Unitronics Remote I/O

Communication Appendix

Revision 4.A
November, 2021

Contents

URB-TCP (URB-TCP) – Communication Coupler

1. Specifications

Items	Specification
Adapter Type	Slave node (MODBUS TCP/UDP Server)
Protocols	MODBUS TCP/UDP, HTTP, DHCP
Sub-Protocol	Ethernet/IP
Max. Data Size(Input + Output)	Max 128 bytes each slot

MODBUS Interface Register Map = Supported Function Codes

Start Address	Read/Write	Description	Function Code
0x0000 ~	Read	Process input image registers (Real Input Register)	3,4,23
0x0800 ~	Read/Write	Process output image registers (Real Output Register)	3,16,23
0x1000 *	Read	Adapter Identification special registers.	3,4,23
0x1020 *	Read/Write	Adapter Watchdog, other time special register.	3,4,6,16,23
0x1100 *	Read/Write	Adapter Information special registers.	3,4,6,16,23
0x2000 *	Read/Write	Expansion Slot Information special registers.	3,4,6,16,23

MODBUS Interface Bit Map = Supported Function Codes

Start Address	Read/Write	Description	Function Code
0x0000~	Read	Process input image bits All input registers area are addressable by bit address. Size of input image bit is size of input image register * 16.	2
0x1000~	Read/Write	Process output image bits All output registers area are addressable by bit address. Size of output image bit is size of output image register * 16.	1,5,15

Example for system Configuration

Slot Address	Module Description
#0	Coupler
#1	8-discrete input
#2	8-discrete input
#3	4-analog input
#4	16-discrete input
#5	8-discrete input
#6	8-discrete input
#7	8-discrete input
#8	16-discrete input
#9	8-discrete input
#10	8-discrete output
#11	8-discrete output
#12	4-analog output
#13	4- relay output
#14	4-relay output
#15	8-discrete output
#16	8-discrete output
#17	4-analog output
#18	4-relay output
#19	16-discrete output

Input Process Image

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Input 8 pts (Slot#1)							
1	Discrete Input 8 pts (Slot#2)							
2	Analog Input Ch0 low byte (Slot#3)							
3	Analog Input Ch0 high byte (Slot#3)							
4	Analog Input Ch1 low byte (Slot#3)							
5	Analog Input Ch1 high byte (Slot#3)							
6	Analog Input Ch2 low byte (Slot#3)							
7	Analog Input Ch2 high byte (Slot#3)							
8	Analog Input Ch3 low byte (Slot#3)							
9	Analog Input Ch3 high byte (Slot#3)							
10	Discrete Input 8 pts (Slot#4)							
11	Discrete Input 8 pts (Slot#4)							
12	Discrete Input 8 pts (Slot#5)							
13	Discrete Input 8 pts (Slot#6)							
14	Discrete Input 8 pts (Slot#7)							
15	Discrete Input 8 pts (Slot#8)							
16	Discrete Input 8 pts (Slot#8)							
17	Discrete Input 8 pts (Slot#9)							

Output Process Image

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Discrete Output 8 pts (Slot#1)							
1	Discrete Output 8 pts (Slot#2)							
2	Analog Output Ch0 low byte (Slot#3)							
3	Analog Output Ch0 high byte (Slot#3)							
4	Analog Output Ch1 low byte (Slot#3)							
5	Analog Output Ch1 high byte (Slot#3)							
6	Analog Output Ch2 low byte (Slot#3)							
7	Analog Output Ch2 high byte (Slot#3)							
8	Analog Output Ch3 low byte (Slot#3)							
9	Analog Output Ch3 high byte (Slot#3)							
10	Discrete Output low 4 pts (Slot#4)							
12	Discrete Output low 4 pts (Slot#5)							
13	Discrete Output low 8 pts (Slot#6)							
14	Discrete Output low 8 pts (Slot#7)							
15	Analog Output Ch0 low byte (Slot#8)							
16	Analog Output Ch0 high byte (Slot#8)							
17	Analog Output Ch1 low byte (Slot#8)							
18	Analog Output Ch1 high byte (Slot#8)							
19	Analog Output Ch2 low byte (Slot#8)							
20	Analog Output Ch2 high byte (Slot#8)							
21	Analog Output Ch3 low byte (Slot#8)							
22	Analog Output Ch3 high byte (Slot#8)							
24	Discrete Output low 8 pts (Slot#9)							
25	Discrete Output low 8 pts (Slot#10)							
26	Discrete Output high 8 pts (Slot#10)							

2. Configuration Parameters Mapping

Coupler identification special register

Address	Access	Type, Size	Description
0x1000(4096)	Read	1word	Vendor ID
0x1001(4097)	Read	1word	Device type = 0x000C, Network Adapter
0x1002(4098)	Read	1word	Product Code
0x1003(4099)	Read	1word	Firmware revision, if 0x0101, revision 1.01
0x1004(4100)	Read	2word	Product unique serial number
0x1005(4101)	Read	String Up to 34 bytes	Product name string (ASCII)
0x1006(4102)	Read	1word	Sum check of EEPROM
0x1010(4112)	Read	2word	Firmware release date
0x1011(4113)	Read	2word	Product manufacturing inspection date
0x101E(4126)	Read	 7word - 1word - 1word - 1word - 1word - 2word 15word - 2word - 2word - 2word - 3word - 1word - 1word - 1word - 1word - 2word	Composite Id of following address * RTU mode 0x1100(4352), Modbus RS232 Node. (Fixed 0x0001) 0x1000(4096), Vendor ID 0x1001(4097), Device type 0x1002(4098), Product code 0x1003(4099), Firmware revision 0x1004(4100), Product serial number *TCP mode 0x1050(4176), IP address 0x1051(4177), Subnet mask 0x1052(4178), Gateway 0x1053(4179), Ethernet physical address (MAC ID) 0x1000(4096), Vendor ID 0x1001(4097), Device type 0x1002(4098), Product code 0x1003(4099), Firmware revision 0x1004(4100), Product serial number

Coupler timers special register

A watchdog timer can be configured for timeout periods up to 65535(1unit=100msec). The Watchdog timer will timeout (timer decreased, reached 0) if Modbus operation to the slave node does not occur over the configured watchdog value, then the slave adapter forces that slot output value is automatically set to user-configured fault actions and values.

Address	Access	Type, Size	Description
0x1020(4128)	Read/Write	1word	Watchdog time value 16bit unsigned. The time value is represented by multiples of 100msec. The 0 (watchdog timeout disabled) is default value. A changing of watchdog time value resets watchdog error and counter.
0x1021(4129)	Read	1word	Watchdog timer remain value This value is decreased every 100msec
0x1022(4130)	Read	1word	Watchdog error counter, it is cleared by writing address 0x1020
0x1023(4131)	Read/Write	1word	Enable/disable auto recovery Watchdog error when receiving new frame. 0=Disable, 1=Enable(default).
0x1028(4136)	Read	1word	Internal I/O update time, main loop time. (1usec unit)

Coupler Ethernet and TCP/IP special register

Address	Access	Type, Size	Description
0x1040(4160)	Read	1word	Reserved
0x1041(4161)	Read/Write	1word	MODBUS/TCP connection timeout time. (0.5sec unit) Maximum time of Modbus connection to stay to be opened without receiving a Modbus communication request. Leagel Vaules: 0~3600 The 120 (60sec) is default value. The value 0 disables connection time out specially.
0x1042(4162)	Read	1word	Number of Modbus/TCP concurrent connections
0x1043(4163)	Read	1word	Modbus/TCP port, fixed 502
0x1044(4164)	Read	1word	Ethernet Interface Speed, 10(10Mbps) or 100(100Mbps)
0x1045(4165)	Read/Write	1word	IP Setting Method. 0: BOOTP, 1:DHCP Power on required to apply new seetings.
0x1046(4166)	---	---	Reserved.
0x1047(4167)	Read	1word	Status of DIP Pole #9 DHCP/BOOTP(Enable/Disable). 0 : OFF, 1 : ON
0x1048(4168)	Read	1word	Enable/disable Lowest IP address via DIP Switch, 1:Enabled
0x1050(4176)	Read/Write	2word	IP address. If 192.168.123.1, then 0xA8C0, 0x017B. After update this value, IP address, Subnet mask and Gateway are applied as new one.
0x1051(4177)	Read/Write	2word	Subnet mask. If 255.255.255.0, then 0xFFFF, 0x00FF.
0x1052(4178)	Read/Write	2word	Gateway. If 192.168.123.254, then 0xA8C0, 0xFE7B.
0x1053(4179)	Read	3word	Ethernet physical address (MAC-ID). If 11-22-33-44-55-66, then 0x2211, 0x4433, 0x6655.

