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Spy Pro ESP Monitoring Peripheral

AUG 9th , 2022

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1. Scada System
2. Modbus, Data Pro
3. Communication ports
4. Modbus Maps (pre-configurated)
5. Example w/FIC & Modbus Poll
6. Modbus Devices Tab
7. Wiring
8. Flies *.mbm
9. Data Pro as Master

1. Scada Sytem

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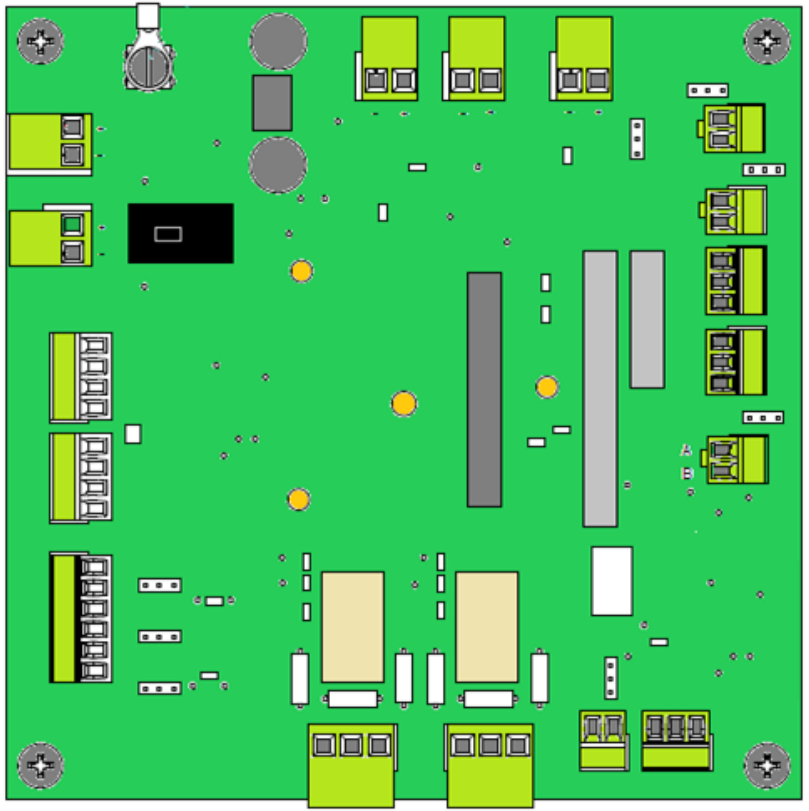
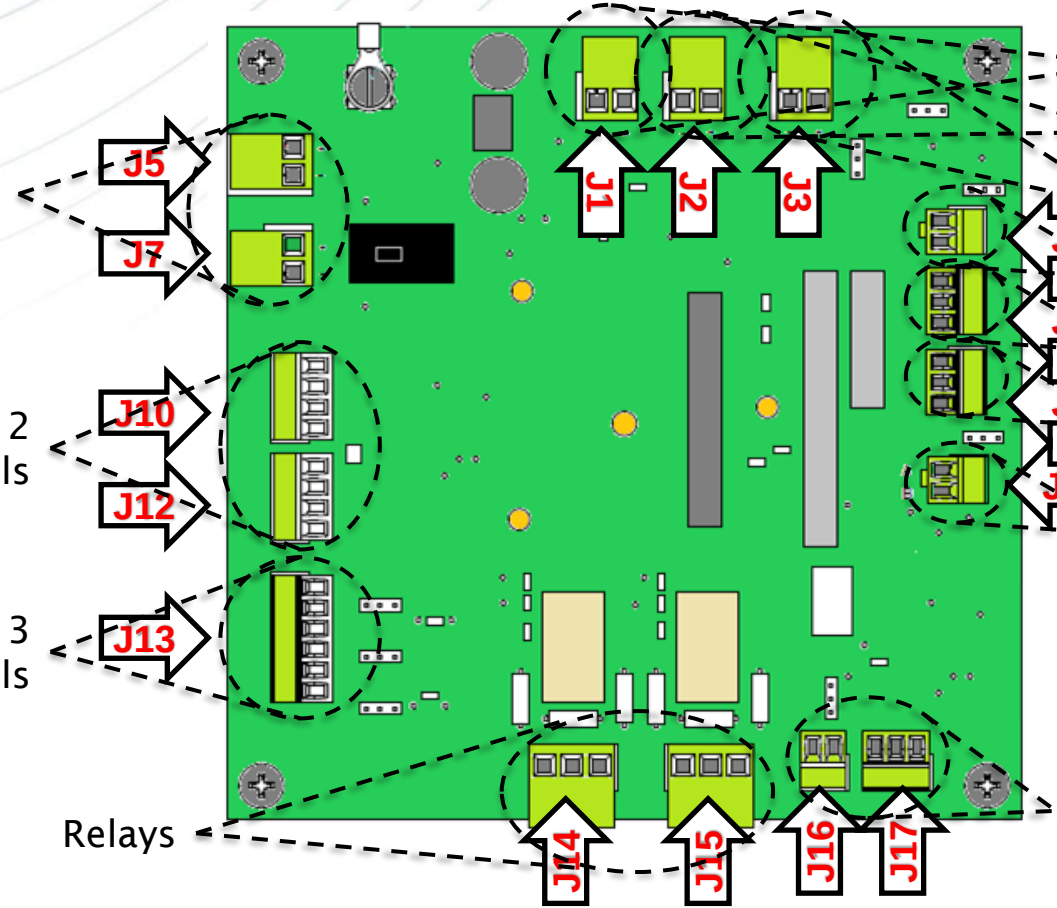
Data Pro Peripheral Connections

Connector	Description
J14, J15	Alarm/Relays
JP5, JP6, JP7	Analog input voltage/current selection
J13	Analog input – 3 channels
J12, J10	Analog outputs – 2 channels
J5, J7	DC power input
ST1	Earth ground screw for input power
J2, J3	Power connection for SPS or FIC's
J6	COM3 – RS-485 Modbus slave
J8	COM2 – RS-232 Modbus slave
J11	COM5 – Reserved for SPS/FIC Modbus Connection
J17, J16	COM1 – RS-232/RS-485 Modbus port



Data Pro Peripheral Connections



DC Power input

Analog Output – 2 channels

Analog input – 3 channels

Relays

Panel - DC Power

Power Conn for SPS/FIC

Power Conn for 2nd FIC

COM3: RS-485 Modbus

COM2: RS-232 Modbus

COM4: RS-232 Modbus

COM5: RS-485 Modbus

COM1: RS-232/RS-485 Modbus port

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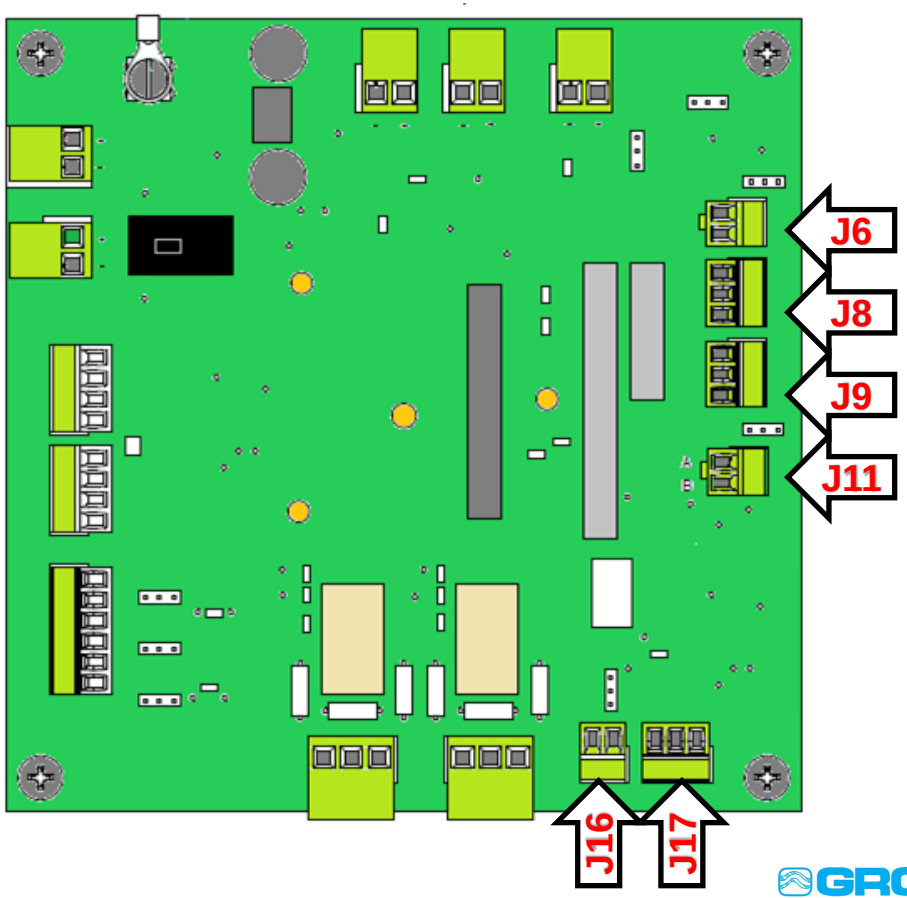
Modbus ports - Data Pro

