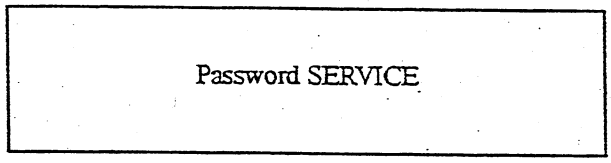
Turbine Serial Number:	99H5046
Electronic Speed Control Governor:	Woodward Peak 505
Actuator:	Fisher 585
Signal Gear:	30 Tooth
Power Supply Voltage:	24 VDC
Minimum Governor Speed Setpoint:	4800 rpm
Maximum Governor Speed Setpoint:	6720 rpm
Electronic Overspeed Trip:	6880 rpm
Mechanical Overspeed Trip:	7040 rpm
Overspeed Test Limit:	7290 rpm

GENERAL

The 505 Series control system requires a password to be entered before access can be given to the SERVICE, CONFIGURE, DEBUG, or OS_FAULTS modes. The Download Configuration function also requires a password. These passwords are intended to help prevent unauthorized or untrained personnel from accessing these modes and possibly making changes that could cause damage to the turbine or associated process. If only certain people are to know these passwords, remove this appendix and keep it in a separate place, apart from the manual.

SERVICE MODE PASSWORD

When the display reads:

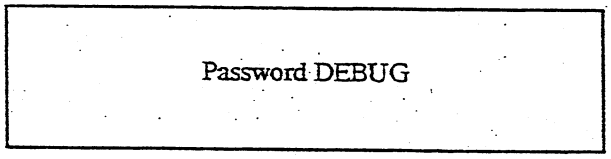


The password for your control is: 1 1 1 1

Press the keys on the 505 front panel in this sequence followed by ENTER to gain access to the SERVICE mode.

DEBUG MODE PASSWORD

When the display reads:

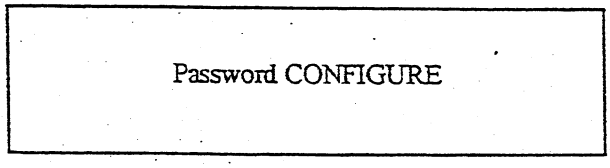


The password for your control is: 1 1 1 2

Press the keys on the 505 front panel in this sequence followed by ENTER to gain access to the DEBUG Mode.

CONFIGURE MODE PASSWORD

When the display reads:



The password for your control is: 1 1 1 3

Press the keys on the 505 front panel in this sequence followed by ENTER to gain access to the CONFIGURE mode.

OS_FAULTS MODE PASSWORD

When the display reads:

Password OS_FAULTS

The password for your control is: 1 1 1 4

Press the keys on the 505 frontpanel in this sequence to gain access to the OS_FAULTS mode.

DOWNLOAD CONFIGURATION FUNCTION PASSWORD

When the display reads:

To Load Configuration Enter Password

The password for your control is: 1 1 1 6

Press the keys on the 505 front panel in this sequence followed by ENTER to gain access to the Load Configuration function.

505 PROGRAM MODE WORKSHEET

GOVERNOR SERIAL NUMBER 12201274

APPLICATION 9945046 Turbine/Generator DATE 24-Aug-99

For details on individual settings, refer to Chapter 5.

TURBINE START

Manual Start	YES	NO	✓
Automatic Start	YES ✓	NO	
Semiautomatic Start	YES	NO	✓
Rate to Min (RPM/Sec)	50.	RPM/SEC	
Valve Lmtr Rate (%/Sec)	5.	%/SEC	
Use Idle/Rated?	YES	NO	✓
Idle Setpt (RPM)	1000.	RPM	
Rated Setpt (RPM)	3600.	RPM	
Idle/Rtd Rate (RPM/SEC)	5.	RPM/SEC	
Use Auto Start Sequence	YES	NO	✓
Cold Start = (> xx Hrs)	10.	HRS	
Hot Start = (< xx Hrs)	1.	HRS	
Low Idle Setpt (RPM)	1000.	RPM	
Low Idle Delay (Cold)	1.0	MIN	
Low Idle Delay (Hot)	1.0	MIN	
Rate to Hi Idle (Cold)	5.0	RPM/SEC	
Rate to Hi Idle (Hot)	5.0	RPM/SEC	
High Idle Setpt (RPM)	2000.	RPM	
High Idle Delay (Cold)	1.0	MIN	
High Idle Delay (Hot)	1.0	MIN	
Rate to Rated (Cold)	5.0	RPM/SEC	
Rate to Rated (Hot)	5.0	RPM/SEC	
Rated Setpt (RPM)	3600.	RPM	
Auto Halt at Idle Setpts	YES	NO	✓
Ext Trips in Trip Relay	YES ✓	NO	
Reset Clears Trip Output	YES	NO	✓

