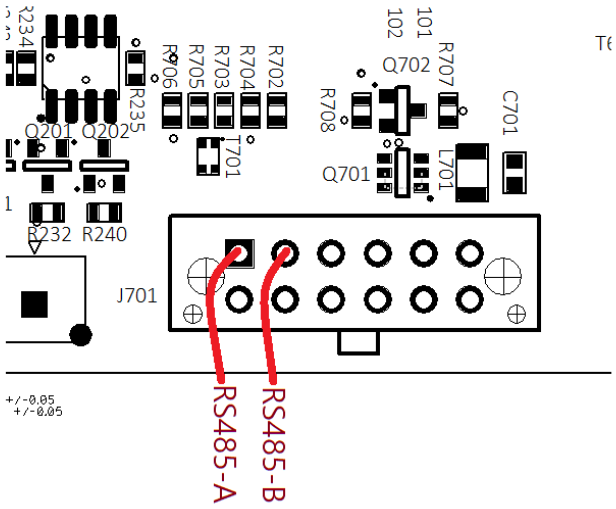
Cleveland I/O board
Modbus Communication Specification(v1.0)

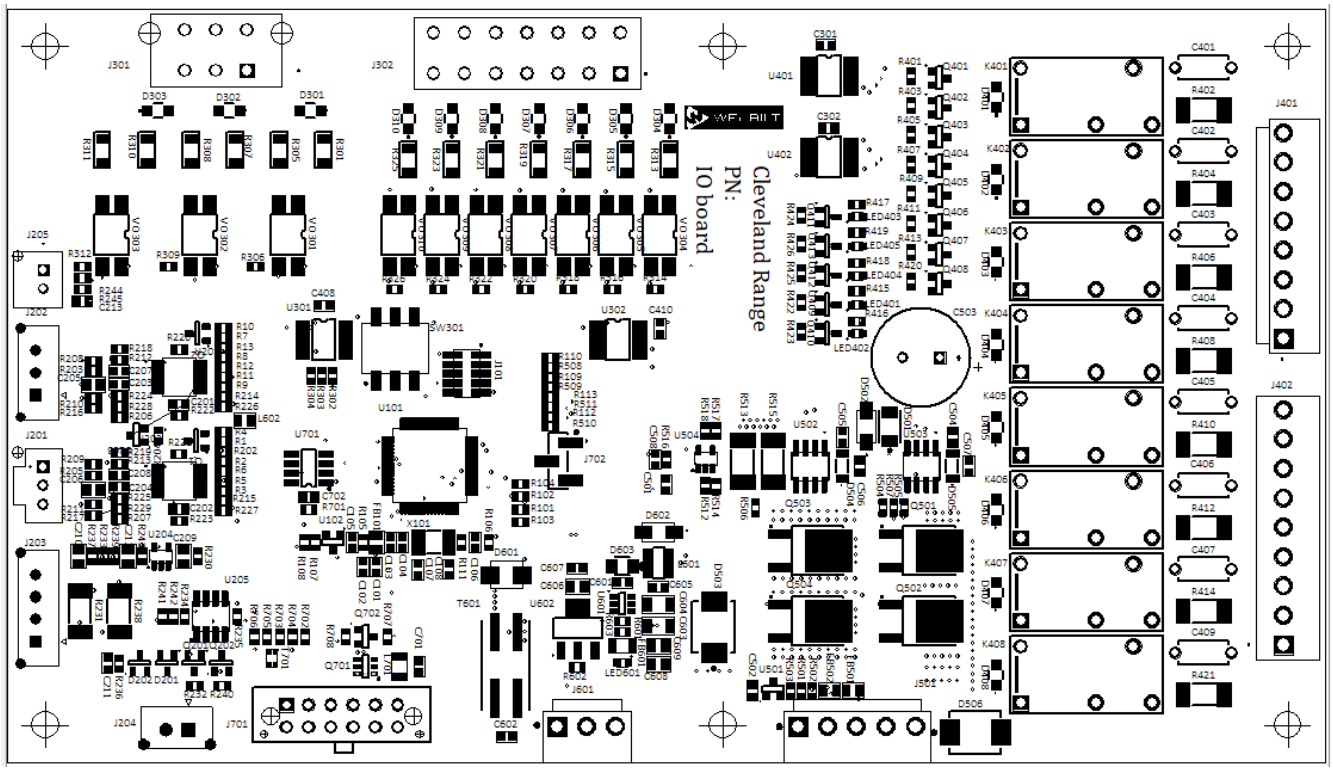
Connection:

Protocol: Modbus RTU (I/O board address: 1)
Communication: RS485 Half Duplex
Baud rate: 115 200
Data length: 8 bit
Parity: Even
Stop bit: 2

RS485 connection pin-out:



I/O board connections:



J301: Inputs(Low Pressure Switch, High Pressure Switch, Safety Thermostat)

J302: Inputs(Pan Up Limit Switch, Pan Down Limit Switch, Cover Up Limit Switch, Cover Down Limit Switch, Cover Lock Limit Switch)

J205: Flow Sensor input

J202: Jacket temperature sensor

J201: Product temperature sensor

J203: Pressure sensor

J204: Water level sensor

J701: User interface (UI)