COM 1	ISO RS485	J16
	ISO RS232	J17
COM 2	RS232	J8
COM 3	RS485	J6
COM 4	RS232	J9
COM 5	RS485	J11
ETH 1	TCP/IP ModBus	
ETH 2	TCP/IP ModBus	



Modbus Maps - Data Pro

1. DL4200 – (Default map) – (**Table 10**)
2. SPS-1500 - (**Table 11**)
3. FIC - (**Table 12**)
4. SCOUT-3000 - (**Table 13**)

15.0 Appendix 4: Impersonated Scout-3000 Modbus Map

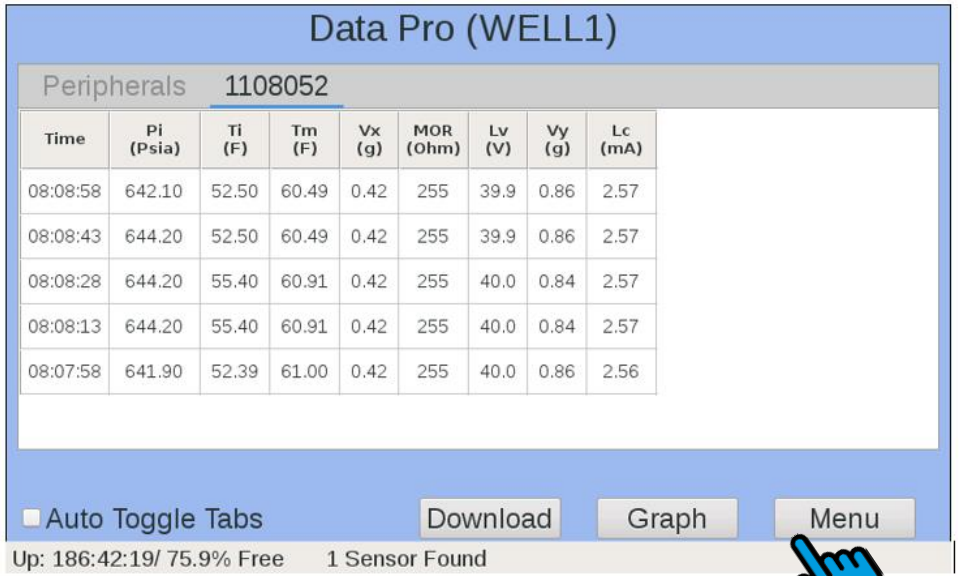
Version = 1.0

WordOrder = High/Low

Register	Register Name	Register Type	Decimal Places	Register Units	Comments
40033	Gauge[1].LastPacketTime	long	1		
40035	Gauge[1].PacketCount	long	0		
40037	Gauge[1].IntakeTemperature	int	1		
40038	Gauge[1].IntakePressure	int	1		
40039	Gauge[1].DischargeTemperature	int	1		
40049	Gauge[1].DischargePressure	int	1		
40041	Gauge[1].MotorTemp	int	1		
40042	Gauge[1].VibrationX	int	2		
40043	Gauge[1].Wye	int	0		
40044	Gauge[1].Conductivity	int	0		
40045	Gauge[1].ToolVoltage	int	1		
40046	Gauge[1].VibrationY	int	2		
40047	Gauge[1].LeakageCurrent	int	2		
40048	Gauge[1].VibrationZ	int	2		

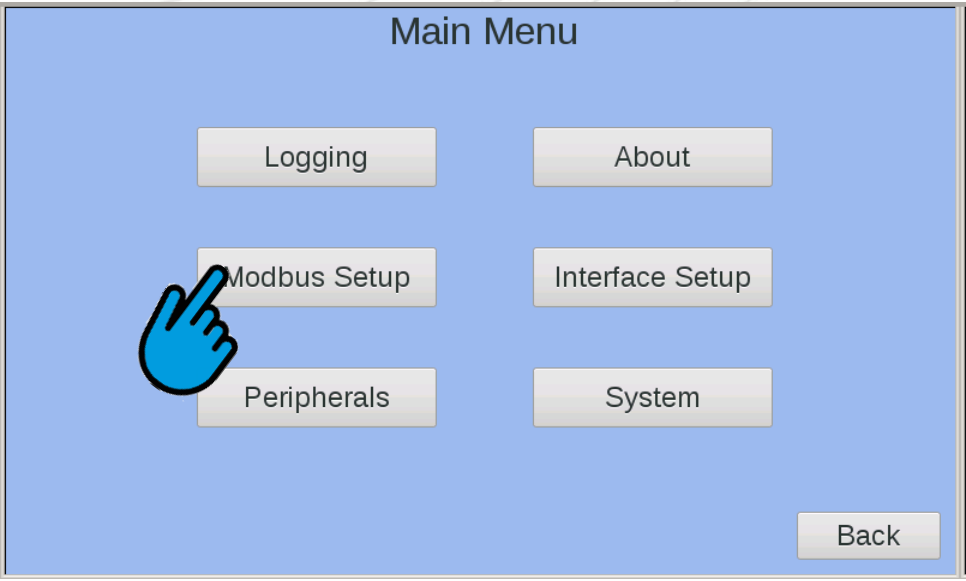
Table 13 – Impersonated Scout-3000 Modbus Map

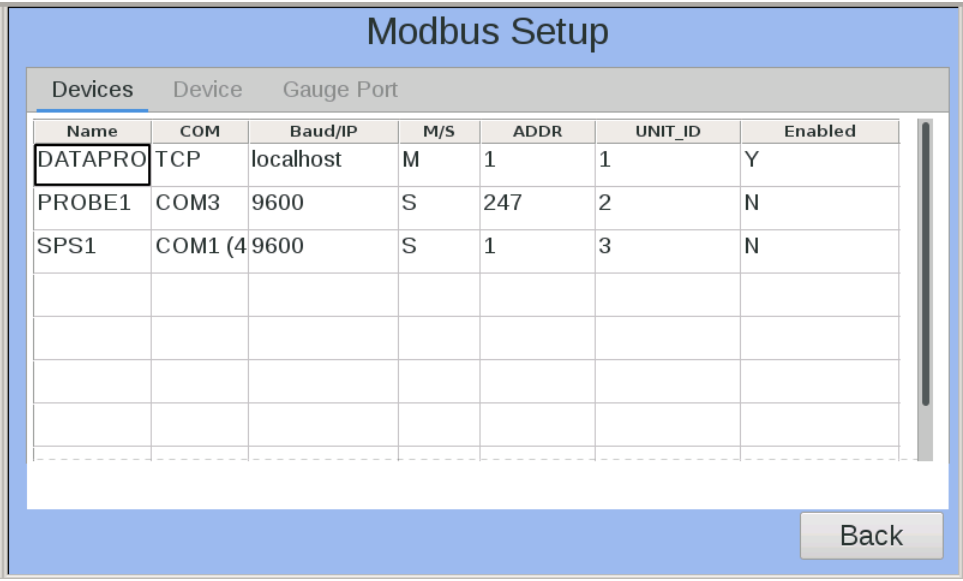
How config



Password: **1234**

How config





How config

Name: The name of a Modbus device must be unique and cannot contain spaces. The name of the device is used as the file name for the data collected and for reference in other parts of the program.

COM: COM will show where the device is connected it will show either the com port number or TCP.

