Modbus Wiring & Registry Map Instructions

IntelliTrace

ITAS, ITLS, ITASC1D2, ITLSC1D2

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Addendum to PK497

CHROMALOX
Advanced Thermal Technologies

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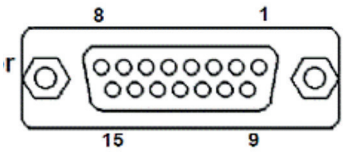
Modbus Wiring Connection for ITAS & ITLS Control Panels - Ordinary Areas Only

Note: DIN rail mounted connection for stranded wire connections area also available; contact Chromalox for further information

PLC Connector Pinout



Pin Number	Connection
1	Chassis GND
2	PLC TXD (RS232C)
3	PLC RXD (RS232C)
4	+5 V (100Ω)
5	Logic GND
6	LE
7	PLC CTS (RS232C)
8	PLC RTS (RS232C)
9	RXD + (RS422A)
10	RXD - (RS422A)
11	TXD + (RS422A)
12	TXD - (RS422A)
13	Terminating Resistor (connect to pin 9)
14	NC

RS-232

- Connect TXD of device to pin 3 RXD of touchscreen
- Connect RXD of device to pin 2 TXD of touchscreen
- Connect logic ground of device to pin 5 Logic GND of touchscreen

RS-485

- Connect TXD/RXD+ of device system to pin 9 RD+ of touchscreen D-sub 15-pin
- Connect TXD/RXD- of device system to pin 10 RD- of touchscreen D-sub 15-pin
- Connect GND of device to pin 5 Logic GND of touchscreen D-sub 15-pin
- Tie shield of cable to earth connection pin 1 touch-screen D-sub 15-pin
- For touchscreen D-sub 15-pin connection, Jumper pin 9 RD+ to pin 11 SD+
- For touchscreen D-sub 15-pin connection, Jumper pin 10 RD- to pin 12 SD-
- For touchscreen D-sub 15-pin connection, jumper pin 13 Termination to pin 9 RD+

Modbus TCP

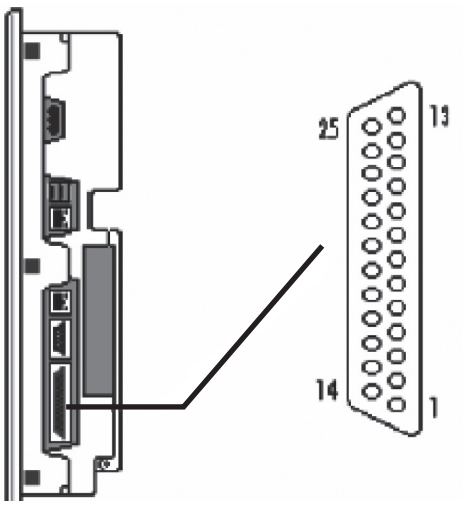
- Connect Ethernet cable to the back of the HMI display
- IP address will be assigned automatically by the DHCP Host and it will be displayed on the COMM page.

Modbus Wiring Connection for ITASC1D2 & ITLSC1D2 Control Panels - Hazardous Areas (Class I, Div. 2) Only

Note: DIN rail mounted connection for stranded wire connections area also available; contact Chromalox for further information.

A DB25S (female) connector, mounted on the bottom of the enclosure, provides standard signals as described in the following table.

Bottom



Pin Number	Connection	Pin Number	Connection
1	GND Frame Ground	14	VCC -5 VDC, 0.5A
2	TX (EIA232C)	15	TXB (EIA485)
3	RX (EIA232C)	16	RXB (EIA485)
4	RTS (EIA232C)	17	n/c
5	CTS (EIA232C	18	CSB (EIA485)
6	DSR (EIA232C)	19	ERB (EIA485)
7	SG Signal Ground	20	DTR (EIA232C)
8	DCD (EIA232C)	21	CSA (EIA485)
9	TRMRXB (EIA232C)	22	ERA (EIA485)
10	RXD - (RS422A)	23	n/c
11	TXA (EIA485)	24	n/c
12	n/c	25	n/c
13	n/c		

Note: Pin 14 is fused with a field-replaceable 1.0 A fast-blow fuse

RS-232
- Connect to touchscreen computer via DB25 cable that will be stripped from the female end.
- Pin #2 of the cable connects to the RXD on the converter
- Pin # 3 to TXD
- Pin #7 to COM A

RS-485
- Connect from pins described above to RA-ISOCON RS485/232 converter module.
- The customer would then connect to the RS-ISOCON module

Modbus TCP
- Connect Ethernet cable to the back of the HMI display
- IP address will be assigned automatically by the DHCP Host and it will be displayed on the COMM page.

