VALIDATION TEST OF INTERCONNECTIO BOX 200-1000-010

Refer to document Selftest_Strategy.pdf to help understand the test strategy used

#	Test	Stimulus	Measure	Action	Circuits	Signals Validation	Limits	Comments
1.0	ADC0	5V_PWR	ADC0	Open all relay (Default)	Current Module INA219	5V_PWR_ADC0	5V +/- 0.3V (ADC0 = 2.5V +/- 0.2V)	Verify 5V and ADC0. Check if led ON on Board to validate 5V
2.0	Digital PORTS Test 0-0x55	PORT0 Output	PORT1 Input	Open all relay (Default)	Buffer	PORT0, PORT1	Set Port0 = 0x55, Read Port 1 = 0x55	Validate Port 0 and Port1
2.1	Digital PORTS Test 0-0xAA	PORT0 Output	PORT1 Input	Open all relay (Default)		PORT0, PORT1	Set Port0 = 0xAA, Read Port 1 = 0xAA	Validate Port 0 and Port1
2.2	Digital PORTS Test 1-0x55	PORT1 Output	PORT0 Input	Open all relay (Default)		PORT0, PORT1	Set Port1 = 0x55, Read Port 0 = 0x55	Validate Port 0 and Port1
2.3	Digital PORTS Test 1-0xAA	PORT1 Output	PORT0 Input	Open all relay (Default)		PORT0, PORT1	Set Port1 = 0xAA, Read Port 0 = 0xAA	Validate Port 0 and Port1
2.4	Digital Handshake Test 1	CTRL output	FLAG Input	Open all relay (Default)		CTRL,FLAG	Set FLAG = 1, Read CTRL = 1	Validate state of the signals
2.5	Digital Handshake Test 0	CTRL output	FLAG Input	Open all relay (Default)		CTRL,FLAG	Set FLAG = 0, Read CTRL = 0	Validate state of the signals
2.6	Digital Signals Test 8-0x5	S1_IO8,S1_IO9,M1_IO8,M1_IO9 Output	Pico	Open all relay (Default)		S1_IO8,S1_IO9,M1_IO8,M1_IO9	Set Signal to 0x5, Read Pico = 0x5	Validate independent signal
2.7	Digital Signals Test 8-0xA	S1_IO8,S1_IO9,M1_IO8,M1_IO9 Output	Pico	Open all relay (Default)		S1_IO8,S1_IO9,M1_IO8,M1_IO9	Set Signal to 0xA, Read Pico = 0xA	Pico
3.0	Open Collector OC1 Close Test	SCPI command	ADC0	Close K16 (VM2), Drive OC1 = High		OC1_OUT	Read 0.2V + /- 0.2V	Open collector transistor activated
3.1	Open Collector OC1 Open Test	SCPI command	ADC0	Close K16 (VM2), Drive OC1 = Low		OC1_OUT	Read 5V +1.0/-0.4V	Open collector transistor not activated
3.2	Open Collector OC2 Close Test	SCPI command	ADC0	Close K15 (VM3), Drive OC2 = High		OC2_OUT	Read 0.2V + /- 0.2V	Open collector transistor activated
3.3	Open Collector OC2 Open Test	SCPI command	ADC0	Close K15 (VM3), Drive OC2 = Low		OC2_OUT	Read 5V +1.0/-0.4V	Open collector transistor not activated
3.4	Open Collector OC3 Close Test	SCPI command	ADC0	Close K15,K9 (VM4), Drive OC2 = High		OC3_OUT	Read 0.2V + /- 0.2V	Open collector transistor activated
3.5	Open Collector OC3 Open Test	SCPI command	ADC0	Close K15,K9 (VM4), Drive OC2 = Low		OC3_OUT	Read 5V +1.0/-0.4 V	Open collector transistor not activated
4.0	ADC1	5V_PWR	ADC1	Close K13	Current Module INA219	5V_PWR,ADC1	5V +0.3V/-0.4	Verify ADC1 input
4.1	DAC Ouput Hi Voltage	DAC_VOUT set to 3V	ADC1	Close K2,K13	DAC, Module Current Module INA219	DAC_VOUT,ADC0	3V +0.4V/-0.2	Validate DAC output with high voltage
