Getting Started With Your DMT-1000, 1040, 1042, or 1024

Programmable Multifunction Transducer

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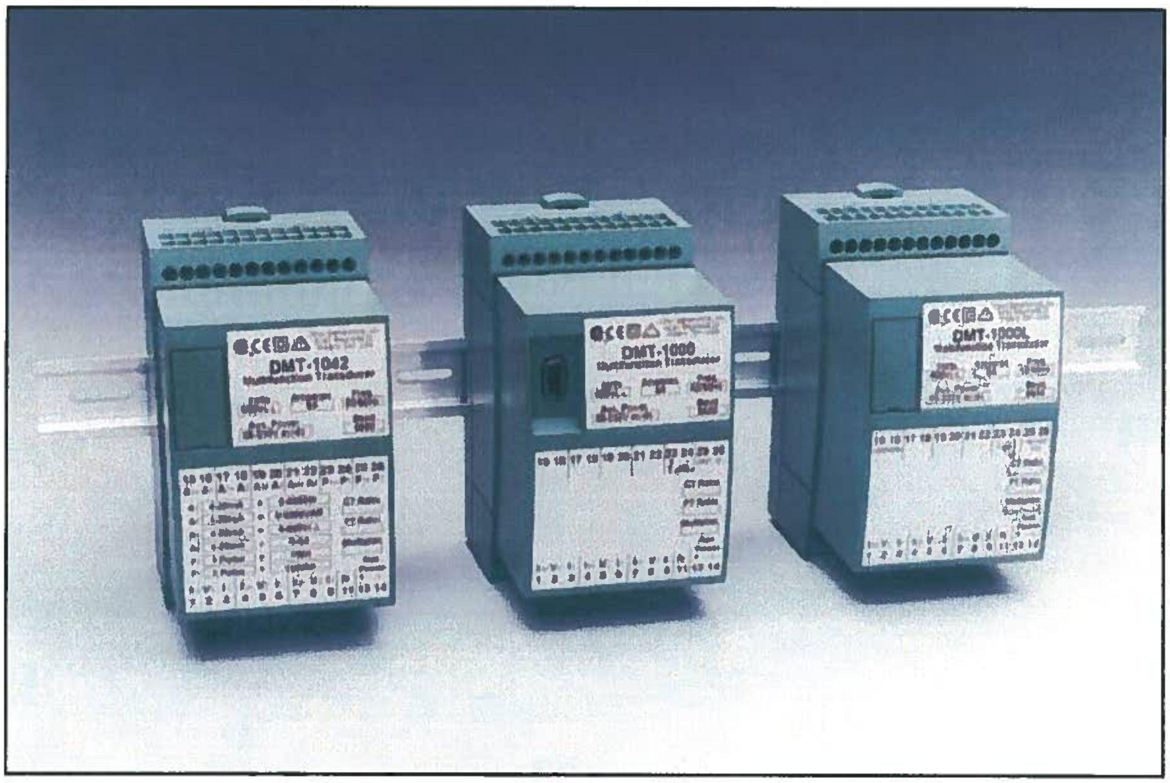

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Getting Started With Your DMT-1000, 1040, 1042, or 1024

Your DMT-xxxx must first be configured using the DMT-Config software which is available free of charge from Ohio Semitronics, Inc. The software is provided on a CD-ROM and includes a setup utility.

Equipment required:

1. DMT-Config software.
2. Computer running Microsoft Windows 9*, ME, or XP.
3. RS-232 COM port on computer.
4. Nine pin male to nine pin female cable (Straight not a null modem).
5. Power cord for the DMT-xxxx.

Software

If the DMT-Config software is not already installed on your computer, install it using the setup utility included on the CD-ROM.

Steps to Setup your DMT

1. Apply instrument power to terminals 13 and 14 on the DMT-xxxx. Instrument power may be between 85 and 230 volts AC or DC. It has a universal power supply.

2. Connect a nine pin to nine pin RS-232 cable between the DMT and an RS-232 COM port on your computer.

3. Start the DMT-Config software. The software will prompt you to click on the Model series of DMT that you are going to configure. Click on the version you have and then click OK.

4. Next check to ensure that the communication parameters are set properly. Click on Options, then Communications Interface, then Local RS-232, and finally the COM port that you are using on your computer. (See Fig. 1)

5. Check communication between the computer and the DMT by clicking on File, then Read From Transducer. The software should read the setup of the DMT and display that on the screen. (See Fig. 2)

   If communications are not working, make certain that you have the correct COM port selected for your computer (most computers have a COM 1 and a COM 2). Check to ensure that the DMT has instrument power applied to terminals 13 and 14 and check for proper polarity if using DC power.