Description of Modbus Register Set

Table A
HT Touch Screen Computer Function and Exception Code Set

Function Code	Function Name
01	Read Outputs
02	Read Input Discretes
03	Read Input Registers
04	Write Single Register

Detailed Register Descriptions are on the following pages.

Discrete Output Assignments, Function Code $01

Channel outputs can be disabled through use of the discrete output register set.

Table 1: Heat Trace 6-Pak SSR Controller Discrete Output Address Map (6 circuit Power board)

Data Address	Hex Address	Description
0	$0000	1st Output Disable (equals 0 if enabled and equals 1 if disabled)
1	$0001	2nd Output Disable (equals 0 if enabled and equals 1 if disabled)
2	$0002	3rd Output Disable (equals 0 if enabled and equals 1 if disabled)
3	$0003	4th Output Disable (equals 0 if enabled and equals 1 if disabled)
4	$0004	5th Output Disable (equals 0 if enabled and equals 1 if disabled)
5	$0005	6th Output Disable (equals 0 if enabled and equals 1 if disabled)
6	$0006	7th Output Disable (equals 0 if enabled and equals 1 if disabled)
7	$0007	8th Output Disable (equals 0 if enabled and equals 1 if disabled)
8	$0008	9th Output Disable (equals 0 if enabled and equals 1 if disabled)
9	$0009	10th Output Disable (equals 0 if enabled and equals 1 if disabled)
…	…	…
72	0x0048	72nd Output Disable (equals 0 if enabled and equals 1 if disabled)
73	0x0049	Temperature units (1=F, 0=C)
74	0x0050	Mapping Enabled(1=Yes, 0=No)
75 -- 65535	$0051 - $FFFF	Undefined, available for application assignment

Detailed Register Descriptions are on the following pages.

Discrete Inputs, Function Code $02

This type of function code is used by the master to inquire as to the current state of the discrete inputs of the Heat Trace Touch Screen Computer. Discrete inputs are defined as items whose value can be expressed in one of two states (e.g., “ON-OFF”, “TRUE-FALSE”, “ENABLED-DISABLED”).

Table 2: Heat Trace 6-Pak SSR Controller Discrete Output Address Map (6 circuit Power board)

Data Address	Hex Address	Description
0	$0000	GFI Error 1st Channel (equals 1 if Ground Fault is detected)
1	$0001	GFI Error 2nd Channel (equals 1 if Ground Fault is detected)
2	$0002	GFI Error 3rd Channel (equals 1 if Ground Fault is detected)
3	$0003	GFI Error 4th Channel (equals 1 if Ground Fault is detected)
4	$0004	GFI Error 5th Channel (equals 1 if Ground Fault is detected)
5	$0005	GFI Error 6th Channel (equals 1 if Ground Fault is detected)
6	$0006	GFI Error 7th Channel (equals 1 if Ground Fault is detected)
7	$0007	GFI Error 8th Channel (equals 1 if Ground Fault is detected)
…	…	…
71	0x0047	GFI Error 72nd Channel (equals 1 if Ground Fault is detected)
72	0x0048	SENSOR Error 1st Channel (equals 1 if Sensor Fault is detected)
73	0x0049	SENSOR Error 2nd Channel (equals 1 if Sensor Fault is detected)
…	…	…
143	0x8F	SENSOR Error 72nd Channel (equals 1 if Sensor Fault is detected)
144	0x90	HI TEMP 1st Channel (equals 1 if HI TEMP Fault is detected)
145	0x91	HI TEMP 2nd Channel (equals 1 if HI TEMP Fault is detected)
…	…	…
215	0xD7	HI TEMP Error 72nd Channel (equals 1 if HI TEMP Fault is detected)
216	0xD8	LO TEMP Error 1st Channel (equals 1 if LO TEMP Fault is detected)
217	0xD9	LO TEMP Error 2nd Channel (equals 1 if LO TEMP Fault is detected)
…	…	…
287	0x11F	LO TEMP Error 72nd Channel (equals 1 if LO TEMP Fault is detected)
288	0x120	MAX LOAD Error 1st Channel (equals 1 if MAX LOAD Fault is detected)
289	0x121	MAX LOAD Error 2nd Channel (equals 1 if MAX LOAD Fault is detected)
…	…	…
359	0x167	MAX LOAD Error 72nd Channel (equals 1 if MAX LOAD Fault is detected)
360	0x168	MIN LOAD Error 1st Channel (equals 1 if MIN LOAD Fault is detected)
361	0x169	MIN LOAD Error 2nd Channel (equals 1 if MIN LOAD Fault is detected)
…	…	…
431	0x1AF	MIN LOAD Error 72nd Channel (equals 1 if MIN LOAD Fault is detected)
432	0x1B0	Is Channel # 1in Manual
433	0x1B1	Is Channel # 2in Manual
…	..	…