4.2	DAC Ouput Low Voltage	DAC_VOUT set to 0.25V	ADC1	Close K2,K13		DAC_VOUT,ADC0	ADC1 = 0.25V +0.08/-0.02V	Validate DAC output with low voltage
5.0	Power measurement test Bus Voltage	5V_PWR	INA219 current	Open all relay (Default)			Read 5V +0.3/-0.4V	Validate 10 ohm current limit resistor
5.1	Power measurement test Shunt Voltage	5V_PWR	INA219 current	Close K4			Read 50mV + / - 7 mV	Validate 10 ohm current limit resistor
5.2	Power measurement test Current	5V_PWR	INA219 current	Close K4			Read 500mA + / - 50 mA	Validate 10 ohm current limit resistor
5.3	Power measurement test Current after C	5V_PWR	INA219 current	Close K4			Read 500mA + / - 5 mA	Validate 10 ohm current limit resistor
6.0	10 Ohms resistance test	5V_PWR	ADC0	Close K4 (10 ohm), K7_K11(PS8),K15,K16(VM5)	Current Module INA219	PWR_RES_H,PWR_RES_L	Read 2.5V +0.2/-0.4V	Validate FTS 10 ohm resistor
7.0	Low Power Relay NC1 Test	5V_PWR	INA219 current	Close K10 (PS2), Open LPR1, Close LPR2		K1_LP_C1, K1_LP_NC1,K2_LP_NO1,K2_LP_C1	Read 50mA +20/-5mA	Validate resistance contact of the two LPR in series
7.1	Low Power Relay NO1 Test	5V_PWR	INA219 current	Close K10 (PS2), Open LPR2, Close LPR1		K1_LP_C1,K1_LP_NO1,K2_LP_NC1,K2_LP_C1	Read 50mA +20/-5mA	Validate resistance contact
7.2	Low Power Relay Open1 Test	5V_PWR	INA219 current	Close K10 (PS2), Open LPR2, Open LPR1		K1_LP_C1,K1_LP_NO1,K2_LP_NC1,K2_LP_C1	Read 0mA +/ - 2mA	Validate resistance contact
7.3	Low Power Relay NC2 Test	5V_PWR	INA219 current	Close K8 (PS3), Open LPR1, Close LPR2		K1_LP_C2, K1_LP_NC2,K2_LP_NO2, K2_LP_C2	Read 50mA +20/-5mA	Validate resistance contact
7.4	Low Power Relay NO2 Test	5V_PWR	INA219 current	Close K8 (PS3), Open LPR2, Close LPR1		K1_LP_C2, K1_LP_NO2,K2_LP_NC2, K2_LP_C2	Read 50mA +20/-5mA	Validate resistance contact
7.5	Low Power Relay Open2 Test	5V_PWR	INA219 current	Close K8 (PS3), Open LPR2, Open LPR1		K1_LP_C2,K1_LP_NO1,K2_LP_NC2,K2_LP_C1	Read 0mA + / - 2mA	Validate resistance contact
8.0	HPR Close Test	5V_PWR	INA219 current	Close K4 (10 ohm), K7 (PS5), Close HPR	Current Module INA219	K3_HP_NO1, K3_HP_NO2, K3_HP_C1, K3_HP_C2	Read 250mA +50 / - 15mA	Validate close relay resistance contact
8.1	HPR Open Test	5V_PWR	INA219 current	Close K4 (10 ohm), K7 (PS5), Open HPR	Current Module INA219	K3_HP_NO1, K3_HP_NO2, K3_HP_C1, K3_HP_C2	Read 0mA + / - 0.2mA	Validate open relay resistance contact
9.0	SSR Close Test	5V_PWR	INA219 current	Close K4 (10 ohm), K8,K10 (PS4),Close SSR	Current Module INA219	SSR1_POS, SSR1_NEG	Read 250mA +50 / - 15mA	Validate close relay resistance contact
9.1	SSR Open Test	5V_PWR	INA219 current	Close K4 (10 ohm), K8,K10 (PS4), Open SSR	Current Module INA219	SSR1_POS, SSR1_NEG	Read 0mA + / - 0.2mA	Validate open relay resistance contact
10.0	Relay BK1-BK2 CH0-H Close Test	5V_PWR	INA219 current	K7_K8, K12 (PS8),K14, Close Relay BK1-CH0, BK2-CH0.	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_H	Read 50mA +20 / - 5mA	Validate relay contact close