SPEED CONTROL

Teeth Seen by MPU	30.		
Gear Ratio 1 :	1.		
Failed Speed Level(RPM)	250.	RPM	
Use Speed Input #2?	YES ✓	NO	
Failed Speed Level(RPM)	250.	RPM	
Off-Line Prop Gain	5.	%	
Off-Line Int Gain	.5	rps	
Off-Line Deriv Ratio	5.0	%	
On-Line Prop Gain	5.	%	
On-Line Int Gain	.5	rps	
On-Line Deriv Ratio	5.0	%	

SPEED SETPOINT VALUES

Overspeed Test Lmt (RPM)	7290.	RPM
Overspeed Trip (RPM)	6880.	RPM
Max Governor Speed (RPM)	6732.	RPM
Min Governor Speed (RPM)	[illegible]	RPM
Setpt Slow Rate(RPM/SEC)	[illegible]	RPM/SEC

Use Remote Speed Setpt ?	YES	NO	✓
Rmt Spd Setpt Max Rate	50	RPM/SEC	
Use Critical Speeds?	YES	NO	✓
Critical Speed Rate	50.	RPM/SEC	
Critical Speed 1 Max	[illegible]	RPM	
Critical Speed 1 Min	[illegible]	RPM	
Use Critical Band 2 ?	YES	NO	✓
Critical Speed 2 Max	[illegible]	RPM	
Critical Speed 2 Min	[illegible]	RPM	

OPERATING PARAMETERS

Generator Application?	YES	NO	✓
Use Gen Brkr Open Trip ?	YES	NO	✓
Use Tie Brkr Open Trip ?	YES	NO	✓
Use KW Droop?	YES	NO	✓
KW Max Load	2000.	KW	
Droop (%)	5.0	%	
Rated Spd Setpt	3600.	RPM	
Use Freq Arm/Disarm ?	YES	NO	✓
Use Local/Remote	YES	NO	✓

DRIVER CONFIGURATION

Act #1 is 4-20mA?	YES ✓	NO	
Invert Driver Outputs ?	YES	NO	✓
Use Act 1 Flt Shutdown	YES ✓	NO	
Act #1 Dither	0.	%	
Use Actuator #2?	YES	NO	✓
Act #2 is 4-20mA?	YES	NO	✓
Act #2 Offset (%)	0.	%	
Use Act 2 Flt Shutdown	YES ✓	NO	
Act #2 Dither (%)	0.	%	
Use Act #2 as Readout?	YES	NO	✓
Act #2 Readout is:	—	%	
Readout 4mA Value	0	Units	
Readout 20mA Value	0	Units	

ANALOG INPUTS

Analog Input # 1 Function	—	
Input 1 4mA Value	0.	Units
Input 1 20mA Value	100.	Units
Analog Input # 2 Function	—	
Input 2 4mA Value	0.	Units
Input 2 20mA Value	[illegible]	Units
Analog Input # 3 Function	—	
Input 3 4mA Value	[illegible]	Units
Input 3 20mA Value	[illegible]	Units
Analog Input # 4 Function	—	

Input 4 4mA Value ___0.___ Units
Input 4 20mA Value ___100.___ Units
Analog Input # 5 Function ___—___
Input 5 4mA Value ___0.___ Units
Input 5 20mA Value ___[illegible]___ Units
Analog Input # 6 Function ___—___
Input 6 4mA Value ___0.___ Units
Input 6 20mA Value ___[illegible]___ Units

CONTACT INPUTS

Contact Input 1 Function ___—___
Contact Input 2 Function ___—___
Contact Input 3 Function ___—___
Contact Input 4 Function ___—___
Contact Input 5 Function ___—___
Contact Input 6 Function ___—___
Contact Input 7 Function ___—___
Contact Input 8 Function ___—___
Contact Input 9 Function ___—___
Contact Input 10 Fctn ___—___
Contact Input 11 Fctn ___—___
Contact Input 12 Fctn ___—___