Data Address	Hex Address	Description
503	0x1F6	Is Channel # 72in Manual
504	0x1F7	Control Mode CKT1 (1= PID, 0=ONOFF)
…	…	…
575	0x23F	Control Mode CKT72 (1= PID, 0=ONOFF)
576	0x240	Is Soft Start ON CKT 1 (1- Yes, 0- No)
…	…	…
648	0x288	Is GFEP Trip selected CKT 1 (1-Yes, 0- No)
…	…	…
720	0x2D0	Is GFEP “Latch” selected CKT 1(1-Yes, 0-No)
…	…	…
792	0x318	COMM Error on CKT 1 (equals 1 if COMM Fault is detected)
…	…	…
864	0x360	Is system in alarm (1- Yes, 0-No)

Input Register Assignments, Function Code $04

This type of function code is used by the master to inquire as to the current state of the discrete inputs of the Heat Trace Touch Screen Computer. Discrete inputs are defined as items whose value can be expressed in one of two states (e.g., “ON-OFF”, “TRUE-FALSE”, “ENABLED-DISABLED”).

Table 3: Heat Trace Touch Screen Computer Input Register Address Map

Data Address	Hex Address	Description	Range	Comments
Control Loop Input Registers				
0	0	Sensed current Channel 1	0.0-100.0 amps	Expressed as integer number of tenth-amps
1	1	Sensed current Channel 2	0.0-100.0 amps	Expressed as integer number of tenth-amps
2	2	Sensed current Channel 3	0.0-100.0 amps	Expressed as integer number of tenth-amps
3	3	Sensed current Channel 4	0.0-100.0 amps	Expressed as integer number of tenth-amps
4	4	Sensed current Channel 5	0.0-100.0 amps	Expressed as integer number of tenth-amps
5	5	Sensed current Channel 6	0.0-100.0 amps	Expressed as integer number of tenth-amps
…	…	…	…	…
71	0x0047	Sensed current Channel 72	0.0-100.0 amps	Expressed as integer number of tenth-amps
72	0x0048	Sensed GFI current Channel 1	0-150 mA	Expressed as integer number in mA
73	0x0049	Sensed GFI current Channel 2	0-150 mA	Expressed as integer number in mA
…	…	…	…	…
143	0x008F	Sensed GFI current Channel 72	0-150 mA	Expressed as integer number in mA
144	0x0090	Sensed RTD temp Channel 1	-80 -1100	Expressed as integer number in deg F
145	0x0091	Sensed RTD temp Channel 2	-80 -1100	Expressed as integer number in deg F
146	0x0092	Sensed RTD temp Channel 3	-80 -1100	Expressed as integer number in deg F
--	--	--		
215	0x00D7	Sensed RTD temp Channel 72	-80 -1100	Expressed as integer number in deg F

Data Address	Hex Address	Description	Range	Comments
216	0x00D8	Setpoint chan 1	-80 -1100	Expressed as integer number in deg F
217	0x00D9	Setpoint chan 2	-80 -1100	Expressed as integer number in deg F
---	---	---		
288	0x0120	Proportional Band chan 1	1-100	Expressed as integer number in deg F
288	0x0121	Proportional Band chan 2	1-100	Expressed as integer number in deg F
---	---	---		
360	0x0168	Integral chan 1	0-100	Expressed as integer number
361	0x0169	Integral chan 2	0-100	Expressed as integer number
---	---	---		
432	0x01B0	Derivative chan 1	0-500	Expressed as integer number
433	0x01B1	Derivative chan 2	0-500	Expressed as integer number
---	---	---		
504	0x01F8	Hi Limit Temp setpoint for chan 1	-80 - 1100	Expressed as integer number in deg F
505	0x01F9	Hi Limit Temp setpoint for chan 2	-80 - 1100	Expressed as integer number in deg F
---	---	---		
576	0x0240	Max Load limit for channel 1	0.2 – 50	Expressed as integer number of tenth-amps
577	0x0241	Max Load limit for channel 2	0.2 – 50	Expressed as integer number of tenth-amps
--	---	---		
648	0x0288	GFI limit for channel 1	0-150	Expressed as an integer number in mA
649	0x0289	GFI limit for channel 2	0-150	Expressed as an integer number in mA
---	---	---		
720	0x02D0	Lo Limit Temp setpoint for chan 1	-80 - 1100	Expressed as integer number in deg F
721	0x02D1	Lo Limit Temp setpoint for chan 2	-80 - 1100	Expressed as integer number in deg F
---	---	---	---	---
792	0x318	Min Load limit for chan 1	0.2 – 50	Expressed as integer number of tenth-amps
793	0x319	Min Load limit for chan 2	0.2 – 50	Expressed as integer number of tenth-amps
---	---	---	---	---
864	0x35A	Is Chan 1 in Manual Mode	0-1	0-No, 1-Yes
…	…	…		
936	0x3A8	Autocycle	0-999	Expressed in hours
937	0x3A9	Total panel run time		Total panel run time (expressed in hours)
938	0x3AA	Number of current samples	3-100	Expressed as integer number
939	0x3AB	Time since last reset		Expressed as integer number