10.1	Relay BK1-BK2 BK2_CH0_H Open Test	5V_PWR	INA219 current	K7_K8, K12 (PS8),K14, Close Relay BK1-CH0, Open BK2-CH0.	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_H	Read 0mA +0 / - 0.2mA	Validate relay contact close
10.2	Relay BK1-BK2 BK2_CH0_H Close Test	5V_PWR	INA219 current	K7_K8, K12 (PS8),K14, Close Relay BK1-CH0, BK2-CH0.	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_H	Read 50mA +20 / - 5mA	Validate relay contact close
10.3	Relay BK1-BK2 BK1_CH0_H Open Test	5V_PWR	INA219 current	K7_K8, K12 (PS8),K14, Close Relay BK2-CH0, Open BK1-CH0.	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_H	Read 0mA +0 / - 0.2mA	Validate relay contact close
10.4	Relay BK1-BK2 CH0-L Close Test	5V_PWR	INA219 current	K7_K8(PS7), Close Relay BK1-CH0, BK2-CH0.	Current Module INA219	BK1_COM_L, BK2_COM_L,BK1_CH0_L,BK2_CH0_L	Read 50mA +20 / - 5mA	Validate relay contact close
10.5	Relay BK1-BK2 BK2_CH0_L Open Test	5V_PWR	INA219 current	K7_K8(PS7), Close Relay BK1-CH0, Open BK2-CH0.	Current Module INA219	BK1_COM_L, BK2_COM_L,BK1_CH0_L,BK2_CH0_L	Read 0mA +0 / - 0.2mA	Validate relay contact close
10.6	Relay BK1-BK2 BK2_CH0-L Close Test	5V_PWR	INA219 current	K7_K8(PS7), Close Relay BK1-CH0, Close BK2-CH0.	Current Module INA219	BK1_COM_L, BK2_COM_L,BK1_CH0_L,BK2_CH0_L	Read 50mA +20 / - 5mA	Validate relay contact close
10.7	Relay BK1-BK2 BK1_CH0_L Open Test	5V_PWR	INA219 current	K7_K8(PS7), Close Relay BK2-CH0, Open BK1-CH0.	Current Module INA219	BK1_COM_L, BK2_COM_L,BK1_CH0_L,BK2_CH0_L	Read 0mA +0 / - 0.2mA	Validate relay contact close
10.XX	Repeat for other Channel CH1-CH7							
11.1	BK1-BK2 COM relay BK1-BK2 COM_H Clos	5V_PWR	INA219 current	K7_K8, K12 (PS8)_Close Relay BK1-CH0, BK2-CH0,BK1-COM,BK2-C	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
11.2	BK1-BK2 COM relay BK2-COM_H Open	5V_PWR	INA219 current	K7_K8, K12 (PS8)_Close Relay BK1-CH0, BK2-CH0,BK1-COM,	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
11.3	BK1-BK2 COM relay BK1-BK2 COM_H Clos	5V_PWR	INA219 current	K7_K8, K12 (PS8)_, Close Relay BK1-CH0, BK2-CH0,BK1-COM,BK2-	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
11.4	BK1-BK2 COM relay BK1-COM_H Open	5V_PWR	INA219 current	K7_K8, K12 (PS8), Close Relay BK1-CH0, BK2-CH0,BK1-COM	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
11.5	BK1-BK2 COM relay BK1-BK2 COM_L Clos	5V_PWR	INA219 current	K7_K8(PS7),K14, Close Relay BK1-CH0, BK2-CH0,BK1-COM,BK2-CO	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
11.6	BK1-BK2 COM relay BK2-COM_L Open	5V_PWR	INA219 current	K7_K8(PS7), K14,Close Relay BK1-CH0, BK2-CH0,BK1-COM,	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
11.7	BK1-BK2 COM relay BK1-BK2 COM_L Clos	5V_PWR	INA219 current	K7_K8(PS7),K14, Close Relay BK1-CH0, BK2-CH0,BK1-COM,BK2-CO	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
