7				Analog Input Ch3 High byte				

Specification

4. GT-3934 (4 Channels, Differential Current Input, 0~20mA / 4~20mA / -20~20mA, 16bits)

4.1. GT-3934 Specification

Items	Specification
Input Specification	
Inputs Per Module	4 Channels Differential, Non-isolated Between Channels
Indicators	4 Green Input Status LEDs
Resolution in Ranges	16bit(Include Sign) 15 bits : 0.61uA/Bit(0~20mA) 15 bits : 0.49uA/Bit(4~20mA) 15bit(Include Sign) 15 bits : 1.22uA/Bit(-20~20mA)
Input Range	0~20mA, 4~20mA, -20~20mA
Data Format	16bits Integer (2' compliment)
Module Error	$\pm 0.1\%$ Full Scale @ 25°C $\pm 0.3\%$ Full Scale @ -40°C 70°C
Input Impedance	121.5Ω
Diagnostic	Field Power Off : LED Blinking Field Power On : LED Off < 0.5% (Maximum Input Value) Field Power On : LED On > 0.5% (Maximum Input Value) Minimum Range Over : LED Off < 3mA (4~20mA) Maximum Range Over : LED Off > 21mA(-20~20mA) Minimum Range Over : LED Off < -21mA (-20~20mA)
Conversion Time	1msec / All channel
Calibration	Not Required
Common Type	1 Common, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 30mA @ 5Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : DC/DC Converter Isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 70°C: 18 ~ 26.4Vdc 50°C: 18 ~ 32Vdc Power Dissipation : Max. 40mA@24Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	58g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to 'Environment Specification'

Specification**4.2. GT-3934 Wiring Diagram**

Pin No.	Signal Description	Signal Description	Pin No.
0	Input Channel 0(+)	Input Channel 0(-)	1
2	Input Channel 1(+)	Input Channel 1(-)	3
4	Input Channel 2(+)	Input Channel 2(-)	5
6	Input Channel 3(+)	Input Channel 3(-)	7
8	Input Channel Common(AGND)	Field Ground	9

Specification

4.3. GT-3934 LED Indicator

4.3.1. LED Indicator



The diagram shows a vertical stack of four rectangular boxes, each containing a small square icon and a number. From top to bottom, the numbers are 0, 1, 2, and 3. The background behind the stack is grey.

LED No.	LED Function / Description	LED Color
0	INPUT Channel 0	Green
1	INPUT Channel 1	Green
2	INPUT Channel 2	Green
3	INPUT Channel 3	Green

4.3.2. Channel Status LED

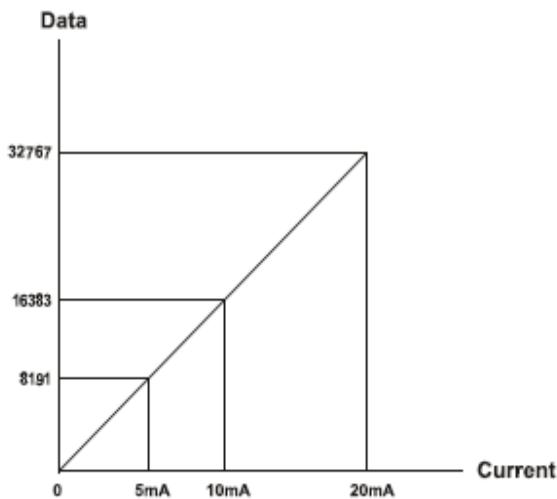
Status	LED	To indicate
Normal Operation	[LED Off < 0.5% (Maximum Input Value)] - Channel OFF [LED On > 0.5% (Maximum Input Value)] - Channel Green	Normal Operation
Normal Operation	4~20mA : LED Off < 3mA -20~20mA : LED Off > 21mA, LED Off < -21mA	Over range Check
Field Power Error	All Channel Repeat the Green and OFF	Field Power is unconnected