Coupler information special register

<table>
<tr><th>Address</th><th>Access</th><th>Type, Size</th><th>Description</th></tr>
<tr><td>0x1100(4352)</td><td>Read/Write</td><td>1word</td><td>Master fault action option. (Disable : 0x0000, Enable : 0x0001)
This option can enable Master fault action option.
With master fault action, fault action can be activated with master communication failure. Default is disable.
Power on required to apply new seetings.</td></tr>
<tr><td>0x1102(4354)</td><td>Read</td><td>1word</td><td>Start address of input image word register. =0x0000</td></tr>
<tr><td>0x1103(4355)</td><td>Read</td><td>1word</td><td>Start address of output image word register. =0x0800</td></tr>
<tr><td>0x1104(4356)</td><td>Read</td><td>1word</td><td>Size of input image word register.</td></tr>
<tr><td>0x1105(4357)</td><td>Read</td><td>1word</td><td>Size of output image word register.</td></tr>
<tr><td>0x1106(4358)</td><td>Read</td><td>1word</td><td>Start address of input image bit. = 0x0000</td></tr>
<tr><td>0x1107(4359)</td><td>Read</td><td>1word</td><td>Start address of output image bit. =0x1000</td></tr>
<tr><td>0x1108(4360)</td><td>Read</td><td>1word</td><td>Size of input image bit.</td></tr>
<tr><td>0x1109(4361)</td><td>Read</td><td>1word</td><td>Size of output image bit.</td></tr>
<tr><td>0x110A(4362)</td><td>Read</td><td>1word</td><td>Update time for cyclic data change (same as 0x1028)</td></tr>
<tr><td>0x110D(4365)</td><td>Read</td><td>1word</td><td>Current Dip Switch State and Field Power Status (MSB)
ex) DHCP/BOOTP enable, DiP SW(0x01), Field Power On = 0x8101</td></tr>
<tr><td>0x110E(4366)</td><td>Read</td><td>upto 33word</td><td>Expansion slot’s number including coupler
First 1 word is coupler’s number</td></tr>
<tr><td>0x1110(4368)</td><td>Read</td><td>1word</td><td>Number of expansion slot</td></tr>
<tr><td>0x1113(4371)</td><td>Read</td><td>upto 33word</td><td>Expansion slot Module Id.
First 1word is adapter’s module id.</td></tr>
<tr><td>0x1119(4377)</td><td>Read</td><td>1word</td><td>Hi byte is Modbus status, low byte is internal bus status.
Zero value means ‘no error’.
<table>
<tr><th>Modbus status</th><th>Internal bus status</th></tr>
<tr><td>0x00 : No Error
0x01 : ERR_DIP_SWITCH
0x40 : ERR_CRC_LRC
0x80 : ERR_WATCHDOG</td><td>0x00 : OPERATING
0x02 : CONNECT_FAULT
0x03 : CONFIG_FAULT
0x04 : NO_EXPANSION
0x05 : INVALID_ATTR_VALUE
0x06 : TOO_MUCH_DATA
0x07 : VENDOR_ERROR
0x08 : NOT_EXPECTED_SLOT
0x09 : CRC_ERROR</td></tr>
</table></td></tr>
<tr><td>0x111D(4381)</td><td>Read</td><td>1word</td><td>Coupler Revision.</td></tr>
</table>

URD-0800 (DI08) - 8 Channels universal inputs (sink or source)

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Input Filter value : 0 ~ 10 (unit : ms)							
Byte1	Reserved							

URA-0400O (AI04O) - 4 Channels Analog inputs

1. Process Data Mapping

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							

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Channel 0 (H00: 0~20mA, H01: 4~20mA)							
Byte 1	Current Range for Channel 1 (H00: 0~20mA, H01: 4~20mA)							
Byte 2	Current Range for Channel 2 (H00: 0~20mA, H01: 4~20mA)							
Byte 3	Current Range for Channel 3 (H00: 0~20mA, H01: 4~20mA)							
Byte 4	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)							
Byte 5	Not used(=00)							

URA-0800O (AI08O) - 8 Channels Analog inputs

1. **Process Data Mapping**

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Channel 0 (H00: 0~20mA, H01: 4~20mA)							
Byte 1	Current Range for Channel 1 (H00: 0~20mA, H01: 4~20mA)							
Byte 2	Current Range for Channel 2 (H00: 0~20mA, H01: 4~20mA)							
Byte 3	Current Range for Channel 3 (H00: 0~20mA, H01: 4~20mA)							
Byte 4	Current Range for Channel 4 (H00: 0~20mA, H01: 4~20mA)							
Byte 5	Current Range for Channel 5 (H00: 0~20mA, H01: 4~20mA)							
Byte 6	Current Range for Channel 6 (H00: 0~20mA, H01: 4~20mA)							
Byte 7	Current Range for Channel 7 (H00: 0~20mA, H01: 4~20mA)							
Byte 8	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)							
Byte 9	Not used(=00)							

URA-0400P (AI04P) - 4 Channels Analog inputs

1. Process Data Mapping

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							

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Channel 0 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 1	Current Range for Channel 1 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc))							
Byte 2	Current Range for Channel 2 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 3	Current Range for Channel 3 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 4	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)							
Byte 5	Not used(=00)							

URA-0800P (AI08P) - 8 Channels Analog inputs

1. **Process Data Mapping**

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Channel 0 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 1	Current Range for Channel 1 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc))							
Byte 2	Current Range for Channel 2 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 3	Current Range for Channel 3 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 4	Current Range for Channel 4 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 5	Current Range for Channel 5 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 6	Current Range for Channel 6 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 7	Current Range for Channel 7 (H00: 0~10Vdc, H01: 0~5Vdc, H02: 1~5Vdc)							
Byte 8	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)							
Byte 9	Not used(=00)							

URA-0400T (AI04T) - 4 Analog Current Inputs 16bit

1. Process Data Mapping

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							

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Input 0 (H00: 0~20mA, H01: 4~20mA)							
Byte 1	Current Range for Input 1 (H00: 0~20mA, H01: 4~20mA)							
Byte 2	Current Range for Input 2 (H00: 0~20mA, H01: 4~20mA)							
Byte 3	Current Range for Input 3 (H00: 0~20mA, H01: 4~20mA)							
Byte 4	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)							
Byte 5	Not used(=00)							

URA-0400U (AI04U) - 4 Analog Voltage Inputs 16bit

1. **Process Data Mapping**

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							

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Inputs 0 (H00: 0~10 VDC, H01: 0~5 VDC, H02: 1~5VDC)							
Byte 1	Current Range for Inputs 1 (H00: 0~10 VDC, H01: 0~5 VDC, H02: 1~5VDC)							
Byte 2	Current Range for Inputs 2 (H00: 0~10 VDC, H01: 0~5 VDC, H02: 1~5VDC)							
Byte 3	Current Range for Inputs 3 (H00: 0~10 VDC, H01: 0~5 VDC, H02: 1~5VDC)							
Byte 4	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)							
Byte 5	Not used(=00)							

URD-0004RH (DO04RH) - 4 Channels relay outputs

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0

2. Configuration Parameters Mapping

Offset	Decimal Bit	Description	Default Value
0	00-03	Fault Action(0~3) 0 : Fault Value, 1 : Hold last state	0 (Fault Value)
1	00-03	Fault Value (0~3) 0 : off, 1 : on	0 (off)

URD-0008NH (DO08NH) - 8 Channels Digital output (sink)

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	D7	D6	D5	D4	D3	D2	D1	D0

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault value (ch0~ch7) 0:Off, 1:On							

URD-0008CH (DO08CH) - 8 Channels Digital output (source)

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault value (ch0~ch7) 0:Off, 1:On							

URA-0004W (AO04W) - 4 Channels Analog Outputs

1. Process Data Mapping

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

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for channel 3		Fault Action for channel 2		Fault Action for channel 1		Fault Action for channel 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Not used							
Byte2	Fault Value Low Byte							
Byte3	Not used						Fault Value High Byte	

URA-0008W (AO08W) - 8 Channels Analog Outputs

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch0 Low byte							
Byte 1	Analog Output Ch0 High byte							
Byte 2	Analog Output Ch1 Low byte							
Byte 3	Analog Output Ch1 High byte							
Byte 4	Analog Output Ch2 Low byte							
Byte 5	Analog Output Ch2 High byte							
Byte 6	Analog Output Ch3 Low byte							
Byte 7	Analog Output Ch3 High byte							
Byte 8	Analog Output Ch4 Low byte							
Byte 9	Analog Output Ch4 High byte							
Byte 10	Analog Output Ch5 Low byte							
Byte 11	Analog Output Ch5 High byte							
Byte 12	Analog Output Ch6 Low byte							
Byte 13	Analog Output Ch6 High byte							
Byte 14	Analog Output Ch7 Low byte							
Byte 15	Analog Output Ch7 High byte							