11.8	BK1-BK2 COM relay BK1-COM_L Open	5V_PWR	INA219 current	K7_K8(PS7), K14 Close Relay BK1-CH0, BK2-CH0,BK1-COM	Current Module INA219	BK1_COM_H, BK2_COM_H,BK1_CH0_H,BK2_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
12.0	Relay BK3-BK4 CH0-H Close Test	5V_PWR	INA219 current	K7_K8, K11,K12 (PS10),K15, Close Relay BK3-CH0, BK4-CH0.	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
12.1	Relay BK3-BK4 BK4_CH0_H Open Test	5V_PWR	INA219 current	K7_K8, K11,K12 (PS10),K15, Close Relay BK3-CH0, Open BK4-CH0.	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
12.2	Relay BK3-BK4 BK4_CH0_H Close Test	5V_PWR	INA219 current	K7_K8, K11,K12 (PS10),K15,, Close Relay BK3-CH0, BK4-CH0.	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
12.3	Relay BK3-BK4 BK3_CH0_H Open Test	5V_PWR	INA219 current	K7_K8, K11,K12 (PS10),K15, Close Relay BK4-CH0, Open BK3-CH0.	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
12.4	Relay BK3-BK4 CH0-L Close Test	5V_PWR	INA219 current	K7_K8,K11(PS9), Close Relay BK3-CH0, BK4-CH0.	Current Module INA219	BK3_COM_L, BK4_COM_L,BK3_CH0_L,BK4_CH0_L	Read 50mA +20 / - 5mA	Validate relay contact close
12.5	Relay BK3-BK4 BK4_CH0_L Open Test	5V_PWR	INA219 current	K7_K8,K11(PS9), Close Relay BK3-CH0, Open BK4-CH0.	Current Module INA219	BK3_COM_L, BK4_COM_L,BK3_CH0_L,BK4_CH0_L	Read 0mA +0 / - 0.2mA	Validate relay contact close
12.6	Relay BK3-BK4 BK4_CH0-L Close Test	5V_PWR	INA219 current	K7_K8,K11(PS9), Close Relay BK3-CH0, Close BK4-CH0.	Current Module INA219	BK3_COM_L, BK4_COM_L,BK3_CH0_L,BK4_CH0_L	Read 50mA +20 / - 5mA	Validate relay contact close
12.7	Relay BK3-BK4 BK3_CH0_L Open Test	5V_PWR	INA219 current	K7_K8,K11(PS9), Close Relay BK4-CH0, Open BK3-CH0.	Current Module INA219	BK3_COM_L, BK4_COM_L,BK3_CH0_L,BK4_CH0_L	Read 0mA +0 / - 0.2mA	Validate relay contact close
12.XX	Repeat for other Channel CH1-CH7							
13.1	BK3-BK4 COM relay BK3-BK4 COM_H Clos	5V_PWR	INA219 current	K7_K8, K11,K12 (PS10),K15, Close Relay BK3-CH0, BK4-CH0,BK3-	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
13.2	BK3-BK4 COM relay BK4-COM_H Open	5V_PWR	INA219 current	K7_K8, K11,K12(PS10),K15,Close Relay BK3-CH0, BK4-CH0,BK3-CC	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
13.3	BK3-BK4 COM relay BK3-BK4 COM_H Clos	5V_PWR	INA219 current	K7_K8, K11,K12(PS10),K15, Close Relay BK3-CH0, BK4-CH0,BK3-CC	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
13.4	BK3-BK4 COM relay BK3-COM_H Open	5V_PWR	INA219 current	K7_K8, K11,K12(PS10),K15, Close Relay BK3-CH0, BK4-CH0,BK3-CC	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
13.5	BK3-BK4 COM relay BK3-BK4 COM_L Clos	5V_PWR	INA219 current	K7_K8,K11 (PS9), Close Relay BK3-CH0, BK4-CH0,BK3-COM,BK4-C	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