   Once you have established communication, proceed to page 3.

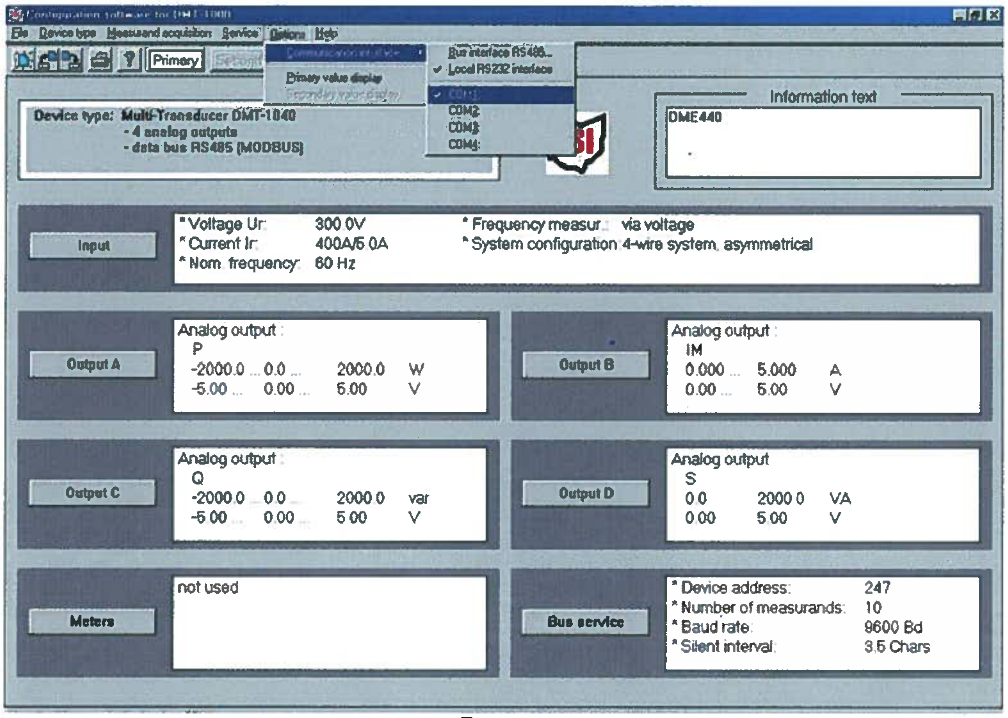

Figure 1

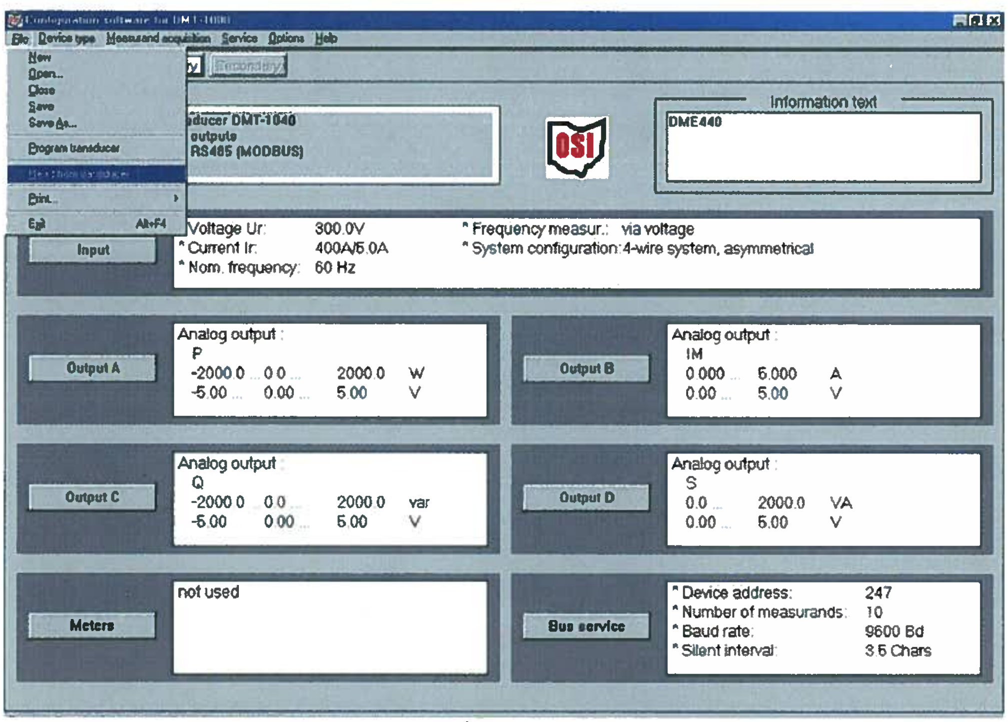

Figure 2

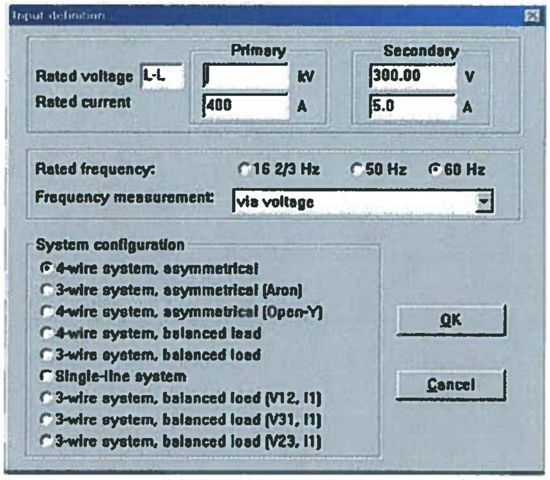

Figure 3

Set the input parameters by first clicking on the Input box. The software prompts for the input parameters. The pop up box shown at the left in Figure 3 is for the model DMT-1040X5. First define the type system that is going to be (System configuration). If you are using both potential and current transformers, define the primary and secondary for the transformers otherwise define only the secondary rated voltage. In Figure 3 on the left the input voltage is set of 300 volts line to line and the input current is set for using a 400:5 ratio current transformer. Be sure to set the frequency for 50 or 60 hertz. Once done click OK.

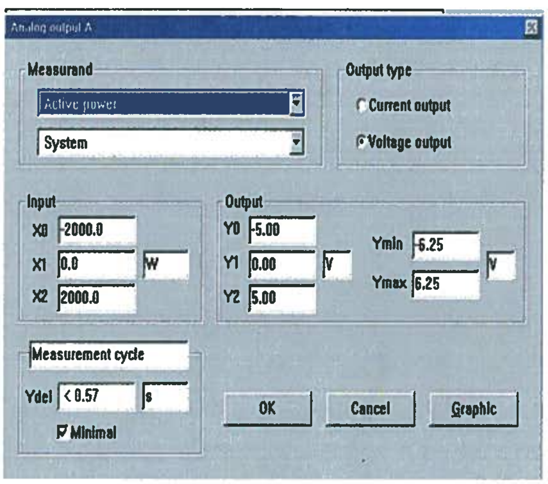

Figure 4