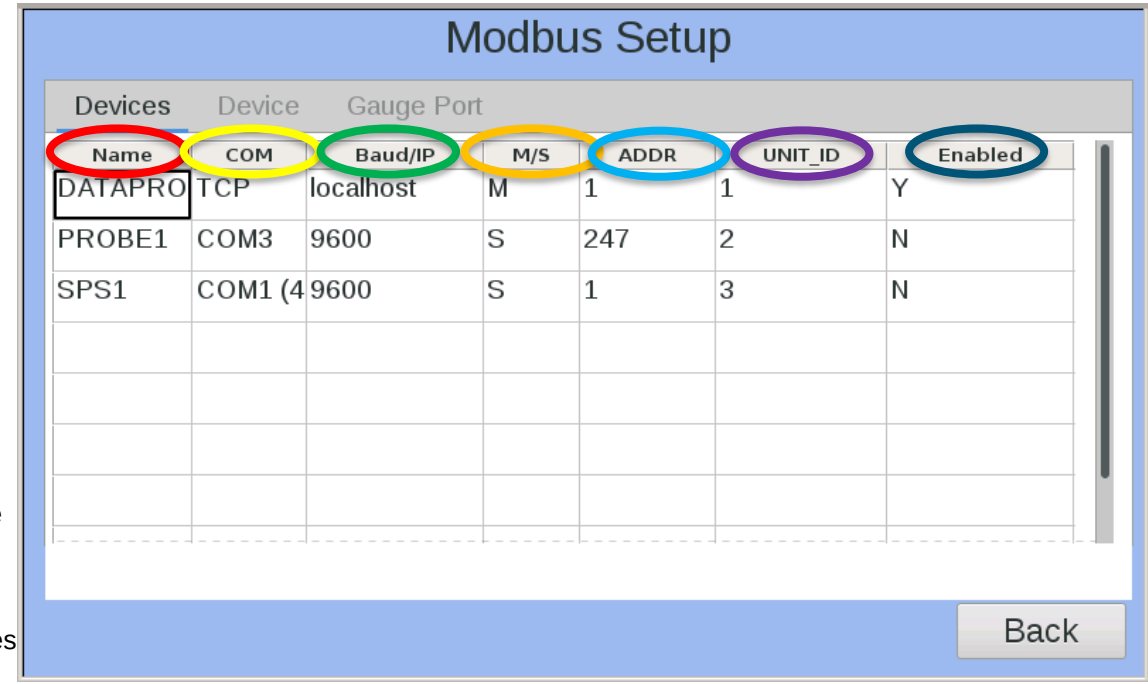
Baud/IP: If the device is a serial type device, this field will show the baud rate. If the device is a TCP/IP device, the IP address (or as 'localhost') will be shown.

M/S: This field indicates whether the device is a Master or Slave. If the field is set to "S" (slave) then the Data Pro will actively poll that device if a Modbus map is set. If it is set to "M" (master) then the Data Pro will maintain the map and make it available for polling through an unassigned COM or Ethernet port. When "M" is used set the COM to 'TCP' and IP to 'LOCALHOST'.

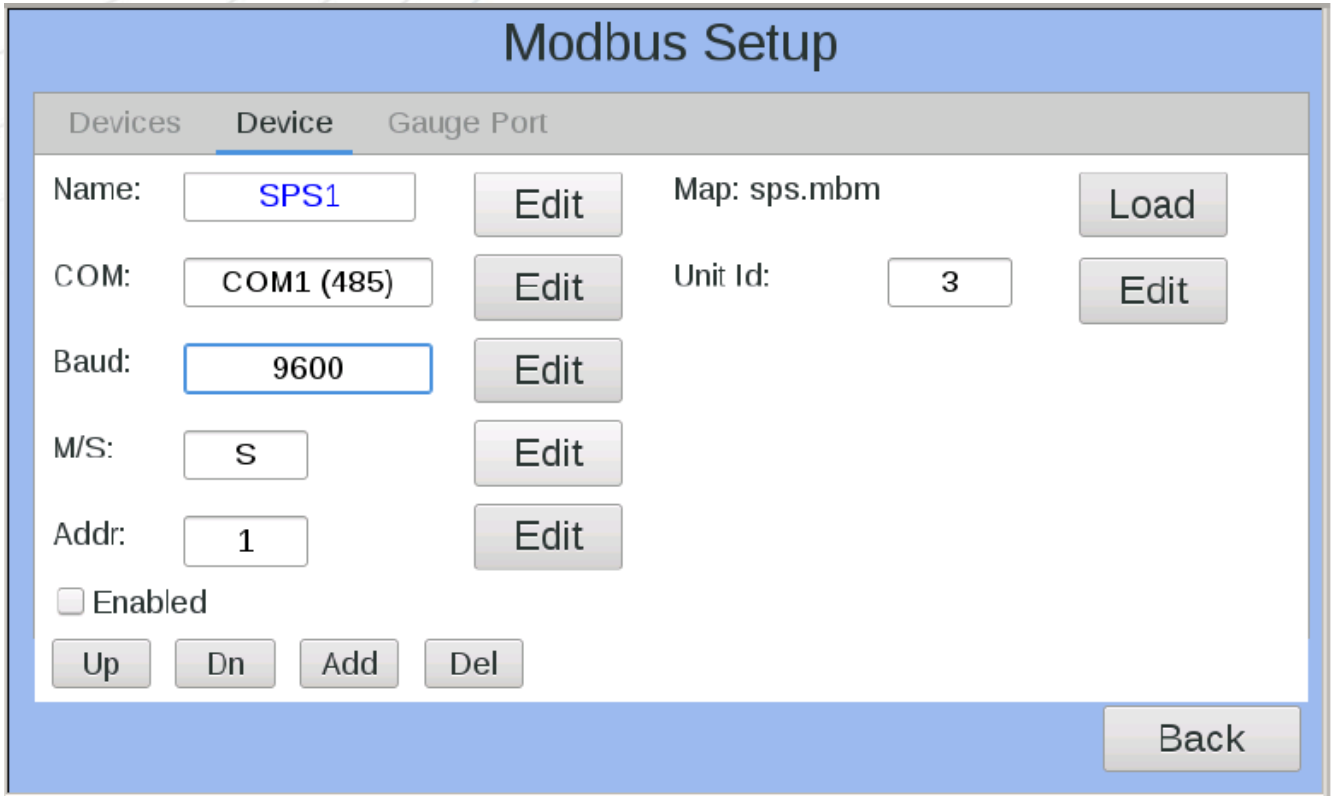
ADDR: This field displays the Modbus slave address that the Data Pro will use to communicate with an attached device.

Unit_ID:
This field displays the address, which an external master uses to poll/command the attached device.

Enabled:
This field indicates whether the device is active or inactive.