13.6	BK3-BK4 COM relay BK4-COM_L Open	5V_PWR	INA219 current	K7_K8,K11 (PS9),Close Relay BK3-CH0, BK4-CH0,BK3-COM,	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
13.7	BK3-BK4 COM relay BK3-BK4 COM_L Clos	5V_PWR	INA219 current	K7_K8,K11 (PS9), Close Relay BK3-CH0, BK4-CH0,BK3-COM,BK4-CC	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 50mA +20 / - 5mA	Validate relay contact close
13.8	BK3-BK4 COM relay BK3-COM_L Open	5V_PWR	INA219 current	K7_K8,K11 (PS9), Close Relay BK3-CH0, BK4-CH0,BK3-COM	Current Module INA219	BK3_COM_H, BK4_COM_H,BK3_CH0_H,BK4_CH0_	Read 0mA +0 / - 0.2mA	Validate relay contact close
14.1	J2C Bus GPIO #6 Master	Send command to check lines using IO modes	Digital State	GPIO:IN:DEV0:GP6?		I2C_DATA Master Pico	read 1	
14.2	J2C Bus GPIO #7 Master	Send command to check lines using IO modes	Digital State	GPIO:IN:DEV0:GP7?		I2C_CLOCK Master Pico	read 1	
14.3	Get Selftest device status	Check I2C communication with selftest	Read I2C byte	COM:I2C:READ:LEN17 100		I2C Communication	read 0	
14.4	Get Selftest Major version	Check I2C communication with selftest	Read I2C byte	COM:I2C:READ:LEN17 01		I2C Communication	read 1	
14.5	J2C Bus GPIO #6 Selftest	Send command to read GPIO function of line	Read I2C byte	COM:I2C:READ:LEN17 75,6		I2C_DATA Selftest Pico	read 3	
14.6	J2C Bus GPIO #7 Selftest	Send command to read GPIO function of line	Read I2C byte	COM:I2C:READ:LEN17 75,7		I2C_CLOCK Selftest Pico	read 3	
15.0	SPI Bus GPIO #2 in digital mode	Set Selftest GPIO2 =0	Digital State	Read master Pico level on GPIO2 (GPIO:IN:DEV0:GP2?)		SPI_CLK	read 0	
15.1	SPI Bus GPIO #2 in digital mode	Set Selftest GPIO2 =1	Digital State	Read master Pico level on GPIO2 (GPIO:IN:DEV0:GP2?)		SPI_CLK	read 1	
15.2	SPI Bus GPIO #3 in digital mode	Set Selftest GPIO3 =0	Digital State	Read master Pico level on GPIO3 (GPIO:IN:DEV0:GP3?)		SPI_TX	read 0	
15.3	SPI Bus GPIO #3 in digital mode	Set Selftest GPIO3 =1	Digital State	Read master Pico level on GPIO3 (GPIO:IN:DEV0:GP3?)		SPI_TX	read 1	
15.4	SPI Bus GPIO #4 in digital mode	Set Selftest GPIO4 =0	Digital State	Read master Pico level on GPIO4 (GPIO:IN:DEV0:GP4?)		SPI_RX	read 0	
15.5	SPI Bus GPIO #4 in digital mode	Set Selftest GPIO4 =1	Digital State	Read master Pico level on GPIO4 (GPIO:IN:DEV0:GP4?)		SPI_RX	read 1	
15.6	SPI Bus GPIO #5 in digital mode	Set Selftest GPIO5 =0	Digital State	Read master Pico level on GPIO5 (GPIO:IN:DEV0:GP5?)		SPI_CS	read 0	
15.7	SPI Bus GPIO #5 in digital mode	Set Selftest GPIO5 =1	Digital State	Read master Pico level on GPIO5 (GPIO:IN:DEV0:GP5?)		SPI_CS	read 1	
15.8	SPI Communication 16 bits, Mode 0	Databits=16, Mode =0, CS toogle each byte, Baudrate =100	Read SPI bytes	Write word 0x1234, Read Reverse value in decimal		SPI_CLK,SPI_TX,SPI_RX,SPI_CS	Read 60875 (0xED0B)	
15.9	SPI Communication 8 bits, Mode 0	Databits=8, Mode =0, CS toogle each byte, Baudrate =100	Read SPI bytes	Write byte 0xAB, Read Reverse value in decimal		SPI_CLK,SPI_TX,SPI_RX,SPI_CS	Read 84 (0x54)	