FUNCTION KEYS

F3 Key Performs ___—___
Blink when not Active? .....YES ___ NO ✓
F4 Key Performs ___—___
Blink when not Active? .....YES ___ NO ✓

AUXILIARY CONTROL

Use Auxiliary Control ? .....YES ___ NO ✓
Lost Aux Input Shutdown?.....YES ___ NO ✓
Use KW Input ? .....YES ___ NO ✓
Invert Aux ? .....YES ___ NO ✓
Min Aux Setpt ___0.___ Units
Max Aux Setpt ___100.___ Units
Aux Setpt Rate units/sec ___5.___ Units / SEC
Use Aux Enable? .....YES ___ NO ✓
Setpt Initial Value ___0.___ Units
Aux Droop ___0.___ %
Aux PID Prop Gain ___1.0___ %
Aux PID Integral Gain ___0.3___ rps
Aux Derivative Ratio ___100.___ %
Tiebrkr Open Aux Disable .....YES ✓ NO ___
Genbrkr Open Aux Disable .....YES ✓ NO ___
Use Remote Aux Setting..... YES ___ NO ✓
Remote Aux Max Rate ___5.0___ Units / SEC
Aux Units of Measure ___—___

CASCADE CONTROL

Use Cascade Control? .....YES ___ NO ✓
Invert Cascade ? .....YES ___ NO ✓
Min Cascade Setpt ___0.___ Units
Max Cascade Setpt ___[illegible]___ Units

Casc Setpt Rate (/sec) ___5.___ Units/SEC
Use Setpoint Tracking ? .....YES ___ NO ✓
Setpt Initial Value ___[illegible]___ Units
Speed Setpt Lower Limit ___[illegible]___ RPM
Speed Setpt Upper Limit ___3[illegible]0.___ RPM
Max Speed Rate(RPM/sec) ___[illegible]___ RPM/Sec
Cascade Droop ___0.___ %
Casc PID Prop Gain ___3.0___ %
Casc PID Integral Gain ___.3___ rps
Casc Derivative Ratio ___100___ %
Use Remote Casc Setting .....YES ___ NO ✓
Remote Casc Max Rate ___5.0___ Units/SEC
Casc Units of Measure ___—___

READOUTS

Analog Readout 1 Is ___—___
Readout 1 4mA Value ___0.___ Units
Readout 1 20mA Value ___100.___ Units
Analog Readout 2 Is ___—___
Readout 2 4mA Value ___0.___ Units
Readout 2 20mA Value ___100___ Units
Analog Readout 3 Is ___—___
Readout 3 4mA Value ___0___ Units
Readout 3 20mA Value ___[illegible]___ Units
Analog Readout 4 Is ___—___
Readout 4 4mA Value ___0.___ Units
Readout 4 20mA Value ___[illegible]___ Units
Analog Readout 5 Is ___—___
Readout 5 4mA Value ___0___ Units
Readout 5 20mA Value ___[illegible]___ Units
Analog Readout 6 Is ___—___
Readout 6 4mA Value ___0.___ Units
Readout 6 20mA Value ___[illegible]___ Units

RELAYS

Use Relay #1? .....YES ___ NO ✓
Relay # 1 is Level Switch?.....YES ___ NO ___
Relay 1 Is Level Sw For ___
Relay 1 ON Level ___ Units
Relay 1 OFF Level ___ Units
Relay 1 Energizes On ___
Use Relay # 2? .....YES ___ NO ✓
Relay # 2 is Level Switch?.....YES ___ NO ___
Relay 2 Is Level Sw For ___
Relay 2 On Level ___ Units
Relay 2 Off Level ___ Units
Relay 2 Energizes On ___
Use Relay # 3? .....YES ___ NO ✓
Relay # 3 is Level Switch?.....YES ___ NO ___
Rly 3 Is Level Sw For ___
Relay 3 On Level ___ Units
Relay 3 Off Level ___ Units
Relay 3 Energizes On ___
Use Relay # 4? .....YES ___ NO ✓

Relay # 4 is Level Switch?.....YES ____NO ✓
Rly 4 Is Level Sw For _____
Relay 4 On Level _____Units
Relay 4 Off Level _____Units
Relay 4 Energizes On _____
Use Relay # 5? .....YES ____NO ✓
Relay # 5 is Level Switch?.....YES ____NO _____
Rly 5 Is Level Sw For _____
Relay 5 On Level _____Units
Relay 5 Off Level _____Units
Relay 5 Energizes On _____
Use Relay # 6? .....YES ____NO ✓
Relay # 6 is Level Switch?.....YES ____NO _____
Rly 6 Is Level Sw For _____
Relay 6 On Level _____Units
Relay 6 Off Level _____Units
Relay 6 Energizes On _____