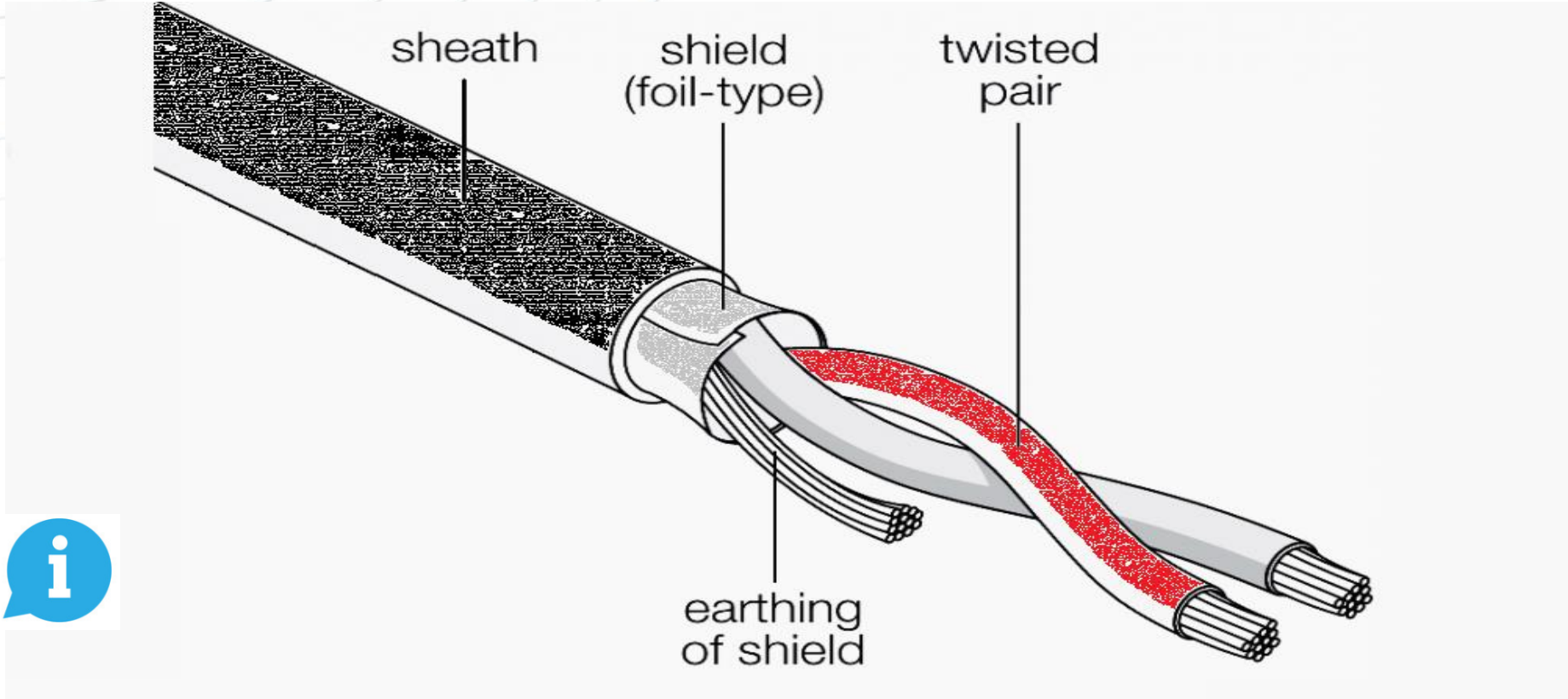
How config



Modbus Wiring

- Each device has a communication port with these terminals, which are indicated for convenience as A and B. In two terminals, the communication cable is connected so that all the devices participating in the communication are connected in parallel.
- Reversing the "A" and "B" connections of a device not only prevents it from communicating, but can also stop the entire communication system from functioning due to incorrect forward voltage (bias) found at the device terminals incorrectly connected.
- To avoid errors when connecting many devices, use wires of the same color for all connections to terminals A and wires of the same color for all connections to terminals B of different devices (eg White for A and blue for B).

Modbus cable



Data Pro as Master

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Modbus - Data Pro

Define port to connect

COM 1	ISO RS485 J16
	ISO RS232 J17
COM 2	RS232 J8
COM 3	RS485 J6
COM 4	RS232 J9
COM 5	RS485 J11 (dedicado a FIC/SPS)

Load * .mbm file (ModBus map of the slave device)

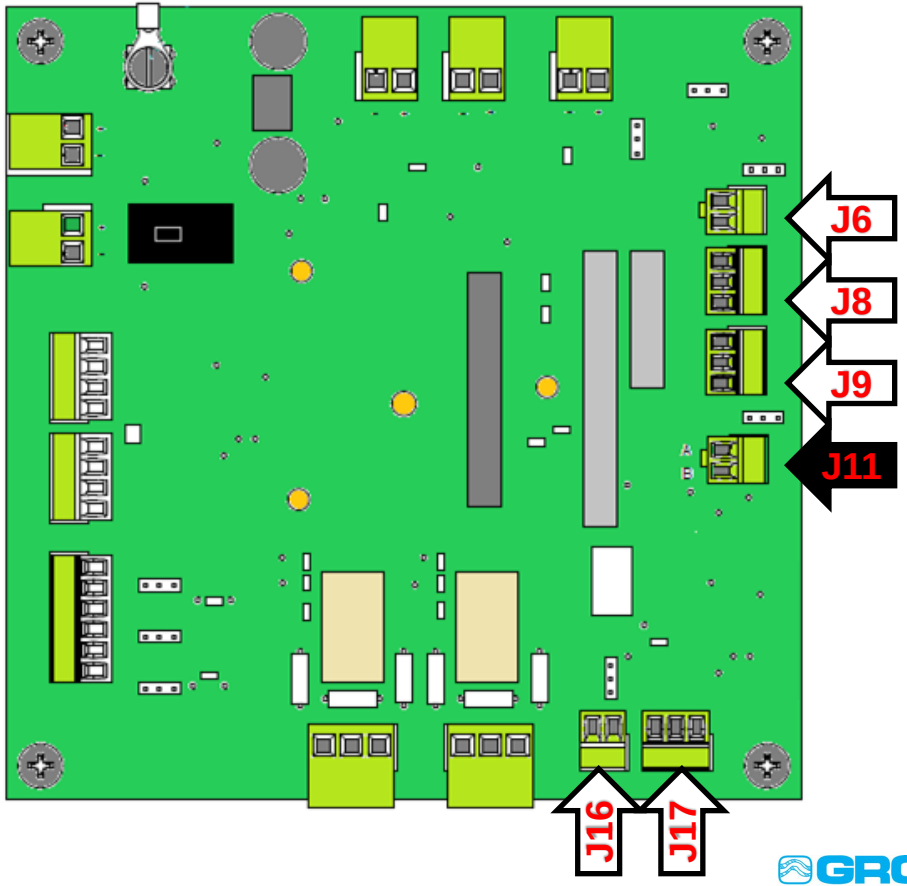
For it:

Set function

typeAddresses / registers

Parameter length

Device ID



Set as Master

*TestSpyPro30000 - Notepad

File Edit Format View Help

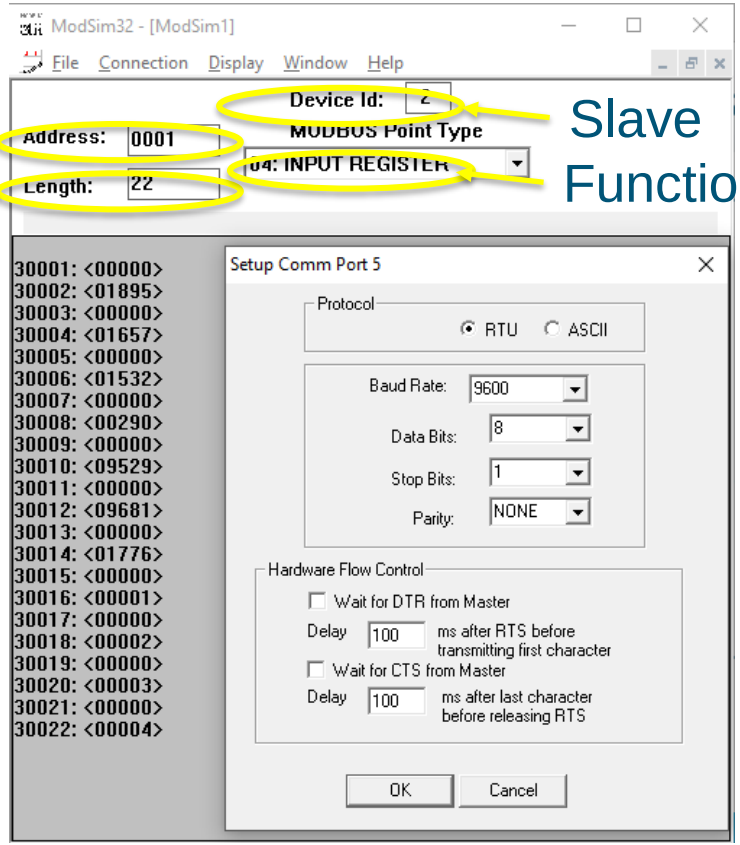
```
#Ver 1.11
#Map Header Defines
[Map]
Ver = 1.0
WordOrder= High
Device=Test
Name=TestSpyPro
Model=Test
InputRegStart= 30001
InputRegFrom = 30001
InputRegTo = 33999
RefreshRate=5000
Description=DataPro

[Registers]
#Reg,ParamName, Type (bits_0xMask,byte##,int,long,float), DecPlaces=0, Units='', Description=''
30001,Pres_Int,long, 1, psi
30003,Pres_Dis,long, 1, psi
30005,Temp_Int,long, 1, F
30007,Temp_Mot,long, 1, F
30009,Vib_X,long, 3, G
30011,Vib_Y,long, 3, G
30013,Vib_Z,long, 3, G
30015,Lin_Volt,long, 1, V
30017,Leak_Current,long, 1, mA
30019,Wye_Volt,long, 1, V
```