15.10	SPI Communication 8 bits, Mode 1	Databits=8, Mode =1, CS toogle each byte, Baudrate =100	Read SPI bytes	Write byte 0xAS, Read Reverse value in decimal		SPI_CLK,SPI_TX,SPI_RX,SPI_CS	Read 90 (0x5A)	
15.11	SPI Communication 8 bits, Mode 2	Databits=8, Mode =2, CS toogle each byte, Baudrate =100	Read SPI bytes	Write byte 0x5A, Read Reverse value in decimal		SPI_CLK,SPI_TX,SPI_RX,SPI_CS	Read 165 (0xA5)	
15.12	SPI Communication 8 bits, Mode 3	Databits=8, Mode =3, CS toogle each byte, Baudrate =100	Read SPI bytes	Write byte 0x78, Read Reverse value in decimal		SPI_CLK,SPI_TX,SPI_RX,SPI_CS	Read 135 (0x87)	
16.0	Serial GPIO #13 in digital mode	Set Selftest GPI12 =0 (Serial Rx)	Digital State	Read Digital value		SERIAL_TX	Read 0	
16.1	Serial GPIO #13 in digital mode	Set Selftest GPI12 =1 (Serial Rx)	Digital State	Read Digital value		SERIAL_TX	Read 1	
16.2	Serial GPIO #12 in digital mode	Set Selftest GPI13 =0 (Serial Tx)	Digital State	Read Digital value		SERIAL_RX	Read 0	
16.3	Serial GPIO #12 in digital mode	Set Selftest GPI13 =1 (Serial Tx)	Digital State	Read Digital value		SERIAL_RX	Read 1	
16.4	Serial GPIO #15 in digital mode	Set Selftest GPI14 =0 (Serial Rts)	Digital State	Read Digital value		SERIAL_CTS	Read 0	
16.5	Serial GPIO #15 in digital mode	Set Selftest GPI14 =1 (Serial Rts)	Digital State	Read Digital value		SERIAL_CTS	Read 1	
16.6	Serial GPIO #14 in digital mode	Set Selftest GPI15 =0 (Serial Cts)	Digital State	Read Digital value		SERIAL_RTS	Read 0	
16.7	Serial GPIO #14 in digital mode	Set Selftest GPI15 =1 (Serial Cts)	Digital State	Read Digital value		SERIAL_RTS	Read 1	
16.8	Serial Status	Enable Master Serial and readback status	Digital State	COM:INIT:STAT? SERIAL		SERIAL_RX, SERIAL_TX	Read 1	
16.9	Serial communication 115.2K	Baudrate 115200, Protocol O72	Read Serial	Send serial string COM:SERIAL:Read? 'TEST O72,115200		SERIAL_RX, SERIAL_TX	read string: TEST O72,115200	
16.10	Serial communication 38.4K	Baudrate 38400, Protocol N81	Read Serial	Send serial string COM:SERIAL:Read? 'TEST N81,38400		SERIAL_RX, SERIAL_TX	read string: TEST N81,38400	
16.11	Serial communication 19.2K	Baudrate 19200, Protocol E61	Read Serial	Send serial string COM:SERIAL:Read? '12345678901,19200		SERIAL_RX, SERIAL_TX	read string: 12345678901,19200	
16.12	Serial communication Handshake	Baudrate 57600, Protocol N82, RTS-CTS handshake	Read Serial	Send serial string"COM:SERIAL:Read? 'TEST HANDSHAKE,57600		SERIAL_RX, SERIAL_TX, SERIAL_RTS,SERIAL_CTS	read string: TEST HANDSHAKE,57600	
17	1-wire Test J1, J2	Send command to check 1-wire	Read String			1W_J1,1W_J2	String contains VALID_OWID: 2D	Check 1-wire address
17.1	1-wire Test J1, J2	Send command to read 1-wire	Read String			1W_J1,1W_J2	String contains 500-1010	Check 1-wire contains