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for channel 3		Fault Action for channel 2		Fault Action for channel 1		Fault Action for channel 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Fault Action for channel 7		Fault Action for channel 6		Fault Action for channel 5		Fault Action for channel 4	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte2	Fault Value Low Byte							
Byte3	Not used				Fault Value High Byte			

URA-0004X (AO04X) - 4 Channels Analog Outputs

1. **Process Data Mapping**

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

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for channel 3		Fault Action for channel 2		Fault Action for channel 1		Fault Action for channel 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Not used							
Byte2	Fault Value Low Byte							
Byte3	Not used				Fault Value High Byte			

URA-0008X (AO08X) - 8 Analog Voltage Outputs 12bit

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch0 Low byte							
Byte 1	Analog Output Ch0 High byte							
Byte 2	Analog Output Ch1 Low byte							
Byte 3	Analog Output Ch1 High byte							
Byte 4	Analog Output Ch2 Low byte							
Byte 5	Analog Output Ch2 High byte							
Byte 6	Analog Output Ch3 Low byte							
Byte 7	Analog Output Ch3 High byte							
Byte 8	Analog Output Ch4 Low byte							
Byte 9	Analog Output Ch4 High byte							
Byte 10	Analog Output Ch5 Low byte							
Byte 11	Analog Output Ch5 High byte							
Byte 12	Analog Output Ch6 Low byte							
Byte 13	Analog Output Ch6 High byte							
Byte 14	Analog Output Ch7 Low byte							
Byte 15	Analog Output Ch7 High byte							

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for output 3		Fault Action for output 2		Fault Action for output 1		Fault Action for output 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Fault Action for output 7		Fault Action for output 6		Fault Action for output 5		Fault Action for output 4	
Byte2	Fault Value Low Byte							
Byte3	Not used				Fault Value High Byte			

URA-0004Y (AO04Y) - 4 Analog Current Outputs 16bit

1. **Process Data Mapping**

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

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for output 3		Fault Action for output 2		Fault Action for output 1		Fault Action for output 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Not used							
Byte2	Fault Value Low Byte							
Byte3	Not used				Fault Value High Byte			

URA-0004Z (AO04Z) - 4 Analog Voltage Outputs 16bit

1. Process Data Mapping

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

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for output 3		Fault Action for output 2		Fault Action for output 1		Fault Action for output 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Not used							
Byte2	Fault Value Low Byte							
Byte3	Not used				Fault Value High Byte			

URD-1600-8 (DI168) – 16 Digital Inputs (SINK / SOURCE)

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8

2. Configuration Parameters Mapping

Bit No	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
Byte0	Input Filter value : 0 ~ 10 (unit : ms)							
Byte1	Reserved							

URD-3200-4 (DI324) – 32 Digital Inputs (SINK / SOURCE)

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8
Byte2	D23	D22	D21	D20	D19	D18	D17	D16
Byte3	D31	D30	D29	D28	D27	D26	D25	D24

2. Configuration Parameters Mapping

Bit No	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
Byte0	Input Filter value : 0 ~ 10 (unit : ms)							
Byte1	Reserved							

URD-0004B (DI04B) - 4 Digital Inputs 120V

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0

URD-0004C (DI04C) - 4 Digital Inputs 240V

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0

URD-0004SK (DO04SK) – 4 Channels Solid State Relay 240V Outputs

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0

2. **Configuration Parameters Mapping**

Offset	Decimal Bit	Description	Default Value
0	00-03	Fault Action(0~3) 0 : Fault Value, 1 : Hold last state	0 (Fault Value)
1	00-03	Fault Value (0~3) 0 : off, 1 : on	0 (off)

URD-0004SM (DO04SM) – 4 Channels Solid State Relay 110V Outputs

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0

2. Configuration Parameters Mapping

Offset	Decimal Bit	Description	Default Value
0	00-03	Fault Action(0~3) 0 : Fault Value, 1 : Hold last state	0 (Fault Value)
1	00-03	Fault Value (0~3) 0 : off, 1 : on	0 (off)

URD-0004SN (DO04SN) – 4 Channels Solid State Relay 24V Outputs

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Reserved				D3	D2	D1	D0

2. **Configuration Parameters Mapping**

Offset	Decimal Bit	Description	Default Value
0	00-03	Fault Action(0~3) 0 : Fault Value, 1 : Hold last state	0 (Fault Value)
1	00-03	Fault Value (0~3) 0 : off, 1 : on	0 (off)

URD-0200E (DI02E) – 2 High Speed Counters / Encoder 24V

1. Process Data Mapping (Inputs)

Counter value represents counter, frequency (Hz), pulse width (0.1usec) or pulse period (0.1usec).

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter Value Ch#0 LL							
1	Counter Value Ch#0 LH							
2	Counter Value Ch#0 HL							
3	Counter Value Ch#0 HH							
4	Counter Value Ch#1 LL							
5	Counter Value Ch#1 LH							
6	Counter Value Ch#1 HL							
7	Counter Value Ch#1 HH							

2. Process Data Mapping (Outputs)

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter Reset ch#0	Counter Stop ch#0	--	--	Count Mode ch#0			
1	Counter Reset ch#1	Counter Stop ch#0	--	--	Count Mode ch#1			

3. Count Mode Ch#0, Ch#1

Count Mode Ch#0, Ch#1

Value	Count Mode	Description
B' 0000 (0x0)	Up	Up Counter - Aph Input acts as Up Clock - Bph Input is not used
B' 0001 (0x1)	Down	Down Counter - Aph Input acts as Down Clock - Bph Input is not used
B' 0010 (0x2)	-	-
B' 0011 (0x3)	-	-
B' 0100 (0x4)	Up Clock & Inhibit	Up Counter with Inhibit - Aph Input acts as Up Clock Input - Bph Input acts as Inhibit function for Up Clock Input
B' 0101 (0x5)	Up Clock & Reset	Up Counter with Reset - Aph Input acts as Up Clock Input - Bph Input acts as Reset function to Counter
B' 0110 (0x6)	Down Clock & Inhibit	Down Counter with Inhibit - Aph Input acts as Down Clock Input - Bph Input acts as Inhibit function for Down Clock Input
B' 0111 (0x7)	Down Clock & Reset	Down Counter with Reset - Aph Input acts as Down Clock Input - Bph Input acts as Reset function to Counter
B' 1000 (0x8)	Up Clock & Down Clock	Up & Down Counter - Aph Input acts as Up Clock Input - Bph Input acts as Down Clock Input
B' 1001 (0x9)	Clock & Direction	Up & Down with Direction - Aph Input acts as Clock Input - Bph Input acts as Direction Input (Low = Up Count, High = Down Count)
B' 1010 (0xA)	Encoder 1x (*1)	Encoder 1x - Frequency Range of the Encoder x1 mode (0x0A) is the same as the counting mode. (Possible Frequency ~300kHz) (*1) - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1011 (0xB)	Encoder 2x	Encoder 2x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1100 (0xC)	Encoder 4x	Encoder 4x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1101 (0xD)	Frequency Measurement (*2) 1 sec Update	Simple Frequency Measurement, updated by 1sec, Hz Unit - Frequency, B`1101 (0xD) can`t be used with other channel`s Count Mode = 0x0, 0x1, 0x4 ~ 0xA (*2) - Aph Input acts as Frequency Input - Bph Input is not used
B' 1110 (0xE)	Pulse Width Measurement(*3)	Simple Pulse Width Measurement, 0.1usec Unit - Pulse Width(32bit), if 1234, then Pulse High(On) width is

		123.4usec (*3) - Aph Input acts as Pulse Input - Bph Input is not used
B′ 1111 (0xF)	Pulse Width & Period Measurement(*4)	Simple Pulse Width & Period Measurement, 0.1usec Unit, - Available in case of Pulse Input >= 200Hz(<= 2.5msec, Pulse On Width) - Pulse Width(16bit, Low Word) + Pulse Period(16bit, High Word) (*4) - Aph Input acts as Pulse Input - Bph Input is not used

- Frequency Range of the Encoder x1 mode is the same as the counting mode.

- Frequency, B′1101(0xD) can′t be used with other channel′s Count Mode = 0x0, 0x1, 0x4 ~ 0x9

- Pulse Width, B′1110(0xE) measures Aph Input′s High(On) Pulse Width(32bit) in 0.1usec unit.

- Pulse Width & Period, B′1111(0xF) measures Aph′s Pulse High(On) Width(16bit) & Period(16bit) in 0.1usec unit.

This encoder mode is perfectly same with mode B’0000, B’0001. This is for using Encoder module easily.