Specification

4.4. Data Value / Current

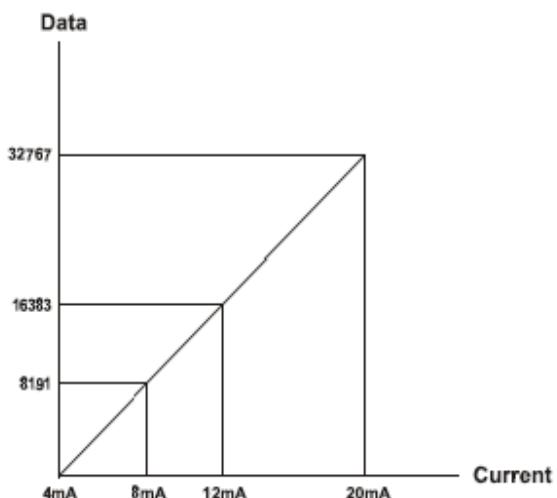
Current Range : 0~20mA

Current	0.0mA	5.0mA	10.0mA	20.0mA
Data(Hex)	H0000	H1FFF	H3FFF	H7FFF



Current Range : 4~20mA

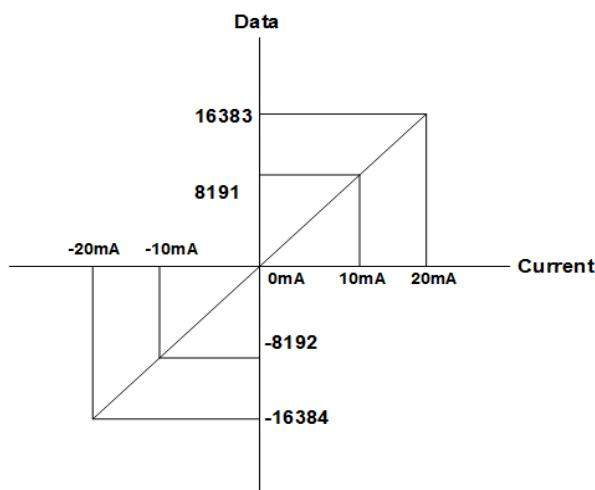
Current	4.0mA	8.0mA	12.0mA	20.0mA
Data(Hex)	H0000	H1FFF	H3FFF	H7FFF



Specification

Current Range : -20~20mA

Current	-20.0mA	-10.0mA	0mA	+10.0mA	+20.mA
Data(Hex)	HC000	HE000	H0000	H1FFF	H3FFF