Address

Length

Slave Function



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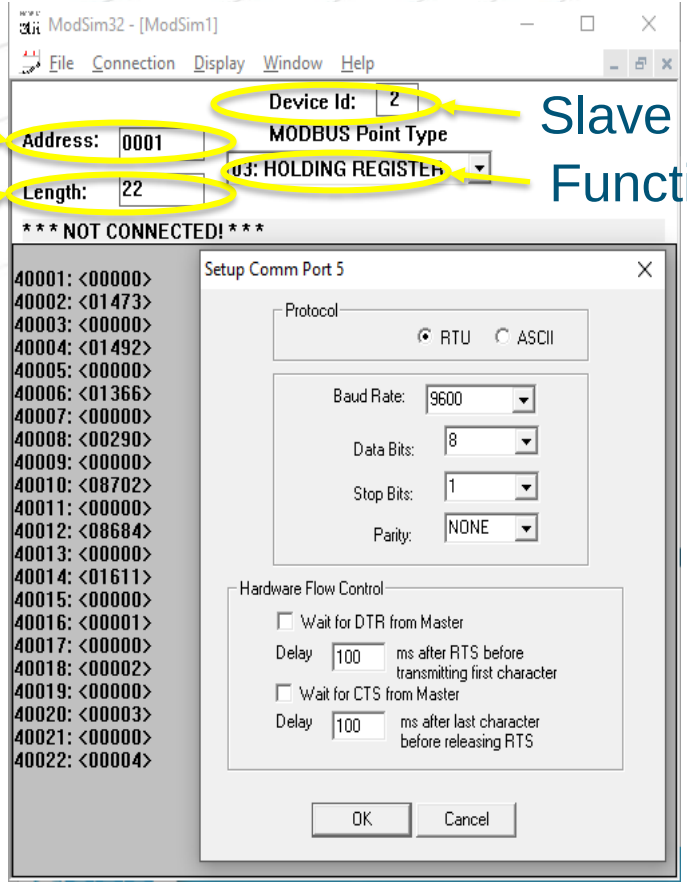
Set as Master

Address

Length

Slave Function



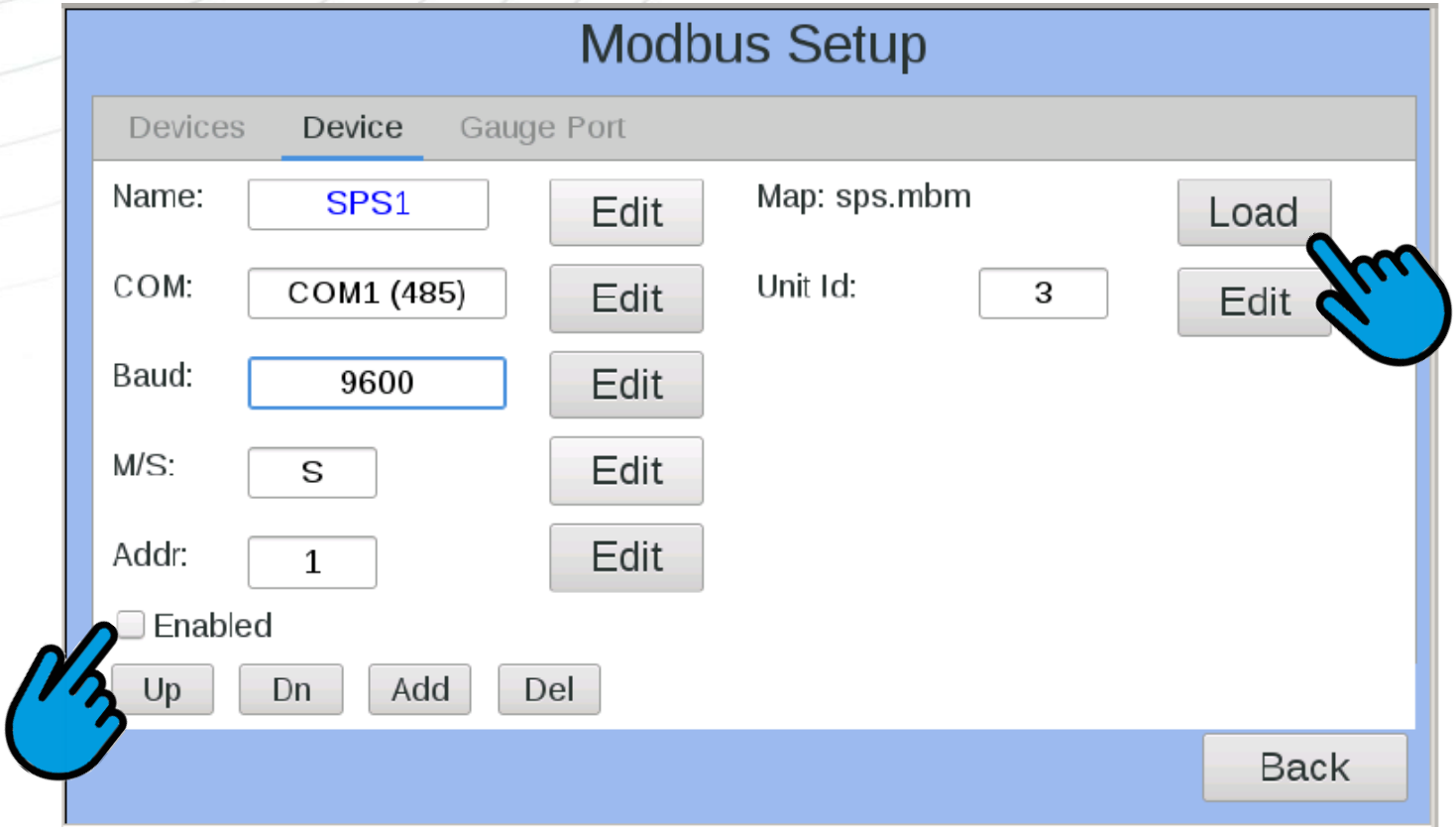
TestSpyPro40000a - Notepad

File Edit Format View Help

```
#Ver 1.11
#Map Header Defines
[Map]
Ver= 1.0
WordOrder= High
Device=Test
Name=TestSpyPro4xa
Model=Test
HoldingRegStart= 40001
HoldingRegFrom = 40001
HoldingRegTo = 41729
RefreshRate=5000
Description=DataPro

[Registers]
#Reg,ParamName, Type (bits_0xMask,byte##,int,long,float), DecPlaces=0, Units='', Description=''
40001,Pres_Int,long, 1, psi
40003,Pres_Dis,long, 1, psi
40005,Temp_Int,long, 1, F
40007,Temp_Mot,long, 1, F
40009,Vib_X,long, 3, G
40011,Vib_Y,long, 3, G
40013,Vib_Z,long, 3, G
40015,Lin_Volt,long, 1, V
40017,Leak_Current,long, 1, mA
40019,Wye_Volt,long, 1, V
```

Set as Master



Mbpoll1 SPS-1500

Modbus Poll - [Mbpoll1 FIC-1500 (1 gauge)]

File Edit Connection Setup Functions Display View Window Help

05 06 15 16 17 22 23 TC

Tx = 0: Err = 0: ID = 1: F = 03: SR = 1000ms

No connection

	Name	01000
1000		257
1001	Gauge Type	1
1002	Serial Number (int)	-20136
1003		20480
1004	Serial Type	0
1005	Packet Count	4097
1006		0
1007	Error Count	0
1008		2836
1009	Signal Current	0
1010	Last Packet Time	-24332
1011		0
1012	41012- Pressure	605
1013		0
1014	41014- Temperature	6951
1015		0
1016	41018-Vibration X	0
1017		0
1018	41018-Vibration Y	0
1019		0