Frequency, B’1100(0xC) and B’1101(0xD) can’t be used with other channel’s Count Mode = 0x2 ~ 0x9

Pulse Width, B’1110(0xE) measures “A phase” Input’s High (On) Pulse Width (32bit) in 0.1usec unit.

Pulse Width & Period, B’1111(0xF) measures “A phase” Pulse High (On) Width (16bit) & Period (16bit) in 0.1usec unit.

URD-0200D (DI02D) – 2 High Speed Counters / Encoder 5V

1. **Process Data Mapping (Inputs)**

Counter value represents counter, frequency (Hz), pulse width (0.1usec) or pulse period (0.1usec).

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter Value Ch#0 LL							
1	Counter Value Ch#0 LH							
2	Counter Value Ch#0 HL							
3	Counter Value Ch#0 HH							
4	Counter Value Ch#1 LL							
5	Counter Value Ch#1 LH							
6	Counter Value Ch#1 HL							
7	Counter Value Ch#1 HH							

2. **Process Data Mapping (Outputs)**

Byte	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0	Counter Reset ch#0	Counter Stop ch#0	--	--	Count Mode ch#0			
1	Counter Reset ch#1	Counter Stop ch#0	--	--	Count Mode ch#1			

3. Count Mode Ch#0, Ch#1

Count Mode Ch#0, Ch#1

Value	Count Mode	Description
B' 0000 (0x0)	Up	Up Counter - Aph Input acts as Up Clock - Bph Input is not used
B' 0001 (0x1)	Down	Down Counter - Aph Input acts as Down Clock - Bph Input is not used
B' 0010 (0x2)	-	-
B' 0011 (0x3)	-	-
B' 0100 (0x4)	Up Clock & Inhibit	Up Counter with Inhibit - Aph Input acts as Up Clock Input - Bph Input acts as Inhibit function for Up Clock Input
B' 0101 (0x5)	Up Clock & Reset	Up Counter with Reset - Aph Input acts as Up Clock Input - Bph Input acts as Reset function to Counter
B' 0110 (0x6)	Down Clock & Inhibit	Down Counter with Inhibit - Aph Input acts as Down Clock Input - Bph Input acts as Inhibit function for Down Clock Input
B' 0111 (0x7)	Down Clock & Reset	Down Counter with Reset - Aph Input acts as Down Clock Input - Bph Input acts as Reset function to Counter
B' 1000 (0x8)	Up Clock & Down Clock	Up & Down Counter - Aph Input acts as Up Clock Input - Bph Input acts as Down Clock Input
B' 1001 (0x9)	Clock & Direction	Up & Down with Direction - Aph Input acts as Clock Input - Bph Input acts as Direction Input (Low = Up Count, High = Down Count)
B' 1010 (0xA)	Encoder 1x (*1)	Encoder 1x - Frequency Range of the Encoder x1 mode (0x0A) is the same as the counting mode. (Possible Frequency ~300kHz) (*1) - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1011 (0xB)	Encoder 2x	Encoder 2x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1100 (0xC)	Encoder 4x	Encoder 4x - Aph Input acts as Encoder's A phase Input - Bph Input acts as Encoder's B phase Input
B' 1101 (0xD)	Frequency Measurement (*2) 1 sec Update	Simple Frequency Measurement, updated by 1sec, Hz Unit - Frequency, B`1101 (0xD) can`t be used with other channel`s Count Mode = 0x0, 0x1, 0x4 ~ 0xA (*2) - Aph Input acts as Frequency Input - Bph Input is not used
B' 1110 (0xE)	Pulse Width Measurement(*3)	Simple Pulse Width Measurement, 0.1usec Unit - Pulse Width(32bit), if 1234, then Pulse High(On) width is

		123.4usec (*3) - Aph Input acts as Pulse Input - Bph Input is not used
B′ 1111 (0xF)	Pulse Width & Period Measurement(*4)	Simple Pulse Width & Period Measurement, 0.1usec Unit, - Available in case of Pulse Input >= 200Hz(<= 2.5msec, Pulse On Width) - Pulse Width(16bit, Low Word) + Pulse Period(16bit, High Word) (*4) - Aph Input acts as Pulse Input - Bph Input is not used

- Frequency Range of the Encoder x1 mode is the same as the counting mode.

- Frequency, B′1101(0xD) can′t be used with other channel′s Count Mode = 0x0, 0x1, 0x4 ~ 0x9

- Pulse Width, B′1110(0xE) measures Aph Input′s High(On) Pulse Width(32bit) in 0.1usec unit.

- Pulse Width & Period, B′1111(0xF) measures Aph′s Pulse High(On) Width(16bit) & Period(16bit) in 0.1usec unit.

This encoder mode is perfectly same with mode B’0000, B’0001. This is for using Encoder module easily.

Frequency, B’1100(0xC) and B’1101(0xD) can’t be used with other channel’s Count Mode = 0x2 ~ 0x9

Pulse Width, B’1110(0xE) measures “A phase” Input’s High (On) Pulse Width (32bit) in 0.1usec unit.

Pulse Width & Period, B’1111(0xF) measures “A phase” Pulse High (On) Width (16bit) & Period (16bit) in 0.1usec unit.

URD-0008CI (DO08CI) - 8 Channels Digital output (source)

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault value (ch0~ch7) 0:Off, 1:On							

URD-0008NI (DO08NI) - 8 Channels Digital output (sink)

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault value (ch0~ch7) 0:Off, 1:On							

URD-0016CG-8 (DO16C8) - 16 Channels Digital output (source)

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault Action (ch8~ch15) 0: Fault value, 1:Hold last state							
Byte2	Fault value (ch0~ch7) 0:Off, 1:On							
Byte3	Fault value (ch8~ch15) 0:Off, 1:On							

URD-0016NG-8 (DO16N8) - 16 Channels Digital output (sink)

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8

2. **Configuration Parameters Mapping**

Bit No	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault Action (ch8~ch15) 0: Fault value, 1:Hold last state							
Byte2	Fault value (ch0~ch7) 0:Off, 1:On							
Byte3	Fault value (ch8~ch15) 0:Off, 1:On							

URD-0032NG-4 (DO32N4) - 32 Channels Digital output (sink)

3. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8
Byte2	D23	D22	D21	D20	D19	D18	D17	D16
Byte3	D31	D30	D29	D28	D27	D26	D25	D24

4. Configuration Parameters Mapping

Bit No	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault Action (ch8~ch15) 0: Fault value, 1:Hold last state							
Byte2	Fault Action (ch16~ch23) 0: Fault value, 1:Hold last state							
Byte3	Fault Action (ch24~ch31) 0: Fault value, 1:Hold last state							
Byte4	Fault value (ch0~ch7) 0:Off, 1:On							
Byte5	Fault value (ch8~ch15) 0:Off, 1:On							
Byte6	Fault value (ch16~ch23) 0:Off, 1:On							
Byte7	Fault value (ch14~ch31) 0:Off, 1:On							

URD-0032CG-4 (DO32C4) - 32 Channels Digital output (source)

1. **Process Data Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	D7	D6	D5	D4	D3	D2	D1	D0
Byte1	D15	D14	D13	D12	D11	D10	D9	D8
Byte2	D23	D22	D21	D20	D19	D18	D17	D16
Byte3	D31	D30	D29	D28	D27	D26	D25	D24

2. **Configuration Parameters Mapping**

Bit No	**Bit7**	**Bit6**	**Bit5**	**Bit4**	**Bit3**	**Bit2**	**Bit1**	**Bit0**
Byte0	Fault Action (ch0~ch7) 0: Fault value, 1:Hold last state							
Byte1	Fault Action (ch8~ch15) 0: Fault value, 1:Hold last state							
Byte2	Fault Action (ch16~ch23) 0: Fault value, 1:Hold last state							
Byte3	Fault Action (ch24~ch31) 0: Fault value, 1:Hold last state							
Byte4	Fault value (ch0~ch7) 0:Off, 1:On							
Byte5	Fault value (ch8~ch15) 0:Off, 1:On							
Byte6	Fault value (ch16~ch23) 0:Off, 1:On							
Byte7	Fault value (ch14~ch31) 0:Off, 1:On							

URA-1600O-8 (AI16O8) - 16 Channels Analog Input Current

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							
Byte 16	Analog Input Ch8 Low byte							
Byte 17	Analog Input Ch8 High byte							
Byte 18	Analog Input Ch9 Low byte							
Byte 19	Analog Input Ch9 High byte							
Byte 20	Analog Input Ch10 Low byte							
Byte 21	Analog Input Ch10 High byte							
Byte 22	Analog Input Ch11 Low byte							
Byte 23	Analog Input Ch11 High byte							
Byte 24	Analog Input Ch12 Low byte							
Byte 25	Analog Input Ch12 High byte							
Byte 26	Analog Input Ch13 Low byte							
Byte 27	Analog Input Ch13 High byte							
Byte 28	Analog Input Ch14 Low byte							
Byte 29	Analog Input Ch14 High byte							
Byte 30	Analog Input Ch15 Low byte							
Byte 31	Analog Input Ch15 High byte							