The DMT-1000 does not have analog outputs so skip this step for the DMT-1000.

If your DMT is a 1040, a 1042 or a 1024 you need to select the analog outputs – what to measure and whether per phase or system. The DMT-1040 and DMT-1042 both have four analog outputs and the DMT-1024 has two analog outputs. Set this for all the desired analog outputs. If you set the analog output as bi-directional, set the zero point or break point.

If you have a DMT-1042 or DMT-1024 set the pulse outputs also.

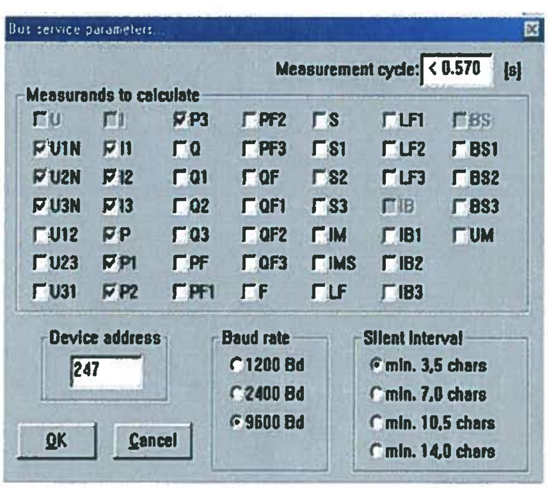

Figure 5

If your DMT has the MODBUS® interface set the bus parameters to be transmitted over the RS-485 line. The parameters that can be measured depend on the system configuration. See Figure 3 above and Chart 1 on page 4.

Check the parameters that you want to send via RS-485, set the Address, Baud rate, and Silent Interval (leave this on the default if you are not sure) then click OK. Refer to Figure 5 on the left for an example.