Holding Register Assignments, Function Code $06

Holding registers are intended for information and functions that can be read or written. Each holding register has a corresponding internal memory variable in the slave device. This association is shown in the address map table.

Table 4: Heat Trace Touch Screen Computer Holding Register Address Map

Data Address	Hex Address	Description	Range (Default Value)	Comments
Global Holding Registers				
0	0	Commanded Power 1st Channel	0%-100%	Expressed as integer number (e.g.100 = 100%)
1	1	Commanded Power 2nd Channel	0%-100%	Expressed as integer number
2	2	Commanded Power 3rd Channel	0%-100%	Expressed as integer number
3	3	Commanded Power 4th Channel	0%-100%	Expressed as integer number
4	4	Commanded Power 5th Channel	0%-100%	Expressed as integer number
5	5	Commanded Power 6th Channel	0%-100%	Expressed as integer number
6	6	Commanded Power 7th Channel	0%-100%	Expressed as integer number
7	7	Commanded Power 8th Channel	0%-100%	Expressed as integer number
…	…	…	…	…
71	0x0047	Commanded Power 72nd Channel	0%-100%	Expressed as integer number
72	0x0048	Setpoint for channel 1	-80 - 1100	Expressed as integer number in deg F
73	0x0049	Setpoint for channel 2	-80 - 1100	Expressed as integer number in deg F
---	---	---		
144	0x0090	High Temp Limit channel 1	-80 - 1100	Expressed as integer number in deg F
145	0x0091	High Temp limit channel 2	-80 - 1100	Expressed as integer number in deg F
---	---	---		
216	0x00D8	Low temp Limit channel 1	-80 - 1100	Expressed as integer number in deg F
217	0x00D9	Low temp limit channel 2	-80 - 1100	Expressed as integer number in deg F
---	---	---		
288	0x0120	Max Load limit channel 1	0.2 – 50.0	Expressed as integer number in tenths of Amp (e.g. 25 = 2.5 Amps)
289	0x00121	Max Load limit channel 2	0.2 – 50.0	Expressed as integer number in tenths of Amp
---	---	---		
360	0x0168	GFI threshold channel 1	0-150	Expressed as integer number in mA
361	0x0169	GFI threshold channel 2	0-150	Expressed as integer number in mA
---	---	---		
432	0x01B0	Min Load limit channel 1	0.2 – 50.0	Expressed as integer number in tenths of Amp (e.g. 25 = 2.5 Amps)
---	---	---		
504	0x01F8	Proportional Band Ckt 1	1-100	Expressed as integer number
…	…			
576	0x240	Integral Ckt 1	0-9999	Expressed as integer number
…	..			
648	0x288	Derivative Ckt 1	0-500	Expressed as integer number

Data Address	Hex Address	Description	Range (Default Value)	Comments
..	..			
720	0x2D0	Auto/Manual Ckt 1	0-1	
..	…			
792	0x318	Soft Start On Ckt 1	0-1	0-Off, 1-On
…	…			
864	0x360	PID vs On/Off Ckt 1	0-1	0-OnOff, 1-PID
…	…			
936	0x3A8	Circuit 1 Disabled	0-1	0-No, 1-Yes
…	…			
1008	0x3F0	Temperature unit	0-1	0-F,1-C
1009	0x3F1	Reset alarm	0-1	0-No, 1-Yes
1010	0x3F2	Reserved		
1011	0x3F3	Reserved		
1012	0x3F4	Reserved		
1013	0x3F5	Reserved		

Service Contact Information

Chromalox is a global supplier, providing the highest level of customer support. If you should have questions concerning your intelliTRACE™ ITLS/ITAS control panel, or need information, you may contact Chromalox at:

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103 Gamma Drive Pittsburgh, PA 15238 Phone: (412) 967-3800	1347 Heil-Quaker Blvd LaVergne, TN 37086 Phone: (615) 793-3900
Customer Service Hotline: 1-800-443-2640	

For application questions, you can:

1. Call one of our application engineers for personal assistance at 1-888-996-9258.
2. Visit the technical reference section of our website at www.chromalox.com for downloadable manuals in PDF format.

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