1. **Process Data Mapping**

2. **Configuration Parameters Mapping**

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Channel 0 (H00: 0~20mA, H01: 4~20mA)							
Byte 1	Current Range for Channel 1 (H00: 0~20mA, H01: 4~20mA)							
Byte 2	Current Range for Channel 2 (H00: 0~20mA, H01: 4~20mA)							
Byte 3	Current Range for Channel 3 (H00: 0~20mA, H01: 4~20mA)							
Byte 4	Current Range for Channel 4 (H00: 0~20mA, H01: 4~20mA)							

Byte 5	Current Range for Channel 5 (H00: 0~20mA, H01: 4~20mA)
Byte 6	Current Range for Channel 6 (H00: 0~20mA, H01: 4~20mA)
Byte 7	Current Range for Channel 7 (H00: 0~20mA, H01: 4~20mA)
Byte 8	Current Range for Channel 8 (H00: 0~20mA, H01: 4~20mA)
Byte 9	Current Range for Channel 9 (H00: 0~20mA, H01: 4~20mA)
Byte 10	Current Range for Channel 10 (H00: 0~20mA, H01: 4~20mA)
Byte 11	Current Range for Channel 11 (H00: 0~20mA, H01: 4~20mA)
Byte 12	Current Range for Channel 12 (H00: 0~20mA, H01: 4~20mA)
Byte 13	Current Range for Channel 13 (H00: 0~20mA, H01: 4~20mA)
Byte 14	Current Range for Channel 14 (H00: 0~20mA, H01: 4~20mA)
Byte 15	Current Range for Channel 15 (H00: 0~20mA, H01: 4~20mA)
Byte 16	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)
Byte 17	Not used(=00)

URA-1600P-8 (AI16P8) - 16 Channels Analog Input Voltage

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							
Byte 16	Analog Input Ch8 Low byte							
Byte 17	Analog Input Ch8 High byte							
Byte 18	Analog Input Ch9 Low byte							
Byte 19	Analog Input Ch9 High byte							
Byte 20	Analog Input Ch10 Low byte							
Byte 21	Analog Input Ch10 High byte							
Byte 22	Analog Input Ch11 Low byte							
Byte 23	Analog Input Ch11 High byte							
Byte 24	Analog Input Ch12 Low byte							
Byte 25	Analog Input Ch12 High byte							
Byte 26	Analog Input Ch13 Low byte							
Byte 27	Analog Input Ch13 High byte							
Byte 28	Analog Input Ch14 Low byte							
Byte 29	Analog Input Ch14 High byte							
Byte 30	Analog Input Ch15 Low byte							
Byte 31	Analog Input Ch15 High byte							

1. **Process Data Mapping**

2. **Configuration Parameters Mapping**

Bit N	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit
Byte 0	Voltage Range for Channel 0 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 1	Voltage Range for Channel 1 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 2	Voltage Range for Channel 2 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 3	Voltage Range for Channel 3 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 4	Voltage Range for Channel 4 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 5	Voltage Range for Channel 5 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 6	Voltage Range for Channel 6 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 7	Voltage Range for Channel 7 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							

Byte 8	Voltage Range for Channel 8 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 9	Voltage Range for Channel 9 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 10	Voltage Range for Channel 10 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 11	Voltage Range for Channel 11 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 12	Voltage Range for Channel 12 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 13	Voltage Range for Channel 13 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 14	Voltage Range for Channel 14 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 15	Voltage Range for Channel 15 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 16	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)
Byte 17	Not used(=00)

URA-1600T-8 (AI16T8) - 16 Channels Analog Input Current

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							
Byte 16	Analog Input Ch8 Low byte							
Byte 17	Analog Input Ch8 High byte							
Byte 18	Analog Input Ch9 Low byte							
Byte 19	Analog Input Ch9 High byte							
Byte 20	Analog Input Ch10 Low byte							
Byte 21	Analog Input Ch10 High byte							
Byte 22	Analog Input Ch11 Low byte							
Byte 23	Analog Input Ch11 High byte							
Byte 24	Analog Input Ch12 Low byte							
Byte 25	Analog Input Ch12 High byte							
Byte 26	Analog Input Ch13 Low byte							
Byte 27	Analog Input Ch13 High byte							
Byte 28	Analog Input Ch14 Low byte							
Byte 29	Analog Input Ch14 High byte							
Byte 30	Analog Input Ch15 Low byte							
Byte 31	Analog Input Ch15 High byte							

3. Process Data Mapping

4. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Current Range for Channel 0 (H00: 0~20mA, H01: 4~20mA)							
Byte 1	Current Range for Channel 1 (H00: 0~20mA, H01: 4~20mA)							
Byte 2	Current Range for Channel 2 (H00: 0~20mA, H01: 4~20mA)							
Byte 3	Current Range for Channel 3 (H00: 0~20mA, H01: 4~20mA)							
Byte 4	Current Range for Channel 4 (H00: 0~20mA, H01: 4~20mA)							

Byte 5	Current Range for Channel 5 (H00: 0~20mA, H01: 4~20mA)
Byte 6	Current Range for Channel 6 (H00: 0~20mA, H01: 4~20mA)
Byte 7	Current Range for Channel 7 (H00: 0~20mA, H01: 4~20mA)
Byte 8	Current Range for Channel 8 (H00: 0~20mA, H01: 4~20mA)
Byte 9	Current Range for Channel 9 (H00: 0~20mA, H01: 4~20mA)
Byte 10	Current Range for Channel 10 (H00: 0~20mA, H01: 4~20mA)
Byte 11	Current Range for Channel 11 (H00: 0~20mA, H01: 4~20mA)
Byte 12	Current Range for Channel 12 (H00: 0~20mA, H01: 4~20mA)
Byte 13	Current Range for Channel 13 (H00: 0~20mA, H01: 4~20mA)
Byte 14	Current Range for Channel 14 (H00: 0~20mA, H01: 4~20mA)
Byte 15	Current Range for Channel 15 (H00: 0~20mA, H01: 4~20mA)
Byte 16	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)
Byte 17	Not used(=00)

URA-1600U-8 (AI16U8) - 16 Channels Analog Input Voltage

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							
Byte 16	Analog Input Ch8 Low byte							
Byte 17	Analog Input Ch8 High byte							
Byte 18	Analog Input Ch9 Low byte							
Byte 19	Analog Input Ch9 High byte							
Byte 20	Analog Input Ch10 Low byte							
Byte 21	Analog Input Ch10 High byte							
Byte 22	Analog Input Ch11 Low byte							
Byte 23	Analog Input Ch11 High byte							
Byte 24	Analog Input Ch12 Low byte							
Byte 25	Analog Input Ch12 High byte							
Byte 26	Analog Input Ch13 Low byte							
Byte 27	Analog Input Ch13 High byte							
Byte 28	Analog Input Ch14 Low byte							
Byte 29	Analog Input Ch14 High byte							
Byte 30	Analog Input Ch15 Low byte							
Byte 31	Analog Input Ch15 High byte							

3. Process Data Mapping

4. Configuration Parameters Mapping

Bit N	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit
Byte 0	Voltage Range for Channel 0 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 1	Voltage Range for Channel 1 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 2	Voltage Range for Channel 2 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 3	Voltage Range for Channel 3 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 4	Voltage Range for Channel 4 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 5	Voltage Range for Channel 5 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 6	Voltage Range for Channel 6 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							
Byte 7	Voltage Range for Channel 7 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)							

Byte 8	Voltage Range for Channel 8 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 9	Voltage Range for Channel 9 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 10	Voltage Range for Channel 10 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 11	Voltage Range for Channel 11 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 12	Voltage Range for Channel 12 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 13	Voltage Range for Channel 13 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 14	Voltage Range for Channel 14 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 15	Voltage Range for Channel 15 (H00: 0~10Vdc, H01: 0~5Vdc, H02 : 1~5Vdc)
Byte 16	Filter Time (H00: Default Filter(=20) / H01: Fastest ~ / H62: Slowest)
Byte 17	Not used(=00)