COMMUNICATIONS
Use Communications ? .....YES _____NO ✓
Use Modbus Port 1? .....YES _____NO _____
Mode Ascii=1 Rtu=2 _____
Modbus Device # _____
Port #1 Driver _____
Port #1 Baud Rate _____
Port #1 Stop Bits _____
Port #1 Parity _____
Use Modbus Port 2? .....YES _____NO _____
Mode Ascii=1 Rtu=2 _____
Modbus Device # _____
Port #2 Driver _____
Port #2 Baud Rate _____
Port #2 Stop Bits _____
Port #2Parity _____

505 SERVICE MODE WORKSHEET

APPLICATION NUMBER 9205046 Turbine/Generator

GOVERNOR SERIAL NUMBER 1230 1274 DATE 24-Aug-99

For details on individual settings, refer to Chapter 4.

SPEED CONTROL SETTINGS

Rate to Min = 50. RPM/SEC
Slow Rate /sec = 25. RPM/SEC
Fast Rate Dly = 3. SEC
Fast Rate = 75. RPM/SEC
Entered Rate = 25. RPM/SEC
Underspd Setting = 4750. RPM
On-line Deriv Ratio= 5.0 %
Off-line Deriv Ratio = 5.0 %
Hold Speed Chng ..... Yes ___ No ✓

ALARM SETTINGS

Is Trip an Alarm ..... Yes ✓ No ___
Blink Alarms ..... Yes ___ No ✓
Jump to Alm Scrn ..... Yes ___ No ✓

KEY OPTIONS

Use 'Stop' Cmd ..... Yes ✓ No ___
Use Dyn Key Adj ..... Yes ✓ No ___

SPD CNTRL DROOP SETTINGS (if generator)

Droop (%) = ___ %
Use KW Droop? ..... Yes ___ No ___
Gen Load Units = MW ..... Yes ___ No ___

MPU OVERRIDE

Use MPU Ovrd Tmr? ..... Yes ✓ No ___
MPU Ovrd Time = 60. Sec
MPU #1 Ovrd On ..... (Status Only)
MPU #2 Ovrd On ..... (Status Only)

AUTO START SEQUENCE (if configured)

Low Idle Delay ..... (status only - MIN)
Rate To Hi Idle ..... (status only - RPM/SEC)
Hi Idle Delay ..... (status only - MIN)
Rate To Rated ..... (status only - RPM/SEC)
Hrs Since Trip ..... (status only - HRS)

IDLE / RATED SETTINGS (if configured)

Idle/Rated Rate = ___ RPM/SEC
Use Ramp To Idle ..... Yes ___ No ___
Idle Priority? ..... Yes ___ No ___

SYNC/LD SHARE SETTINGS (if configured)

Input Bias Gain = ___ %
Input Bias Dband = ___ RPM
Lag-Tau Value = ___ %
Hold Bias Chng ..... Yes ___ No ___

REMOTE SPEED SETTINGS (if configured)

Not Mtchd Rate = ___ RPM/SEC
Spd Setpt Mx Rte = ___ RPM/SEC
Min Speed Set = ___ RPM
Max Speed Set = ___ RPM
Rmt Dbnd Value = ___ RPM
Lag-Tau Value = ___ %
Use Min Load? ..... Yes ___ No ___
Hold Rmt Chng ..... Yes ___ No ___

CASCADE CTRL SETTINGS (if configured)

Slow Rate (/Sec) = ___ UNITS/SEC
Fast Rate Delay = ___ SEC
Setpt Fast Rate = ___ UNITS/SEC
Septpt Entrd RatE = ___ UNITS/SEC
Droop (%) = ___ %
Rated Casc Setpt = ___ UNITS
Casc N Mtchd Rte = ___ UNITS
Max Speed Rate = ___ RPM/SEC
Max Speed Set = ___ RPM
Min Speed Set = ___ RPM
Cascade Dbnd = ___ UNITS
Casc Deriv Ratio = ___ %
R/L Casc Only? ..... Yes ___ No ___
Use Min Load? ..... Yes ___ No ___
Hold Casc Chng ..... Yes ___ No ___

REMOTE CASC SETTINGS (if configured)