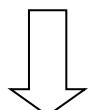


Specification

4.5. Mapping Data into the Image Table

- **Input Module Data**

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3

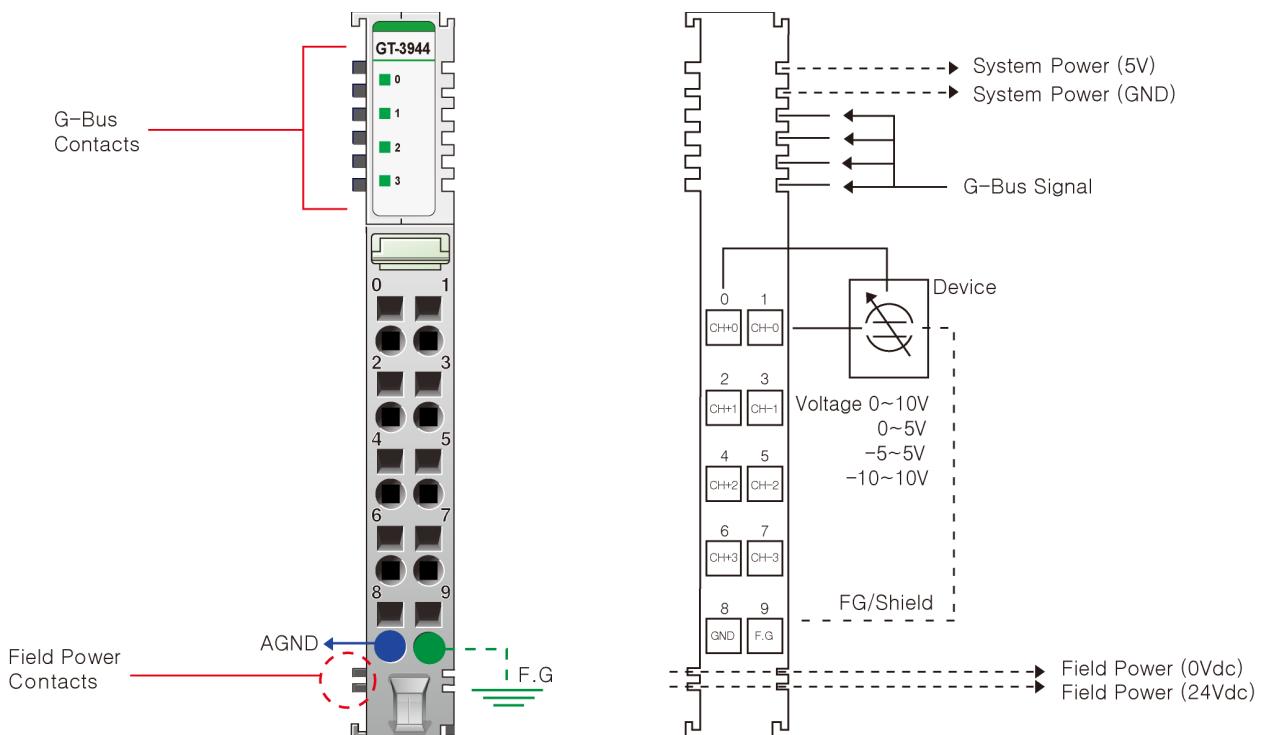


- **Input Image Value**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0					Analog Input Ch0 Low byte			
Byte 1					Analog Input Ch0 High byte			
Byte 2					Analog Input Ch1 Low byte			
Byte 3					Analog Input Ch1 High byte			
Byte 4					Analog Input Ch2 Low byte			
Byte 5					Analog Input Ch2 High byte			
Byte 6					Analog Input Ch3 Low byte			
Byte 7					Analog Input Ch3 High byte			

Specification**5. GT-3944 (4 Channels, Differential Voltage Input, 0~10V / 0~5V / -10~10V / -5~5V, 16bits)****5.1. GT-3944 Specification**

Items	Specification
Input Specification	
Inputs Per Module	4 Channels Differential, Non-isolated Between Channels
Indicators	4 Green Input Status LEDs
Resolution in Ranges	16bit(Include Sign) 15 bits : 0.31mV/Bit(0~10V) 15 bits : 0.15mV/Bit(0~5V) 15bit(Include Sign) 15 bits : 0.61mV/Bit(-10~10V) 15 bits : 0.31mV/Bit(-5~5V)
Input Range	0~10Vdc, 0~5Vdc, -10~10Vdc, -5~5Vdc
Data Format	16bits Integer (2' compliment)
Module Error	±0.1% Full Scale @ 25°C ±0.3% Full Scale @ -40°C 70°C
Input Impedance	667kΩ
Diagnostic	Diagnostic Field Power Off : LED Blinking Field Power On : LED Off < 0.5% (Maximum Input Value) Field Power On : LED On > 0.5% (Maximum Input Value)
Conversion Time	1msec / All channel (\leq 0.25ms per channel)
Calibration	Not Required
Common Type	1 Common, Field Power 0V is Common(AGND)
General Specification	
Power Dissipation	Max. 30mA @ 5Vdc
Isolation	I/O to Logic : Photocoupler Isolation Field power : Non-Isolation
Field Power	Supply Voltage : 24Vdc nominal Voltage Range : 18 ~ 32Vdc Power Dissipation : Max. 45mA@24Vdc
Wiring	I/O Cable Max. 2.0mm ² (AWG 14)
Weight	58g
Module Size	12mm x 99mm x 70mm
Environment Condition	Refer to 'Environment Specification'