URA-1600X-8 (AI16X8) - 16 Channels Analog Output Voltage

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch0 Low byte							
Byte 1	Analog Output Ch0 High byte							
Byte 2	Analog Output Ch1 Low byte							
Byte 3	Analog Output Ch1 High byte							
Byte 4	Analog Output Ch2 Low byte							
Byte 5	Analog Output Ch2 High byte							
Byte 6	Analog Output Ch3 Low byte							
Byte 7	Analog Output Ch3 High byte							
Byte 8	Analog Output Ch4 Low byte							
Byte 9	Analog Output Ch4 High byte							
Byte 10	Analog Output Ch5 Low byte							
Byte 11	Analog Output Ch5 High byte							
Byte 12	Analog Output Ch6 Low byte							
Byte 13	Analog Output Ch6 High byte							
Byte 14	Analog Output Ch7 Low byte							
Byte 15	Analog Output Ch7 High byte							
Byte 16	Analog Output Ch8 Low byte							
Byte 17	Analog Output Ch8 High byte							
Byte 18	Analog Output Ch9 Low byte							
Byte 19	Analog Output Ch9 High byte							
Byte 20	Analog Output Ch10 Low byte							
Byte 21	Analog Output Ch10 High byte							
Byte 22	Analog Output Ch11 Low byte							
Byte 23	Analog Output Ch11 High byte							
Byte 24	Analog Output Ch12 Low byte							
Byte 25	Analog Output Ch12 High byte							
Byte 26	Analog Output Ch13 Low byte							
Byte 27	Analog Output Ch13 High byte							
Byte 28	Analog Output Ch14 Low byte							
Byte 29	Analog Output Ch14 High byte							
Byte 30	Analog Output Ch15 Low byte							
Byte 31	Analog Output Ch15 High byte							

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for channel 3		Fault Action for channel 2		Fault Action for channel 1		Fault Action for channel 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Fault Action for channel 7		Fault Action for channel 6		Fault Action for channel 5		Fault Action for channel 4	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte2	Fault Action for channel 11		Fault Action for channel 10		Fault Action for channel 9		Fault Action for channel 8	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte3	Fault Action for		Fault Action for		Fault Action for		Fault Action for	

	channel 15	channel 14	channel 13	channel 12
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit			
Byte4	Fault Value Low Byte			
Byte5	Not used		Fault Value High Byte	

URA-1600Z-8 (AI16Z8) - 16 Channels Analog Output Voltage

1. Process Data Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte 0	Analog Output Ch0 Low byte							
Byte 1	Analog Output Ch0 High byte							
Byte 2	Analog Output Ch1 Low byte							
Byte 3	Analog Output Ch1 High byte							
Byte 4	Analog Output Ch2 Low byte							
Byte 5	Analog Output Ch2 High byte							
Byte 6	Analog Output Ch3 Low byte							
Byte 7	Analog Output Ch3 High byte							
Byte 8	Analog Output Ch4 Low byte							
Byte 9	Analog Output Ch4 High byte							
Byte 10	Analog Output Ch5 Low byte							
Byte 11	Analog Output Ch5 High byte							
Byte 12	Analog Output Ch6 Low byte							
Byte 13	Analog Output Ch6 High byte							
Byte 14	Analog Output Ch7 Low byte							
Byte 15	Analog Output Ch7 High byte							
Byte 16	Analog Output Ch8 Low byte							
Byte 17	Analog Output Ch8 High byte							
Byte 18	Analog Output Ch9 Low byte							
Byte 19	Analog Output Ch9 High byte							
Byte 20	Analog Output Ch10 Low byte							
Byte 21	Analog Output Ch10 High byte							
Byte 22	Analog Output Ch11 Low byte							
Byte 23	Analog Output Ch11 High byte							
Byte 24	Analog Output Ch12 Low byte							
Byte 25	Analog Output Ch12 High byte							
Byte 26	Analog Output Ch13 Low byte							
Byte 27	Analog Output Ch13 High byte							
Byte 28	Analog Output Ch14 Low byte							
Byte 29	Analog Output Ch14 High byte							
Byte 30	Analog Output Ch15 Low byte							
Byte 31	Analog Output Ch15 High byte							

2. Configuration Parameters Mapping

Bit No	Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
Byte0	Fault Action for channel 3		Fault Action for channel 2		Fault Action for channel 1		Fault Action for channel 0	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte1	Fault Action for channel 7		Fault Action for channel 6		Fault Action for channel 5		Fault Action for channel 4	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte2	Fault Action for channel 11		Fault Action for channel 10		Fault Action for channel 9		Fault Action for channel 8	
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit							
Byte3	Fault Action for		Fault Action for		Fault Action for		Fault Action for	

	channel 15	channel 14	channel 13	channel 12
	00: Fault Value 01: Hold last state 10: Low Limit 11:High Limit			
Byte4	Fault Value Low Byte			
Byte5	Fault Value High Byte			

URS-04RT (S04RT) – 4 RTD / Resistance

1. Process Data Mapping

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							

2. Configuration Parameters Mapping

Byte	Decimal Bit	Description	Default Value
0	00-07	The selection Sensor Type =00h:PT100, 0.00385, -200~850°C, 0.1°C /count =01h:PT200, 0.00385, -200~850°C, 0.1°C/count =02h:PT500, 0.00385, -200~850°C, 0.1°C/count =03h:PT1000, 0.00385, -200~350°C, 0.1°C/count =04h:PT50, 0.00385, -200~850°C, 0.1°C/count =10h:JPT100, 0.003916, -200~640°C, 0.1°C/count =11h:JPT200, 0.003916, -200~640°C, 0.1°C/count =12h:JPT500, 0.003916, -200~640°C, 0.1°C/count =13h:JPT1000, 0.003916, -200~350°C, 0.1°C/count =14h:JPT50, 0.003916, -200~640°C, 0.1°C/count =20h:NI100, 0.00618, -60~250°C, 0.1°C/count =21h:NI200, 0.00618, -60~250°C, 0.1°C/count =22h:NI500, 0.00618, -60~250°C, 0.1°C/count =23h:NI1000, 0.00618, -60~180°C, 0.1°C/count =30h:NI120, 0.00672, -80~250°C, 0.1°C/count =53h:NI1000LG, 0.00500, -50~120°C, 0.1°C/count =80h:Resistance Input, 1~2000Ω, 100mΩ /1count =81h:Resistance Input, 1~327Ω, 10mΩ /1count =82h:Resistance Input, 1~620Ω, 20mΩ /1count =83h: Resistance Input, 1~1200Ω, 50mΩ/1count =Others: Reserved	0: PT100
1	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	0: Celsius(°C)
	01	Reserved	0
	02	Data Resolution 0: 0.1°C, °F/bit, 1: 1°C, °F/bit	0
	03	Reserved	0
	04	Filter Type 0: Normal Filter, 1: Enhanced Filter	0: Normal Filter
	05-07	Reserved	0
2~3		CH0 Offset value	0
4~5		CH1 Offset value	0
6~7		CH2 Offset value	0
8~9		CH3 Offset value	0

URS-08RT-2 (S08RT2) – 8 RTD / Resistance

1. Process Data Mapping

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							

2. Configuration Parameters Mapping

Byte	Decimal Bit	Description	Default Value
0	00-07	The selection Sensor Type =00h:PT100, 0.00385, -200~850°C, 0.1°C /count =01h:PT200, 0.00385, -200~850°C, 0.1°C/count =02h:PT500, 0.00385, -200~850°C, 0.1°C/count =03h:PT1000, 0.00385, -200~350°C, 0.1°C/count =04h:PT50, 0.00385, -200~850°C, 0.1°C/count =10h:JPT100, 0.003916, -200~640°C, 0.1°C/count =11h:JPT200, 0.003916, -200~640°C, 0.1°C/count =12h:JPT500, 0.003916, -200~640°C, 0.1°C/count =13h:JPT1000, 0.003916, -200~350°C, 0.1°C/count =14h:JPT50, 0.003916, -200~640°C, 0.1°C/count =20h:NI100, 0.00618, -60~250°C, 0.1°C/count =21h:NI200, 0.00618, -60~250°C, 0.1°C/count =22h:NI500, 0.00618, -60~250°C, 0.1°C/count =23h:NI1000, 0.00618, -60~180°C, 0.1°C/count =30h:NI120, 0.00672, -80~250°C, 0.1°C/count =53h:NI1000LG, 0.00500, -50~120°C, 0.1°C/count =80h:Resistance Input, 1~2000Ω, 100mΩ /1count =81h:Resistance Input, 1~327Ω, 10mΩ /1count =82h:Resistance Input, 1~620Ω, 20mΩ /1count =83h: Resistance Input, 1~1200Ω, 50mΩ/1count =Others: Reserved	0: PT100
1	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	0: Celsius(°C)
	01	Reserved	0
	02	Data Resolution 0: 0.1°C, °F/bit, 1: 1°C, °F/bit	0
	03	Reserved	0
	04	Filter Type 0: Normal Filter, 1: Enhanced Filter	0: Normal Filter
	05-07	Reserved	0
2~3		CH0 Offset value	0
4~5		CH1 Offset value	0