Rmt N Mtchd Rte = ___ UNITS/SEC
Rmt Casc Max Rte = ___ UNITS/SEC
Min Casc Set = ___ UNITS
Max Casc Set = ___ UNITS
Rmt Dbnd Value = ___ UNITS
Lag-Tau Value = ___ SEC
Hld Rmt Cas Chng ..... Yes ___ No ___

AUX CONTROL SETTINGS (if configured)

Slow Rate (/Sec) = ___ UNITS/SEC
Fast Rate Delay = ___ SEC
Setpt Fast Rate = ___ UNITS/SEC
Setpt Entrd Rate = ___ UNITS/SEC
Droop (%) = ___ %
Rated Aux Setpt = ___ UNITS
Aux Deriv Ratio = ___ %
Aux Threshold = ___ %
PID Min Output = ___ %
Hold Aux Chng ..... Yes ___ No ___

REMOTE AUX SETTINGS (if configured)

Rmt N Mtchd Rte = ___ UNITS/SEC
Rmt Aux Max Rate = ___ UNITS/SEC
Min Rmt Aux Set = ___ UNITS
Max Aux Set = ___ UNITS
Rmt Dbnd Value = ___ UNITS
Lag-Tau Value = ___ %
Hold Rmt Aux Chng ..... Yes ___ No ___

BREAKER LOGIC (if generator)
Freq Cntrl Armd .....(status only)
Sync Window Rpm = _____RPM
Sync Window Rate = _____RPM/SEC
Tiebrkr Opn Rmp.....Yes ____ No ____
Tie Open Rate = _____RPM/SEC
Gen Open Setback .....Yes ____ No ____
Gen Open Setpt = _____RPM
Use Min Load .....Yes ____ No ____
Min Load Bias = _____RPM
Zero Load Value = _____%
Hold Brkr Chng.....Yes ____ No ____

VALVE LIMITER SETTINGS
Limiter Rate = 5.0 %/SEC
Entered Rate = 5.0 %/SEC
Limiter Max Limit = 100. %
Hold Limiter Chng .....Yes ____ No ✓

LOCAL / REMOTE FUNCTIONS (if configured)
Remote Enabled .....(status only)
Enable Contacts.....Yes ____ No ____
Contacts Enabled .....(status only)
Enable Modbus 1.....Yes ____ No ____
Modbus 1 Enabled .....(status only)
Enable Modbus 2.....Yes ____ No ____
Modbus 2 Enabled .....(status only)

MONITOR CONTACT INPUTS
ESD Input Clsd .....(status only)
Rst Input Clsd .....(status only)
Rse Spd In Clsd .....(status only)
Lwr Spd In Clsd .....(status only)
Cont In #1 Closed.....(status only)
Cont In #2 Closed.....(status only)
Cont In #3 Closed.....(status only)
Cont In #4 Closed.....(status only)
Cont In #5 Closed.....(status only)
Cont In #6 Closed.....(status only)
Cont In #7 Closed.....(status only)
Cont In #8 Closed.....(status only)
Cont In #9 Closed.....(status only)
Cont In #10 Closed.....(status only)
Cont In #11 Closed.....(status only)
Cont In #12 Closed.....(status only)

MONITOR RELAY OUTPUTS
Sht Dn Rly Enrgzd.....(status only)
Alrm Rly Enrgzd.....(status only)
Relay 1 Enrgzd.....(status only)
Relay 2 Enrgzd.....(status only)
Relay 3 Enrgzd.....(status only)
Relay 4 Enrgzd.....(status only)
Relay 5 Enrgzd.....(status only)
Relay 6 Enrgzd.....(status only)

FORCE RELAY OUTPUTS (if shut down)
Force Relays ?.....(troubleshooting only)
Force Rlys Enbl .....(status only)
Shutdn Rly .....(troubleshooting only)
Force Alarm Rly On? .....(troubleshooting only)
Relay #1 On .....(troubleshooting only)
Relay #2 On.....(troubleshooting only)
Relay #3 On.....(troubleshooting only)
Relay #4 On.....(troubleshooting only)
Relay #5 On.....(troubleshooting only)
Relay #6 On.....(troubleshooting only)
Turn On LED's .....(troubleshooting only)
LED's ON Status .....(status only)

MONITOR SPEED INPUTS
Speed Input #1 = ...(status only)
Speed Input #2 = ...(status only)