Specification**5.2. GT-3944 Wiring Diagram**

Pin No.	Signal Description	Signal Description	Pin No.
0	Input Channel 0(+)	Input Channel 0(-)	1
2	Input Channel 1(+)	Input Channel 1(-)	3
4	Input Channel 2(+)	Input Channel 2(-)	5
6	Input Channel 3(+)	Input Channel 3(-)	7
8	Input Channel Common(AGND)	Field Ground	9

Specification

5.3. GT-3944 LED Indicator

5.3.1. LED Indicator



LED No.	LED Function / Description	LED Color
0	INPUT Channel 0	Green
1	INPUT Channel 1	Green
2	INPUT Channel 2	Green
3	INPUT Channel 3	Green

5.3.2. Channel Status LED

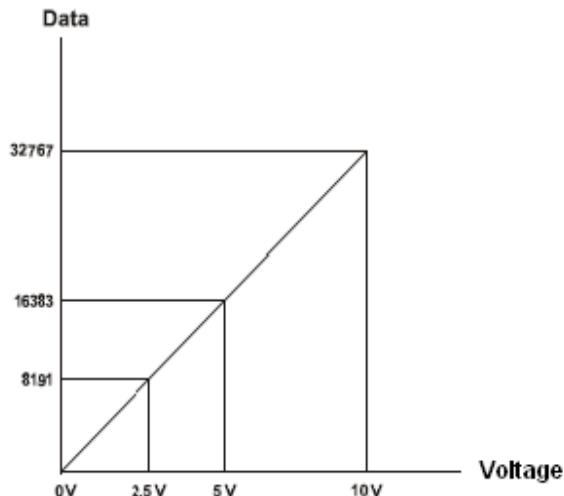
Status	LED	To indicate
Normal Operation	[LED Off < 0.5% (Maximum Input Value)] - Channel OFF [LED On > 0.5% (Maximum Input Value)] - Channel Green	Normal Operation
Field Power Error	All Channel Repeat the Green and OFF	Field Power is unconnected