18	ERROR Led Test ON	Send command to turn ON error led	Digital State			ERR_LED	Read Pico GPIO11 = 1	
18.1	ERROR Led Test OFF	Send command to turn OFF error led	Digital State			ERR_LED	Read Pico GPIO11 = 0	
19	J23 Loopback test GP1 =0	GP1 out =0, GP1 read	Digital State	read GP1 driver value		GP1	Read 0	Validate output
19.1	J23 Loopback test GP1= 0	GP1 out =0, GP0 read	Digital State	read loopback state at GP0		GP0, GP1	Read 0	Validate loopback
19.2	J23 Loopback test GP1 =1	GP1 out =1, GP1 read	Digital State	read GP1 driver value		GP1	Read 1	Validate output
19.3	J23 Loopback test GP1 = 1	GP1 out =1, GP0 read	Digital State	read loopback state at GP0		GP0, GP1	Read 1	Validate loopback
19.4	J23 Loopback test GP1= 0	GP1 out =0, GP0 read	Digital State	read loopback state at GP0		GP0, GP1	Read 0	Validate loopback
19.5	J23 Loopback test GP0 =0	GP0 out =0, GP0 read	Digital State	read GP0 driver value		GP1	Read 0	Validate output
19.6	J23 Loopback test GP0= 0	GP0 out =0, GP1 read	Digital State	read loopback state at GP1		GP0, GP1	Read 0	Validate loopback
19.7	J23 Loopback test GP0 =1	GP0 out =1, GP0 read	Digital State	read GP0 driver value		GP1	Read 1	Validate output
19.8	J23 Loopback test GP0= 1	GP0 out =1, GP1 read	Digital State	read loopback state at GP1		GP0, GP1	Read 1	Validate loopback
19.9	J23 Loopback test GP0= 0	GP0 out =0, GP1 read	Digital State	read loopback state at GP1		GP0, GP1	Read 0	Validate loopback
20	J26 Loopback test GP16=0	GP16 out =0, GP16 read	Digital State	read GP16 driver value		GP16	Read 0	Validate output
20.1	J26 Loopback test GP16=0	GP16 out =0, GP18 read	Digital State	read loopback state at GP18		GP16,GP18	Read 0	Validate loopback
20.2	J26 Loopback test GP16=1	GP16 out =1, GP16 read	Digital State	read GP16 driver value		GP16	Read 1	Validate output
20.3	J26 Loopback test GP16=1	GP16 out =1, GP18 read	Digital State	read loopback state at GP18		GP16,GP18	Read 1	Validate loopback
20.4	J26 Loopback test GP21=0	GP21 out =0, GP21 read	Digital State	read GP21 driver value		GP21	Read 0	Validate output
20.5	J26 Loopback test GP21=0	GP21 out =0, GP17 read	Digital State	read loopback state at GP17		GP16,GP17	Read 0	Validate loopback
20.6	J26 Loopback test GP21=0	GP21 out =0, GP19 read	Digital State	read loopback state at GP19		GP16,GP19	Read 0	Validate loopback
20.7	J26 Loopback test GP21=1	GP21 out =1, GP21 read	Digital State	read GP21 driver value		GP21	Read 1	Validate output
20.8	J26 Loopback test GP21=1	GP21 out =1, GP17 read	Digital State	read loopback state at GP17		GP16,GP17	Read 1	Validate loopback
20.9	J26 Loopback test GP21=1	GP21 out =1, GP19 read	Digital State	read loopback state at GP19		GP16,GP19	Read 1	Validate loopback
25.0	Sense pin resistor Check	Resistor R6 on Selftest Board	Analog Meas	Measure value with ohmeter	10 Ohms	DVM_SENSE_H, DVM_SENSE_L	Dhmeter Value between 10 and 16 Ohm	Validate R6