6~7		CH2 Offset value	0
8~9		CH3 Offset value	0
10~11		CH4 Offset value	0
12~13		CH5 Offset value	0
14~15		CH6 Offset value	0
16~17		CH7 Offset value	0

URS-04TC (S04TC) – 4 Thermocouple / mV

3. Process Data Mapping

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							

4. Configuration Parameters Mapping

Byte	Decimal Bit	Description	Default Value
0	00-07	The selection **Sensor Type** =00h: Type K, 0.1°C/count =01h: Type J, 0.1°C/count =02h: Type T, 0.1°C/count =03h: Type B, 0.1°C/count =04h: Type R, 0.1°C/count =05h: Type S, 0.1°C/count =06h: Type E, 0.1°C/count =07h: Type N, 0.1°C/count =08h: Type L, 0.1°C/count =09h: Type U, 0.1°C/count =0Ah: Type C, 0.1°C/count =0Bh: Type D, 0.1°C/count =80h: 10uV Input, -81.0~81.0mV, 10uV / 1count =81h: 1uV Input, -32.7~32.7mV, 1uV / 1count =82h: 2uV Input, -65.5~65.5mV, 2uV / 1count =Others: Reserved	00 : Type K
1	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	00 : Celsius(°C) Cold Junction Compensation 0.1℃ Normal Filter
	01*	0: Cold Junction Compensation 1: Disable Cold Junction Compensation	
	02	Data Resolution 0: 0.1℃, ℉/bit, 1: 1℃, ℉/bit	
	03	Reserved	
	04	Filter Type 0: Normal Filter, 1: Enhanced Filter	
	05-07	Reserved	
2	00-07	Internal Cold Junction[1] Offset Data Low Byte	0000
3	00-07	Internal Cold Junction[1] Offset Data High Byte	
4	00-07	Internal Cold Junction[2] Offset Data Low Byte	0000
5	00-07	Internal Cold Junction[2] Offset Data High Byte	
6	00-07	External Cold Junction Offset Data Low Byte	0000
7	00-07	External Cold Junction Offset Data High Byte	

URS-08TC-2 (S08TC2) – 8 Thermocouple / mV

3. Process Data Mapping

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							
Byte 8	Analog Input Ch4 Low byte							
Byte 9	Analog Input Ch4 High byte							
Byte 10	Analog Input Ch5 Low byte							
Byte 11	Analog Input Ch5 High byte							
Byte 12	Analog Input Ch6 Low byte							
Byte 13	Analog Input Ch6 High byte							
Byte 14	Analog Input Ch7 Low byte							
Byte 15	Analog Input Ch7 High byte							

4. Configuration Parameters Mapping

Byte	Decimal Bit	Description	Default Value
0	00-07	The selection **Sensor Type** =00h: Type K, 0.1°C/count =01h: Type J, 0.1°C/count =02h: Type T, 0.1°C/count =03h: Type B, 0.1°C/count =04h: Type R, 0.1°C/count =05h: Type S, 0.1°C/count =06h: Type E, 0.1°C/count =07h: Type N, 0.1°C/count =08h: Type L, 0.1°C/count =09h: Type U, 0.1°C/count =0Ah: Type C, 0.1°C/count =0Bh: Type D, 0.1°C/count =80h: 10uV Input, -81.0~81.0mV, 10uV / 1count =81h: 1uV Input, -32.7~32.7mV, 1uV / 1count =82h: 2uV Input, -65.5~65.5mV, 2uV / 1count =Others: Reserved	00 : Type K
1	00	Temperature Type 0: Celsius(°C), 1: Fahrenheit(°F)	00 : Celsius(°C) Cold Junction Compensation 0.1°C Normal Filter
	01*	0: Cold Junction Compensation 1: Disable Cold Junction Compensation	
	02	Data Resolution 0: 0.1°C, °F/bit, 1: 1°C, °F/bit	
	03	Reserved	
	04	Filter Type 0: Normal Filter, 1: Enhanced Filter	
	05-07	Reserved	
2	00-07	Internal Cold Junction[1] Offset Data Low Byte	0000
3	00-07	Internal Cold Junction[1] Offset Data High Byte	
4	00-07	Internal Cold Junction[2] Offset Data Low Byte	0000

5	00-07	Internal Cold Junction[2] Offset Data High Byte	
6	00-07	External Cold Junction Offset Data Low Byte	0000
7	00-07	External Cold Junction Offset Data High Byte	

Ethernet/IP Support

When using Ethernet/IP only, TCP connection timeout time value should be ‘0’, the ‘0’ value means TCP connection time out is disabled.

Refer to ‘Coupler Ethernet and TCP/IP special register' section.

Supported Objects

Name of Object	Type	Number of Instances	Class Code
Identity	Required	1	01HEX
Message Router	Required	1	02 HEX
Assembly	Required	2	04 HEX
Connection Manager	Required	1	06 HEX
Port	Required	1	F4 HEX
TCP/IP Interface	Required	1	F5 HEX
Ethernet Link	Required	1	F6 HEX
FnBus Manager	Vendor-specific	1	70 HEX
Expansion Slot	Vendor-specific	1~63	71 HEX

1. Identity Object

Class Code: 01HEX

a. Common Services

Service Code	Implemented for		Service Name	Value
	Class	Instance		
0x01	Yes	Yes	Get_Attribute_All	
0x05	No	Yes	Reset	0: Reset Only 1: Reset and Factory Default
0x0E	No	Yes	Get_Attribute_Single	

b. Class Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
0	1	Get	Revision	UINT	0001HEX
	2	Get	Max Instance	UINT	0001HEX
	6	Get	Maximum ID Number Class Attributes	UINT	0000HEX
	7	Get	Maximum ID Number Instance Attributes	UINT	0000HEX

c. Instance Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1	1	Get	Vendor ID	UINT	
	2	Get	Device Type	UINT	0CHEX (Communications Adapter)
	3	Get	Product Code	UINT	
	4	Get	Revision - Major - Minor	Structure of: USINT USINT	 1 ~ 9 1 ~ 255
	5	Get	Status	WORD	Device status. Defined in standard.
	6	Get	Serial Number	UDINT	Unique Number
	7	Get	Product Name - String Length - ASCII String	Short_String USINT STRING	
	Vendor-specific				
	100	Get	Device Fault Code	USINT	00HEX : Normal Operation Bit 0: No expansion slot Bit 1: Too many expansion slot Bit 2: Overflow I/O size Bit 3: I/O Configuration failure Bit 4: EEPROM Checksum fault Bit 6: Invalid Module ID Bit 7: Firmware fault
	104	Get	Firmware Release Date	UDINT	YYYYMMDDHEX

2. Message Router Object

Class Code: 02HEX

a. Common Services

Service Code	Implemented for		Service Name
	Class	Instance	
0x01	Yes	No	Get_Attribute_All
0x0E	No	Yes	Get_Attribute_Single

b. Class Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
0	1	Get	Revision	UINT	0001HEX
	4	Get	Number of Attribute	UINT	0000HEX
	5		Number of Service	UINT	0000HEX
	6	Get	Maximum ID Number Class Attributes	UINT	0000HEX
	7	Get	Maximum ID Number Instance Attributes	UINT	0000HEX

c. Instance Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1	1	Get	Object Class List	STRUCT of UINT Array of UINT	 10DEC 09 00 01 00 02 00 04 00 06 00 F4 00 F5 00 F6 00 70 00 71 00
	2	Get	Number Available	UINT	16DEC Maximum number of connections supported

3. Assembly Object

Class Code: 04 HEX

a. Common Services

Service Code	Implemented for		Service Name
	Class	Instance	
0x0E	Yes	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

b. Class Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
0	1	Get	Revision	UINT	0002HEX

c. Class Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1	3	Get	Input (Produced) Process Image	Array n BYTE	Input process image data

			Data		
2	3	Set/Get	Output (Consumed) Process Image Data	Array n BYTE	Output process image data

4. Connection Manager Object

Class Code: 06HEX

a. Class Attributes, Instance Attribute

None

5. Port Object

Class Code: F4HEX

a. Common Services

Service Code	Implemented for		Service Name
	Class	Instance	
0x01	Yes	Yes	Get_Attribute_All
0x0E	Yes	Yes	Get_Attribute_Single

b. Class Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
0	1	Get	Revision	UINT	0001HEX
	2	Get	Max Instance	UINT	0001HEX
	3	Get	Num Instances	UINT	0001HEX
	8	Get	Entry Port	UINT	0001HEX
	9	Get	All Ports	ARRAY of STRUCT UINT UINT	0000HEX 0000HEX 0004HEX 0002HEX

c. Instance Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1	1	Get	Port Type	UINT	0004HEX , TCP/IP Port
	2	Get	Port Number	UINT	0002HEX, CIP port number associate with port
	3	Get	Port Object	UINT Padded EPATH	
	4	Get	Port Name	Short_String	=0
	7	Get	Node Address	Padded EPATH	

6. TCP/IP Object

Class Code: F5HEX

a. Common Services

Service Code	Implemented for		Service Name
	Class	Instance	
0x01	Yes	Yes	Get_Attribute_All
0x0E	Yes	Yes	Get_Attribute_Single
0x02	No	Yes	Set_Attribute_All
0x10	No	Yes	Set_Attribute_Single

b. Class Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
0	1	Get	Revision	UINT	0001HEX
	2	Get	Max Instance	UINT	0001HEX
	3	Get	Num Instances	UINT	

c. Instance Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1	1	Get	Status	DWORD	See section 6.c.i
	2	Get	Configuration Capability	DWORD	00000006HEX
	3	Get/Set	Configuration Control	DWORD	See section 6.c.ii
	4	Get	Physical Link Path Size of Path Path	STRUCT of: UINT Padded-PATH	 0002HEX 00 00 20 F6 24 01
	5	Get/Set	Interface Configuration	STRUCT of: UDINT UDINT UDINT UDINT UDINT STRING	 IP address Network Mask Gateway Address Name Server Name Server 2 Domain Name

i. Status Instance Attributes

This attribute indicates the status of the TCP/IP network interface.