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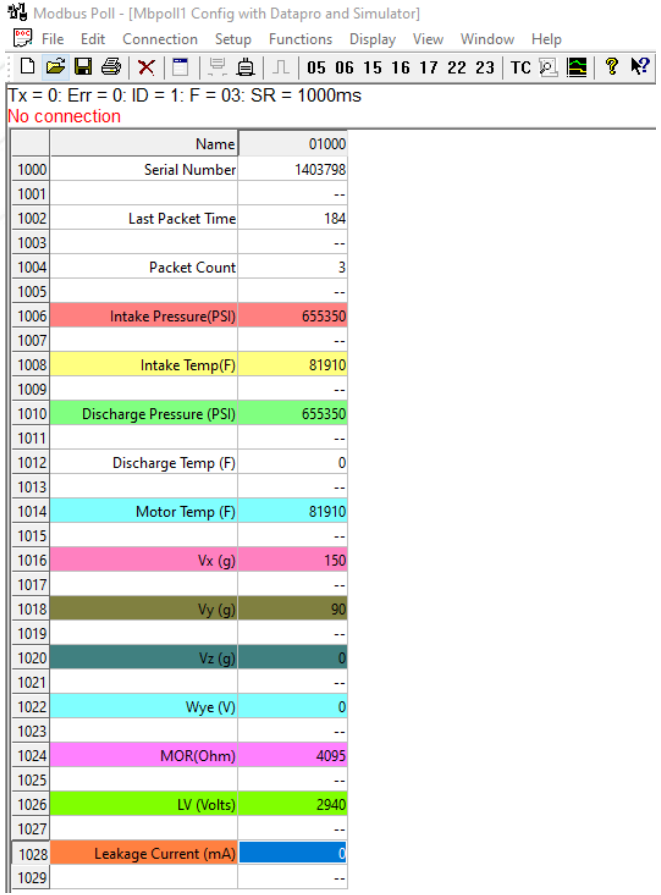
Mbpoll1 Data Pro and Simulator



	Name	01000
1000	Serial Number	1403798
1001		--
1002	Last Packet Time	184
1003		--
1004	Packet Count	3
1005		--
1006	Intake Pressure(PSI)	655350
1007		--
1008	Intake Temp(F)	81910
1009		--
1010	Discharge Pressure (PSI)	655350
1011		--
1012	Discharge Temp (F)	0
1013		--
1014	Motor Temp (F)	81910
1015		--
1016	Vx (g)	150
1017		--
1018	Vy (g)	90
1019		--
1020	Vz (g)	0
1021		--
1022	Wye (V)	0
1023		--
1024	MOR(Ohm)	4095
1025		--
1026	LV (Volts)	2940
1027		--
1028	Leakage Current (mA)	0
1029		--

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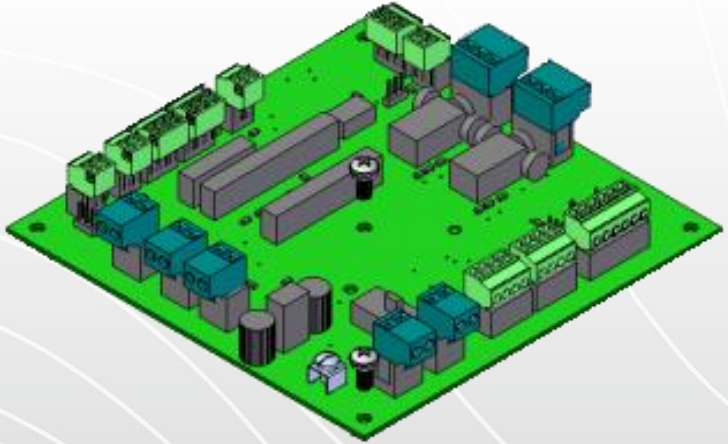

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Analog IO

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Input #1, 2, & 3 (Analog Input)

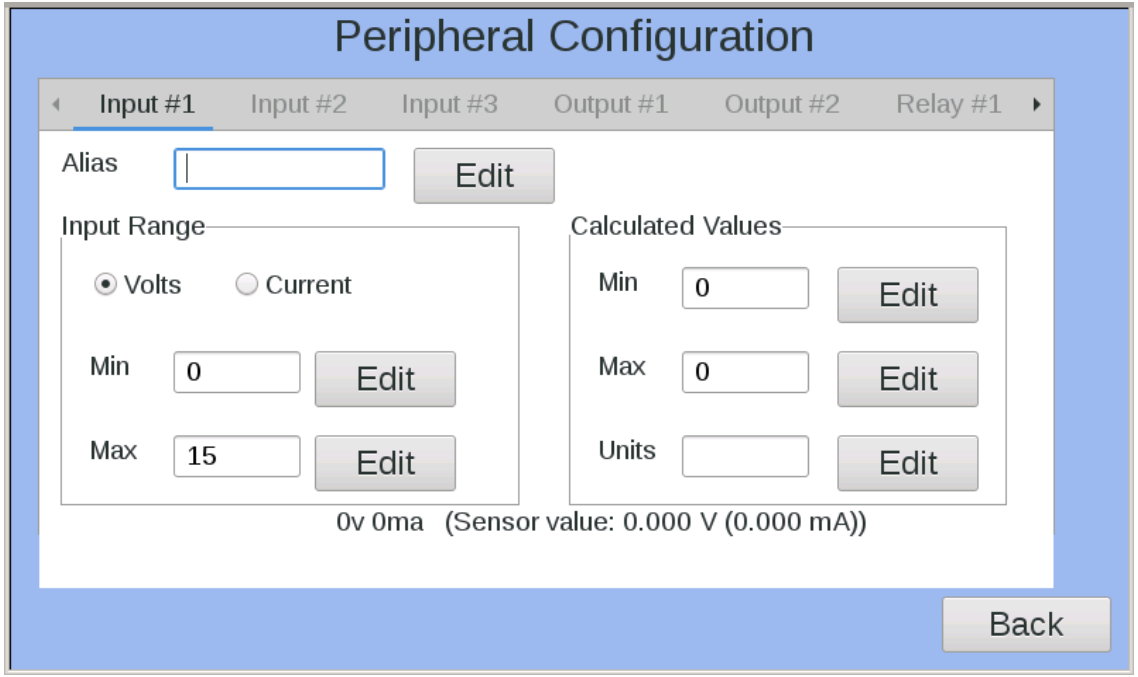
- The Data Pro has three (3) analog inputs that can be set to voltage or current and have scaling applied

Alias: The default name for this parameter is “Analog In”. The alias is an alternate name for the default
name referenced in the log files.

Input Range: The “Volts/Current” settings must match the jumper settings on the main board for accurate
value calculation. Enter a “Min” and “Max” reading for scaling.

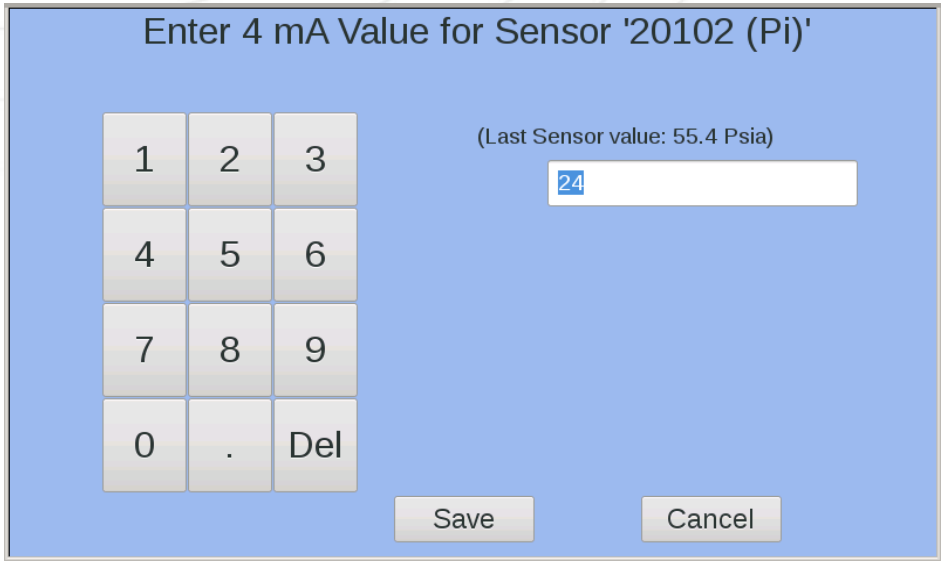
Calculated Values: These values represent the “Min/Max” values displayed and saved.