25.1	DMM resistor path Check	Resistor R5,R6 and R7 on Selftest Board	Analog Meas	Measure value with ohmeter	4.7 Ohms + 10 Ohms + 4.7 Ohms	DVM_H, DVM_L	Dhmeter Value between 20 and 23 Ohm	Validate R5,R6 and R7
25.2	DMM ground path Check	Path resistance value	Analog Meas	K14(VM1), K4(ground), K10 (Ps1)		DVM_H, DVM_L	Dhmeter Value between 0 and 5 Ohm	Validate relay contact resistance
25.3	DMM 5V Check	5V Voltage Check	Analog Meas	K14(VM1)	PWR_5V	DVM_H, DVM_L,PWR_5V	Voltage Value between 4.75V and 5.25V	Validate Voltage measurement
25.4	DMM Low Current Check	5V_PWR to R1 (100 Ohm)	Analog Meas	K5(DVM_I)	100 ohms resistor	DVM_I, DVM_L,PWR_5V	Current Value between 48mA and 52mA	Validate Current measurement
25.5	DMM High Current Check	5V_PWR to R2 (10 Ohm)	Analog Meas	K5(DVM_I)	10 ohms resistor	DVM_I, DVM_L,PWR_5V	Current Value between 300mA and 400mA	Validate Current measurement
25.6	DMM Trig Check Low	Trigger Output Check	Analog Meas	Digital Test of voltage on DVM_TRIG		PCTRL,PFLAG,DVM_TRIG,DVM_H,DVM_L	Voltage Value between 0V and 0.1V	DVM_TRIG = 0
25.7	DMM Trig Check High	Trigger Output Check	Analog Meas	Digital Test of voltage on DVM_TRIG		PCTRL,PFLAG,DVM_TRIG,DVM_H,DVM_L	Voltage Value between 2V and 3.3V	DVM_TRIG = 1
26.0	PS1_OUT1 Output 12V Open Check	Set Voltage = 12V	Analog Meas	K4,K3,K8,K14,K15,K16,K9,K10	R2 (10 ohm) ,R12 (10 ohm)	DVM_H, DVM_L,PS1_OUT_H1,PS1_OUT_LO1	Voltage Value between 0V and 0.1V	SSR1 open
26.1	PS1_OUT1 Output 12V Close Check	Set Voltage = 12V	Analog Meas	K4,K3,K8,K14,K15,K16,K9,K10, SSR1	R2 (10 ohm) ,R12 (10 ohm)	DVM_H, DVM_L,PS1_OUT_H1,PS1_OUT_LO1	Voltage Value between 5V and 6V	SSR1 close
26.2	PS1_OUT2 Output 10V Open Check	Set Voltage = 10V	Analog Meas	K4,K3,K8,K14,K15,K16,K9,K10,K1	R2 (10 ohm) ,R12 (10 ohm)	DVM_H, DVM_L,PS1_OUT_H2,PS1_OUT_LO2	Voltage Value between 0V and 0.1V	SSR1 open
26.3	PS1_OUT2 Output 10V Close Check	Set Voltage = 10V	Analog Meas	K4,K3,K8,K14,K15,K16,K9,K10, SSR1	R2 (10 ohm) ,R12 (10 ohm)	DVM_H, DVM_L,PS1_OUT_H1,PS1_OUT_LO2	Voltage Value between 4V and 5V	SSR1 close
27.0	Oscilloscope CH1 Check	Set Selftest PWM = 1KHz	Signal Meas	K7		SCOPE_CH1+,SCOPE_CH1-,PICODRV	Scope signal is 3.3V@1KHz	Scope CH1 path
27.1	Oscilloscope CH2 Check	Set Selftest PWM = 100KHz	Signal Meas	K3,K7		SCOPE_CH2+,SCOPE_CH2-,PICODRV	Scope signal is 3.3V@100KHz	Scope CH2 path
28.0	AWG Check	Set AWG to Sinus at 5Vpp@10KHz	Signal Meas			SCOPE_CH1+,SCOPE_CH1-,AWG+,AWG-	Scope signal is sinus at 5V@10KHz	AWG path
29.0	External INST Check	Set AWG to Triangle at 5Vpp@10KHz	Signal Meas	K2		SCOPE_CH1+,SCOPE_CH1-,INST+,INST-	Scope signal is triangle at 5V@10KHz	INST path
30.0	USB path Test	USB flash drive	Data Check	USB cable to PC		USB1_D+,USB1_D-,USB1_VCC,USB1_GND	Read on flash disk	USB Path
31.0	Ethernet path Test	Box between internet source and PC	Com Check	Ethernet Cable TO PC		ETH_TX+,ETH_RX+,ETH_TX-,ETH_RX-	Network is ON	Ethernet Path