Bit	Description
0-3	0 – The Interface Configuration attribute has not been configured. 1 – The Interface Configuration attribute contains valid configuration from BOOTP, DHCP, or non-volatile storage. 2 – The Interface Configuration attribute contains valid configuration, obtained from DIP switch. 3-15 – Reserved.
4	Indicates pending configuration change in TTL and/or Mcast config.
5-31	Reserved

ii. Configuration Control Instance Attributes

This attribute is a bitmap to control network configuration.

Bit	Description
0-3	Determine how the device shall obtain its initial configuration at startup. 0 – The device shall use the interface configuration values previously stored in EEPROM. 1 – The device shall use the interface configuration values via BOOTP. 2 – The device shall use the interface configuration values via DHCP upon start-up. 3-15 – Reserved.
4	If TRUE, the device shall resolve host names by querying a DNS server.
5-31	Reserved

7. Ethernet Link Object

Class Code: F6HEX

a. Common Services

Service Code	Implemented for		Service Name
	Class	Instance	
0x01	Yes	Yes	Get_Attribute_All
0x0E	Yes	Yes	Get_Attribute_Single

b. Class Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
0	1	Get	Revision	UINT	0002HEX
	2	Get	Max Instance	UINT	0001HEX
	3	Get	Num Instances	UINT	0001HEX

c. Instance Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1	1	Get	Interface Speed	UDINT	10DEC, 100DEC
	2	Get	Interface Flags	DWORD	Bit 0 : Link Active Bit 1 : Full Duplex Bit 2~4 : Auto negotiation Bit 5 : Manual Setting required Reset Bit 6 : Local Hardware Fault Others : 0
	3	Get	Physical Address	ARRAY of 6 USINTs	Same as MAC address

8. I/O Bus Manager Object

Class Code: 70HEX

a. Common Services

Service Code	Implemented for		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

b. Class Attributes

None

c. Instance Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1	1	Get	Number of I/O Slot	USINT	(include deactivated slot)
	2	Get	Number of Activated Slot	USINT	
	3	Get	Number of Deactivated Slot	USINT	
	4	Get	External IDs	Array of 64 WORD	
	5	Get/Set*	Selection of Input (Produced) Process Image Mode	USINT	(default 2) Fixed
	6	Get/Set*	Selection of Output (Consumed) Process Image Mode	USINT	(default 0) Fixed
	10	Get	I/O Bus Status	USINT	0: Normal Operation 1: I/O Bus Standby 2: I/O Bus Connection Fault 3: Expansion Configuration Fault 4: No expansion module
	11	Get	Input (Produced) Byte Size	UINT	IO input byte size
	12	Get	Output (Consumed) Byte Size	UINT	IO output byte size
	13	Get/Set*	Enable Input Run/Idle Header	BOOL	0:Disabled Input Run/Idle Header (default) Fixed
	14	Get/Set*	Enable Output Run/Idle Header	BOOL	1:Enabled Output Run/Idle Header (default) Fixed
	15	Get/Set*	Output Reset at stop	BOOL	0:Disable(default) 1:Enable

*After the system is reset, the new “Set Value” action is applied. If slot location is changed, default value is set automatically.

i. External ID's

Word	Description
0	Network Adapter Module External ID = 0x00
1	External ID for slot position #1
2	External ID for slot position #2
. . .	. . .
62	External ID for slot position #62
63	External ID for slot position #63

9. Expansion Slot Object

Class Code: 71HEX

a. Common Services

Service Code	Implemented for		Service Name
	Class	Instance	
0x0E	No	Yes	Get_Attribute_Single
0x10	No	Yes	Set_Attribute_Single

b. Class Attributes

None

c. Instance Attributes

Instance ID	Attribute ID	Access Rule	Name	Data Type	Value
1~63 (Slot Address)	1	Get	Module External ID	USINT	Unitronics Module ID
	2	Get	I/O Data Code - Input Data Code - Output Data Code	Structure of: USINT USINT	
	3	Get	Input Offset Table - Byte Offset - Bit Offset	Structure of: USINT USINT	Byte offset in the Input Assembly Corresponding bit offset in the byte (If Input data length is zero, then return Empty.)
	4	Get	Output Offset Table - Byte Offset - Bit Offset	Structure of: USINT USINT	Byte offset in the Output Assembly Corresponding bit offset in the byte (If Output data length is zero, then return Empty.)
	5	Get	Input Data	Array of BYTE	Read Input data size defined by attribute 2. If Input data length is zero, then return Empty.
	6	Get/Set	Output Data	Array of BYTE	Read/Write Output data size defined by attribute 2. If Output data length is zero, then return Empty.
	7	Get/Set*	Active Flag	BOOL	0: This slot is activated 1: This slot is deactivated
	8	Get	Configuration Parameter Data length	USINT	I/O Bus Parameter
	9	Get/Set	R/W Configuration Data	n Byte	Data array size defined by attribute 8.
	100	Get	Product Code	4 Byte	See Table 4.10.2

	101	Get	Catalog Number	4 Byte	
	102	Get	Firmware Revision	Structure of: USINT USINT	Expansion Module Firmware Revision

*After the system is reset, the new “Set Value” action is applied. If slot location is changed, default value is set automatically.

i. I/O Data Code Format

Byte#	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
+0	Input Data Type		Input Data Length					
+1	Output Data Type		Output Data Length					

Input/output Type

0 0: No I/O Data

0 1: Byte Data

1 0: Word Data

1 1: Bit Data

Input/output Data Length

0 0 0 0 0 0: 0 Bit/Byte/Word

0 0 0 0 0 1: 1 Bit/Byte/Word

0 0 0 0 1 0: 2 Bit/Byte/Word

0 0 0 0 1 1: 3 Bit/Byte/Word

…

1 1 1 1 1 1: 63 Bit/Byte/Word

ii. Product Code Format

Byte#	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
+0	Connection Type							
+1	Assembly Type							
+2	Output Information							
+3	Input Information							

Connection Type

Byte#	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit
+0	Reserved						Mem	IO

IO (Input/output Connection)

IO = 0: does not support Input/output Connection

IO = 1: support Input/output Connection

MEM (Memory Register Service)

MEM = 0: does not support Memory Register Service Connection

MEM = 1: support Memory Register Service Connection

Assembly Type

Byte#	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit
+1	Unit Type		Priority		S	Reserved		

Unit Type

0 0: Not Used
0 1: Input Module
1 0: Output Module
1 1: I/O Both Modules

Priority (Input/output Data Priority for assembly)

0 0: Priority 0 (low), usually it is used by Byte/Bit Type Discrete module.
0 1: Priority 1
1 0: Priority 2, usually it is used by Analog I/O module.
1 1: Priority 3 (high)

Status	Input Data
Normal	0x0000 (4mA) ~ 0x3FFF (20mA)
Open Wire or Under Range (0~3mA)	0x8000 (-32678)

Table 1: Example for analog current module

Input / Output Information

Byte#	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0	
+2	Data_Type		Data_Length						Output Information
+3	Data_Type		Data_Length						Input Information

Input/output Type

0 0: No I/O Data
0 1: Byte Data
1 0: Word Data
1 1: Bit Data

Input/output Data Length

0 0 0 0 0 0: 0 Bit/Byte/Word
0 0 0 0 0 1: 1 Bit/Byte/Word
0 0 0 0 1 0: 2 Bit/Byte/Word
0 0 0 0 1 1: 3 Bit/Byte/Word
…
1 1 1 1 1 1: 63 Bit/Byte/Word