Specification

5.4. Data Value / Voltage

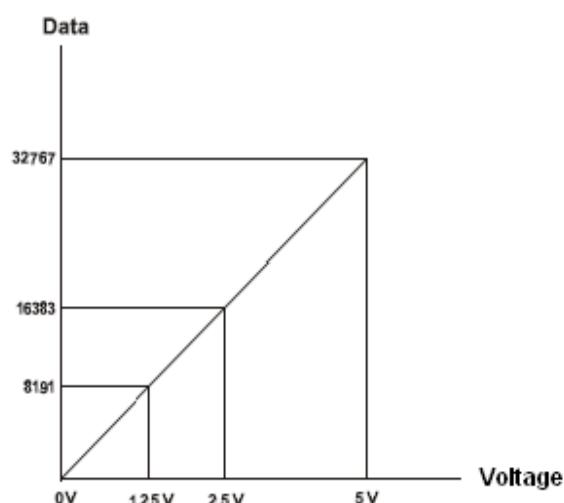
Voltage Range : 0~10V

Voltage	0V	2.5V	5.0V	10.0V
Data(Hex)	H0000	H1FFF	H3FFF	H7FFF



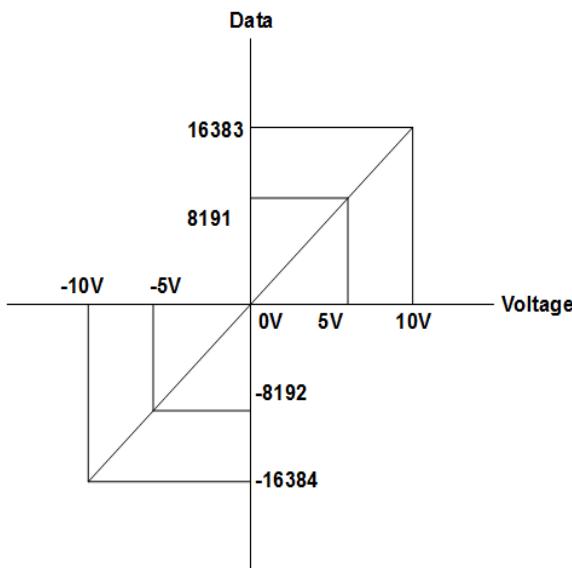
Voltage Range : 0~5V

Current	0V	1.25V	2.5V	5.0V
Data(Hex)	H0000	H1FFF	H3FFF	H7FFF

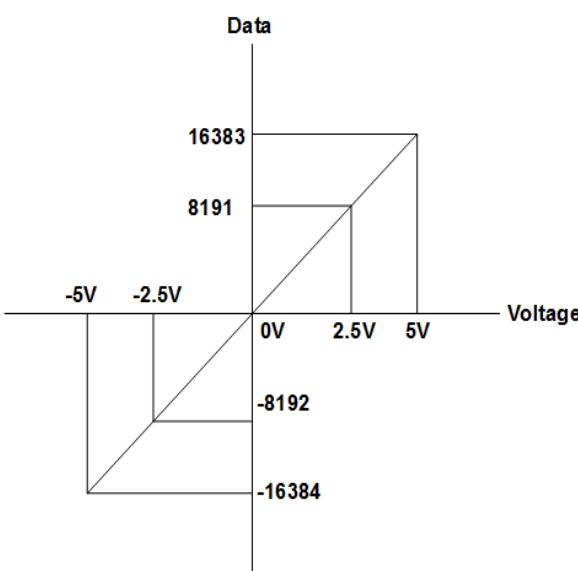


Specification**Voltage Range : -10~10V**

Current	-10V	-5V	0V	5.0V	10.0V
Data(Hex)	HC000	HE000	H0000	H1FFF	H3FFF

**Voltage Range : -5~5V**

Current	-5V	-2.5V	0V	2.5V	5.0V
Data(Hex)	HC000	HE000	H0000	H1FFF	H3FFF

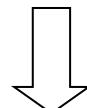


Specification

5.5. Mapping Data into the Image Table

- **Input Module Data**

Analog Input Ch0
Analog Input Ch1
Analog Input Ch2
Analog Input Ch3



- **Input Image Value**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0				Analog Input Ch0 Low byte				
Byte 1				Analog Input Ch0 High byte				
Byte 2				Analog Input Ch1 Low byte				
Byte 3				Analog Input Ch1 High byte				
Byte 4				Analog Input Ch2 Low byte				
Byte 5				Analog Input Ch2 High byte				
Byte 6				Analog Input Ch3 Low byte				
Byte 7				Analog Input Ch3 High byte				

Specification**6. Input Range Setting & Conversion Time Setting****6.1. GT-3914, GT-3934**

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0								Ch#0 Command(H00 : 0~20mA, H01 : 4~20mA, H02 : -20~20mA)
1								Ch#1 Command(H00 : 0~20mA, H01 : 4~20mA, H02 : -20~20mA)
2								Ch#2 Command(H00 : 0~20mA, H01 : 4~20mA, H02 : -20~20mA)
3								Ch#3 Command(H00 : 0~20mA, H01 : 4~20mA, H02 : -20~20mA)
4								Filter Time(H00 : Default Filter(=20), H01 : Fastest ~ H62 : Slowest)
5								Reserve

* ID_PARAMETER (6Byte)

6.2. GT-3924, GT-3944

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0								Ch#0 Command(H00 : 0~10V, H01 : 0~5V, H02 : -10~10V, H03 : -5~5V)
1								Ch#1 Command(H00 : 0~10V, H01 : 0~5V, H02 : -10~10V, H03 : -5~5V)
2								Ch#2 Command(H00 : 0~10V, H01 : 0~5V, H02 : -10~10V, H03 : -5~5V)
3								Ch#3 Command(H00 : 0~10V, H01 : 0~5V, H02 : -10~10V, H03 : -5~5V)
4								Filter Time(H00 : Default Filter(=20), H01 : Fastest ~ H62 : Slowest)
5								Reserve

* ID_PARAMETER (6Byte)