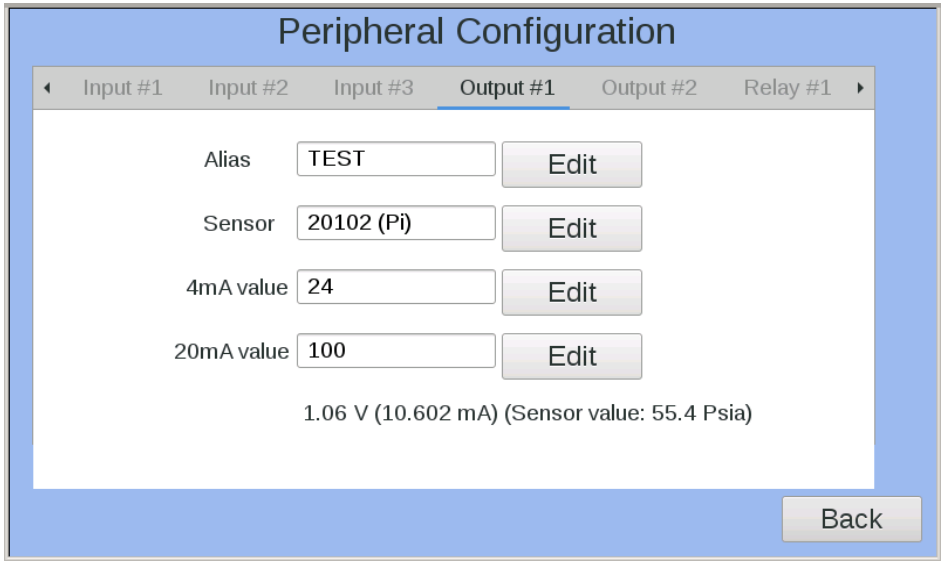
The units: is a free-hand field without calculation and can be used to identify the reading.



Output #1&2 (Analog Output (4-20mA))

- The Data Pro has three (2) analog Output (4-20mA)



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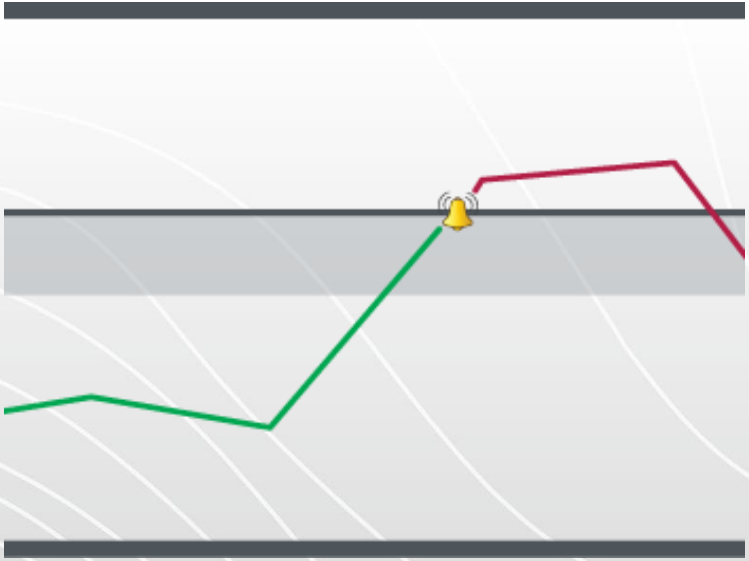

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Spy Pro ESP Monitoring Relay

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Relay Configuration for Alarm/Trip

- Data Pro configuration example given the following values:

- To configure Intake Pressure (Pi) and Motor Temperature (Tm) as an alarm parameter.

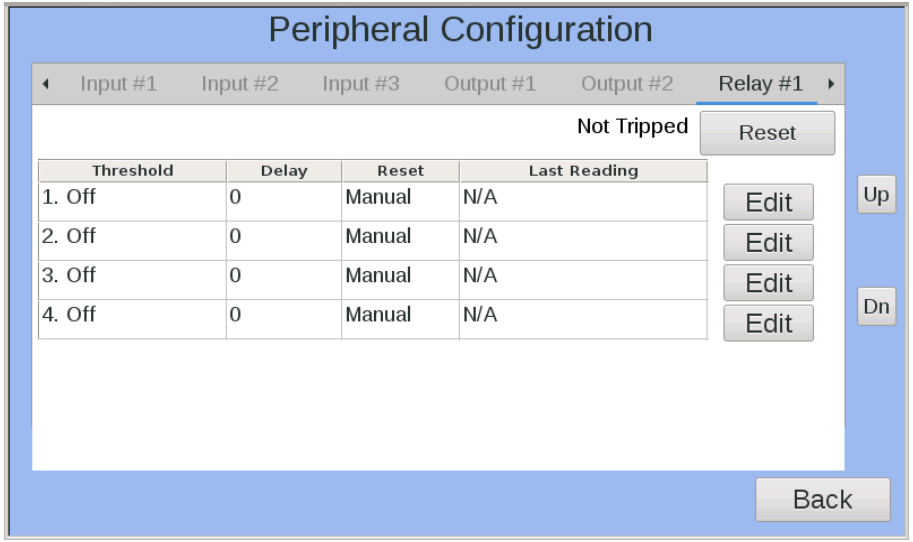
		Enter Threshold Limite for sensor	Delay value in second (0-10800) seg.
Parameter	Threshold Type	Last sensor value (actual value) Psi/F	0
Pi	<Less Than (manual reset)	200	30
Tm	>Greater Than (manual reset)	392	30

- To configure Intake Pressure (Pi) and Motor Temperature (Tm) as an trip parameter.

		Enter Threshold Limite for sensor	Delay value in second (0-10800) seg.
Parameter	Threshold Type	Last sensor value (actual value) Psi/F	0
Pi	<Less Than (auto reset)	250	30
Tm	>Greater Than (auto reset)	374	30

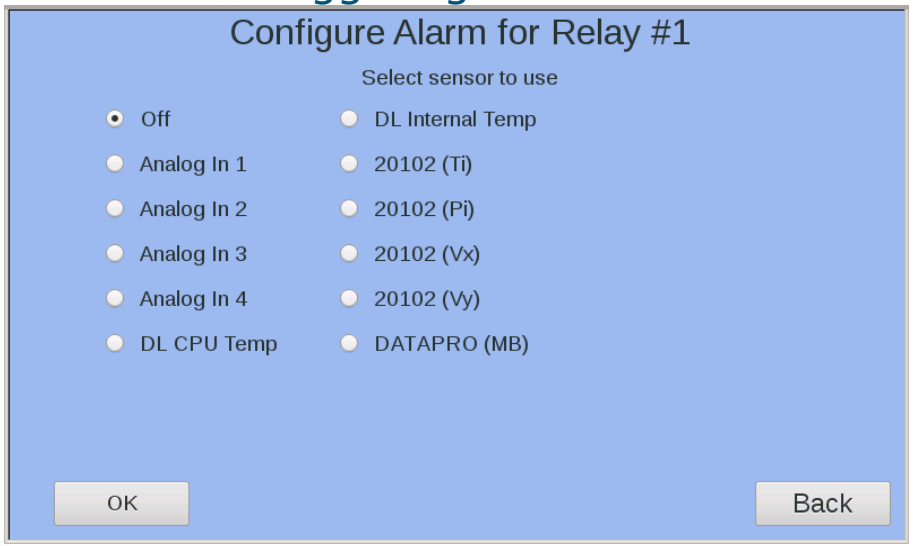
Relay #1 (Relay Configuration)

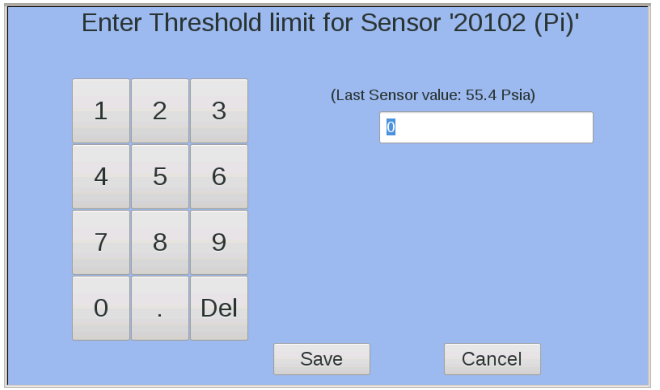
- Each relay can have maximum of ten separate threshold conditions and the relay is triggered if anyone out of ten set conditions become true
- After the relay trips, the main front screen shows the selected channel reading and tripped date and time in red. Follow the menu steps below to configure the Relays (example is for Relay #1 only):