J601: 24Vdc input

J501: Cover actuator

J401: Output relays(Solenoid Relief Valve, Water Solenoid, Convection Fan Motor)

J402: Output relays(Hydraulic Motor, 2 Way Solenoid for Hydraulics, Ignition Module)

Modbus holding registers list:

Add.	Reg Name	Function	Value	Unit	Read/Write
0	Configuration Jumper	Returns DIP switch status	0~7	Integer	Read only
1	Jacket temperature	Returns Jacket Temperature	0~650	Fahrenheit	Read only
2	Product temperature	Returns Product Temperature	0~650	Fahrenheit	Read only
3	Board temperature	Return Board Temperature	0~99	Celsius	Read only
4	Jacket temperature offset	Add offset to the Jacket reading	−50 ~ +50	Fahrenheit	Read/Write
5	Product temperature offset	Add offset to the product reading	−50 ~ +50	Fahrenheit	Read/Write
6	Process temperature set-point	Call for heat set-point to maintain Jacket temperature	1~650	Fahrenheit	Read/Write
7	Process temperature hysteresis	Temperature process hysteresis	1~5	Fahrenheit	Read/Write
8	Pressure sensor reading	Return pressure value	0~150	10*PSI	Read only
9	Flow sensor reading	Return flow sensor numbers of pulses	1~32 000	Pulses	Read/Write
10	Cover actuator current reading	Return cover actuator current draw	1~20 000	mA	Read only
11	Cover actuator over-current setting	Cover actuator over-current setting	1~20 000	mA	Read/Write
12	Cover Moving Speed setting	Set the maximum Speed for cover	200~990	Integer	Read/Write
13	Cover current position	Return current position of cover	0~1000	Integer	Read only
14	Cover position set-point	Set the cover position set-point in position mode	0~1000	Integer	Read/Write
15	Reserve				
16	Reserve				
17	PID P Value	Call for heat PID proportional value (p/1000)	0~10 000	Integer	Read/Write
18	PID I Value	Call for heat PID integrator value(i/1000)	0~10 000	Integer	Read/Write
19	PID D Value	Call for heat PID derivative value(d/1000)	0~10 000	Integer	Read/Write
20	Reserve				
21	Reserve				
22	Reserve				
23	Reserve				
24	Reserve				
25	Reserve				
26	Reserve				
27	Reserve				
28	IO board hardware revision	Return hardware revision	0~20	Integer	Read only
29	IO board software revision	Return software revision	0~1000	Integer	Read only

Modbus Coils list

Add.	Coil Name	Function	Value	Read/Write	Function
0	Call for Heat	Return 1 in case of Call for heat	Call for heat=1	Read only	flag
1	Water Level	Return 1 in case of water available	Water present=1	Read only	flag
2	Reserve				
3	Reserve				
4	Reserve				
5	Reserve				
6	Reserve				
7	Reserve				
8	Modbus communication watchdog	1=no communication for more than 10 seconds		Read only	flag
9	UI Restart	1= Power of the UI for 100mS		Read/Write	flag
10	Cover Enable	Enable move=1,(force move in open loop mode)	Enable =1	Read/Write	flag
11	Cover Direction	Opening direction=1 closing direction=0	open=1	Read/Write	flag
12	Cover Over Current	Over current triggered=1 motion will stopped	over-current=1	Read/Write	flag
13	Cover Position Mode	1= close loop(position mode) 0=open loop	Position mode=1	Read/Write	flag
14	Reserve				
15	Reserve				
16	Reserve				
17	Reserve				
18	Reserve				
19	Reserve				
20	Pan Up Limit Switch	Pan Up Limit Switch reading	0/1	Read only	Input
21	Pan Down Limit Switch	Pan Down Limit Switch reading	0/1	Read only	Input
22	Cover Up Limit Switch	Cover Up Limit Switch reading	0/1	Read only	Input
23	Cover Down Limit Switch	Cover Down Limit Switch reading	0/1	Read only	Input
24	Cover Lock Limit Switch	Cover Lock Limit Switch reading	0/1	Read only	Input
25	Reserve				
26	Reserve				
27	Low Pressure Switch	Low Pressure Switch reading	0/1	Read only	Input
28	High Pressure Switch	High Pressure Switch reading	0/1	Read only	Input
29	Safety Thermostat	Safety Thermostat reading	0/1	Read only	Input
30	Solenoid Relief Valve	Solenoid Relief Valve output	1 enabled relay	Read/Write	Output
31	Water Solenoid	Water Solenoid output	1 enabled relay	Read/Write	Output
32	Convection Fan Motor	Convection Fan Motor output	1 enabled relay	Read/Write	Output
33	Locking motor or solenoid	Locking motor or solenoid output	1 enabled relay	Read/Write	Output
34	Hydraulic Motor	Hydraulic Motor output	1 enabled relay	Read/Write	Output
35	Hydraulics 2 Way Solenoid	Hydraulics 2 Way Solenoid output	1 enabled relay	Read/Write	Output
36	Unused	Unused	1 enabled relay	Read/Write	Output
37	Ignition Module	Ignition Module output	1 enabled relay	Read only	Output
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