MONITOR ANALOG INPUTS
Anlg In #1 (%) =.....(status only)
Anlg In #2 (%) = ...(status only)
Anlg In #3 (%) = ...(status only)
Anlg In #4 (%) =.....(status only)
Anlg In #5 (%) = ...(status only)
Anlg In #6 (%) = ...(status only)

ANALOG IN ADJUSTMENTS
Input #1 Offset = _____
Input #1 Gain = _____
Input #2 Offset = _____
Input #2 Gain = _____
Input #3 Offset = _____
Input #3 Gain = _____
Input #4 Offset = _____
Input #4 Gain = _____
Input #5 Offset = _____
Input #5 Gain = _____
Input #6 Offset = _____
Input #6 Gain = _____

MONITOR ANALOG OUTPUTS
Anlg Out # 1 (mA) = ...(status only)
Anlg Out # 2 (mA) = ...(status only)
Anlg Out # 3 (mA) = ...(status only)
Anlg Out # 4 (mA) = ...(status only)
Anlg Out # 5 (mA) = ...(status only)
Anlg Out # 6 (mA) = ...(status only)

ANALOG OUTPUT ADJUSTMENTS
Out #1 Offset = _____
Out #1 Gain = _____
Out #2 Offset= _____
Out #2 Gain = _____
Out #3 Offset = _____
Out #3 Gain = _____
Out #4 Offset = _____
Out #4 Gain = _____
Out #5 Offset = _____
Out #5 Gain = _____
Out #6 Offset = _____
Out #6 Gain = _____

ACT1 LINEARIZATION

X-1 Value = _____
Y-1 Value = _____
X-2 Value = _____
Y-2 Value = _____
X-3 Value = _____
Y-3 Value = _____
X-4 Value = _____
Y-4 Value = _____
X-5 Value = _____
Y-5 Value = _____
X-6 Value = _____
Y-6 Value = _____
X-7 Value = _____
Y-7 Value = _____
X-8 Value = _____
Y-8 Value = _____
X-9 Value = _____
Y-9 Value = _____
X-10 Value = _____
Y-10 Value = _____
X-11 Value = _____
Y-11 Value = _____

ACT2 LINEARIZATION

X-1 Value = _____
Y-1 Value = _____
X-2 Value = _____
Y-2 Value = _____
X-3 Value = _____
Y-3 Value = _____
X-4 Value = _____
Y-4 Value = _____
X-5 Value = _____
Y-5 Value = _____
X-6 Value = _____
Y-6 Value = _____
X-7 Value = _____
Y-7 Value = _____
X-8 Value = _____
Y-8 Value = _____
X-9 Value = _____
Y-9 Value = _____
X-10 Value = _____
Y-10 Value = _____
X-11 Value = _____
Y-11 Value = _____

PORT 1 SETTINGS (if configured)

Port 1 Link Error _____ (status only)
Exception Error _____ (status only)
Error Code _____ (status only)
Use Modbus 1 Trip? _____ Yes ____ No ____
Use 2-Step Trip? _____ Yes ____ No ____
Enbl When Local _____ Yes ____ No ____
Trp Always Enbld _____ Yes ____ No ____

PORT 2 SETTINGS (if configured)

Port 2 Link Err ..... (status only)
Exception Error ..... (status only)
Error Code ..... (status only)
Use Mod 2 Trip ..... Yes ____ No ____
Use 2-Step Trp? ..... Yes ____ No ____
Enbl When Local ..... Yes ____ No ____
Trp Always Enbld ..... Yes ____ No ____

COMM ANALOG SCALING (if using modbus)

Cas Scale Factor = _____
Aux Scale Factor = _____
KW Scale Factor = _____
FSP Scale Factor = _____
Load Share Scale = _____

PORT CONFIGURATIONS

PORT 1 SETTINGS
- STATUS ..... (status only)
- BAUD = _____
- STOP BITS = _____
- PARITY = _____
- DRIVER = _____
- ASCII OR RTU = _____
- MODBUS DEVICE # = _____
- TIME OUT DELAY (SEC) = _____

PORT 2 SETTINGS
- STATUS ..... (status only)
- TOP BITS = _____
- PARITY = _____
- DRIVER = _____
- ASCII OR RTU = _____
- MODBUS DEVICE # = _____
- TIME OUT DELAY (SEC) = _____

PC PORT SETTINGS
- STATUS ..... (status only)
- BAUD = _____
- STOP BITS = _____
- PARITY = _____
- DRIVER = _____