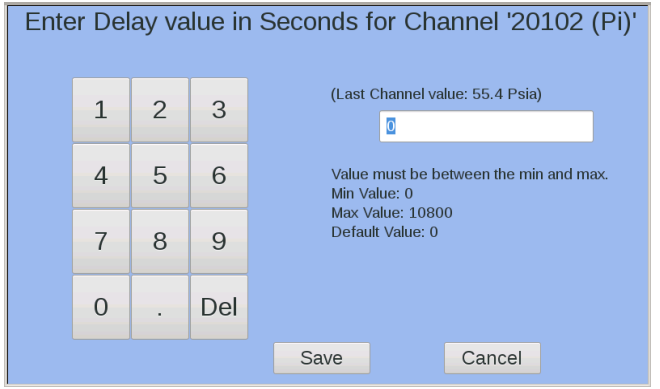


Relay #1 (Relay Configuration)

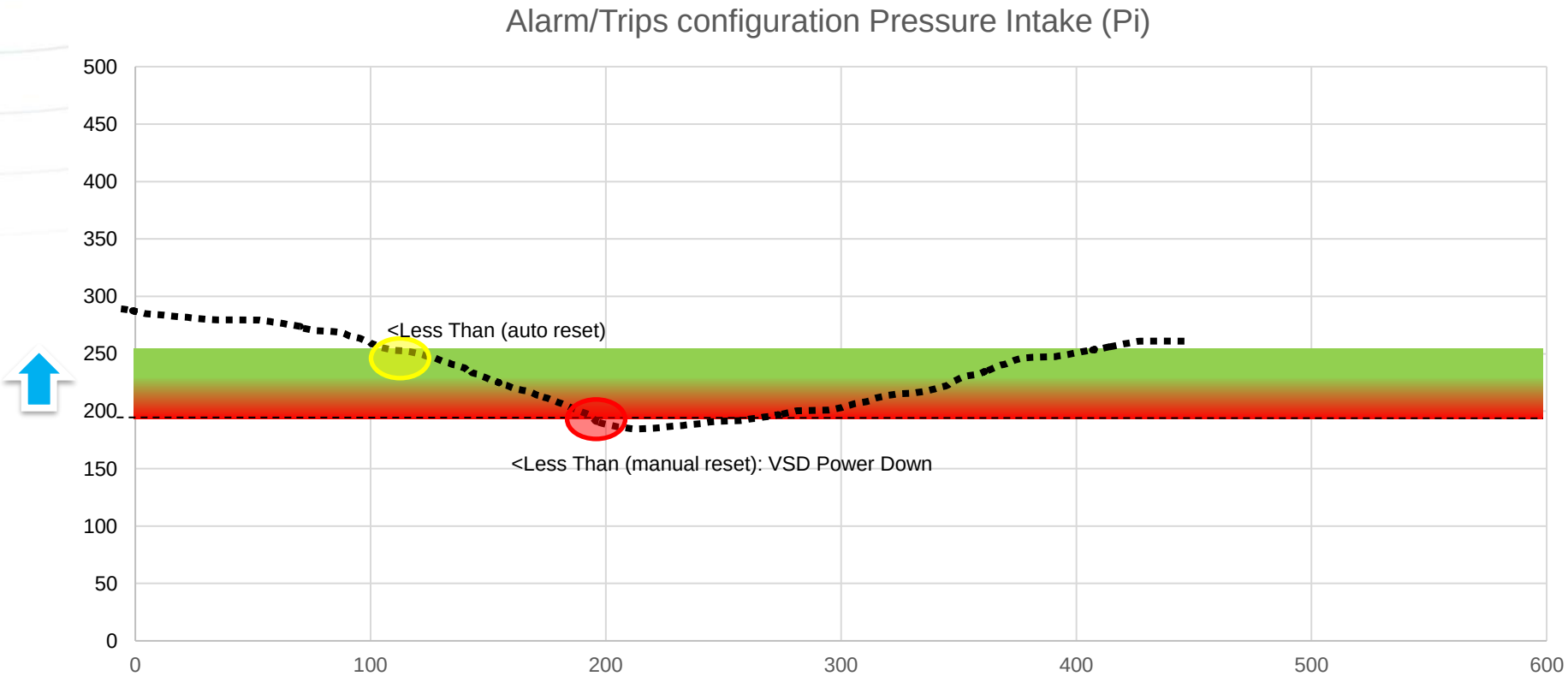
- The latched relays can be set to trigger on any peripheral or gauge parameter
- The user is encouraged to assign a ‘Delay’ to each threshold condition to avoid false triggering.



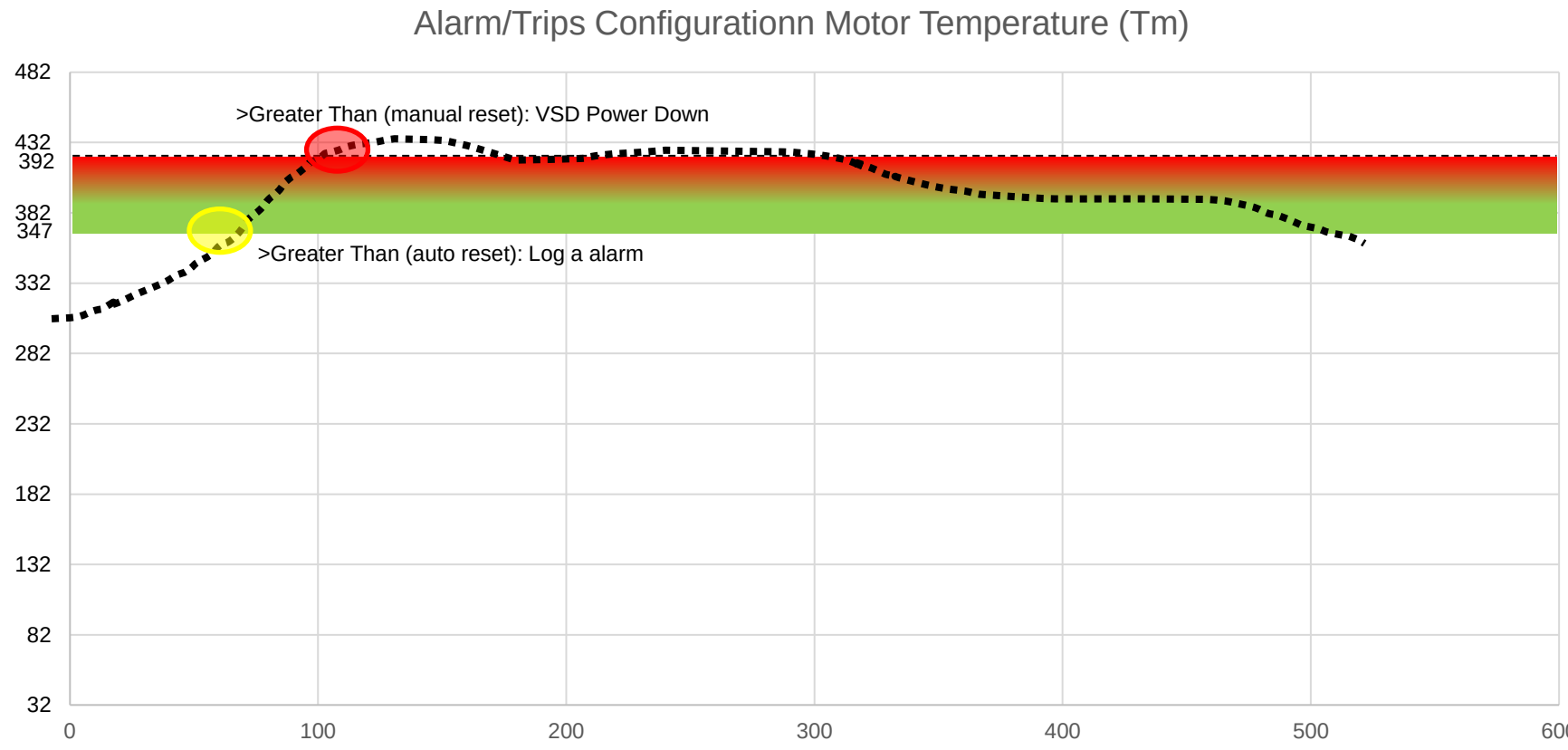




Data Pro



Data Pro

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