Chart 1 on page 4 shows all the parameters that may be measured for a given system configuration and a brief description of each parameter.

Register	Measurand	Single-phase system	4-wire balanced load	3-wire balanced load	3-wire un-balanced	4-wire un-balanced
100	1: U Voltage	✓	✓	✓	-	-
101	2: U1N Voltage L1 to Neutral	-	-	-	-	✓
102	3: U2N Voltage L2 to Neutral	-	-	-	-	✓
103	4: U3N Voltage L3 to Neutral	-	-	-	-	✓
104	5: U12 Voltage L1 to L2	-	-	-	✓	✓
105	6: U23 Voltage L2 to L3	-	-	-	✓	✓
106	7: U31 Voltage L3 to L1	-	-	-	✓	✓
107	8: I Current	✓	✓	✓	-	-
108	9: I1 Current Phase 1	-	-	-	✓	✓
109	10: I2 Current Phase 2	-	-	-	✓	✓
110	11: I3 Current Phase 3	-	-	-	✓	✓
111	12: P Power	✓	✓	✓	✓	✓
112	13: P1 Power Phase 1	-	-	-	-	✓
113	14: P2 Power Phase 2	-	-	-	-	✓
114	15: P3 Power Phase 3	-	-	-	-	✓
115	16: Q Reactive Power (VARs)	✓	✓	✓	✓	✓
116	17: Q1 Reactive Power Phase 1	-	-	-	-	✓
117	18: Q2 Reactive Power Phase 2	-	-	-	-	✓
118	19: Q3 Reactive power Phase 3	-	-	-	-	✓
119	20: PF Power Factor P/S	✓	✓	✓	✓	✓
120	21: PF1 Active Power Factor Phase 1 P1/S1	-	-	-	-	✓
121	22: PF2 Active Power Factor Phase 2 P2/S2	-	-	-	-	✓
122	23: PF3 Active Power Factor Phase 3 P3/S3	-	-	-	-	✓
123	24: QF Active Reactive Power Factor Q/S	✓	✓	✓	✓	✓
124	25: QF1 Reactive Power Factor Phase 1 Q1/S1	-	-	-	-	✓
125	26: QF2 Reactive Power Factor Phase 2 Q2/S2	-	-	-	-	✓
126	27: QF3 Reactive Power Factor Phase 3 Q3/S3	-	-	-	-	✓
127	28: F Frequency				✓	✓
128	29: S Apparent Power	✓	✓	✓	✓	✓
129	30: S1 Apparent Power Phase 1	-	-	-	-	✓
130	31: S2 Apparent Power Phase 2	-	-	-	-	✓
131	32: S3 Apparent Power Phase 3	-	-	-	-	✓
132	33: IM Average value of the currents	-	-	-	✓	✓
133	34: IMS Average value of the currents and sign of the active power	-	-	-	✓	✓
134	35: LF Power Factor of the System LF=(sign of Q)*(1-•PF•)	✓	✓	✓	✓	✓
135	36: LF1 Power Factor of Phase 1 LF1=(sign of Q1)*(1-•PF1•)	-	-	-	-	✓
136	37: LF2 Power Factor of Phase 2 LF2=(sign of Q2)*(1-•PF2•)	-	-	-	-	✓
137	38: LF3 Power Factor of Phase 3 LF3=(sign of Q3)*(1-•PF3•)	-	-	-	-	✓
138	39: IB 15 min RMS value of the current	✓	✓	✓	-	-
139	40: IB1 15 min RMS value of the current L1	-	-	-	✓	✓
140	41: IB2 15 min RMS value of the current L2	-	-	-	✓	✓
141	42: IB3 15 min RMS value of the current L3	-	-	-	✓	✓
142	43: BS 15 min Slave pointer function for the measurement of the RMS value IB	✓	✓	✓	-	-
143	44: BS1 15 min Slave pointer function for the measurement of the RMS value IB L1	-	-	-	✓	✓
144	45: BS2 15 min Slave pointer function for the measurement of the RMS value IB L2	-	-	-	✓	✓
145	46: BS3 15 min Slave pointer function for the measurement of the RMS value IB L3	-	-	-	✓	✓
146	47: UM Average of the voltages (U1+U2+U3)/3	-	-	-	-	✓

Chart 1
Parameters that may be measured via MODUS®

Last Step

Once you have set the input parameters, system configuration, analog output scaling, pulse outputs and/or MODBUS® settings, these must be saved into the DMT memory.

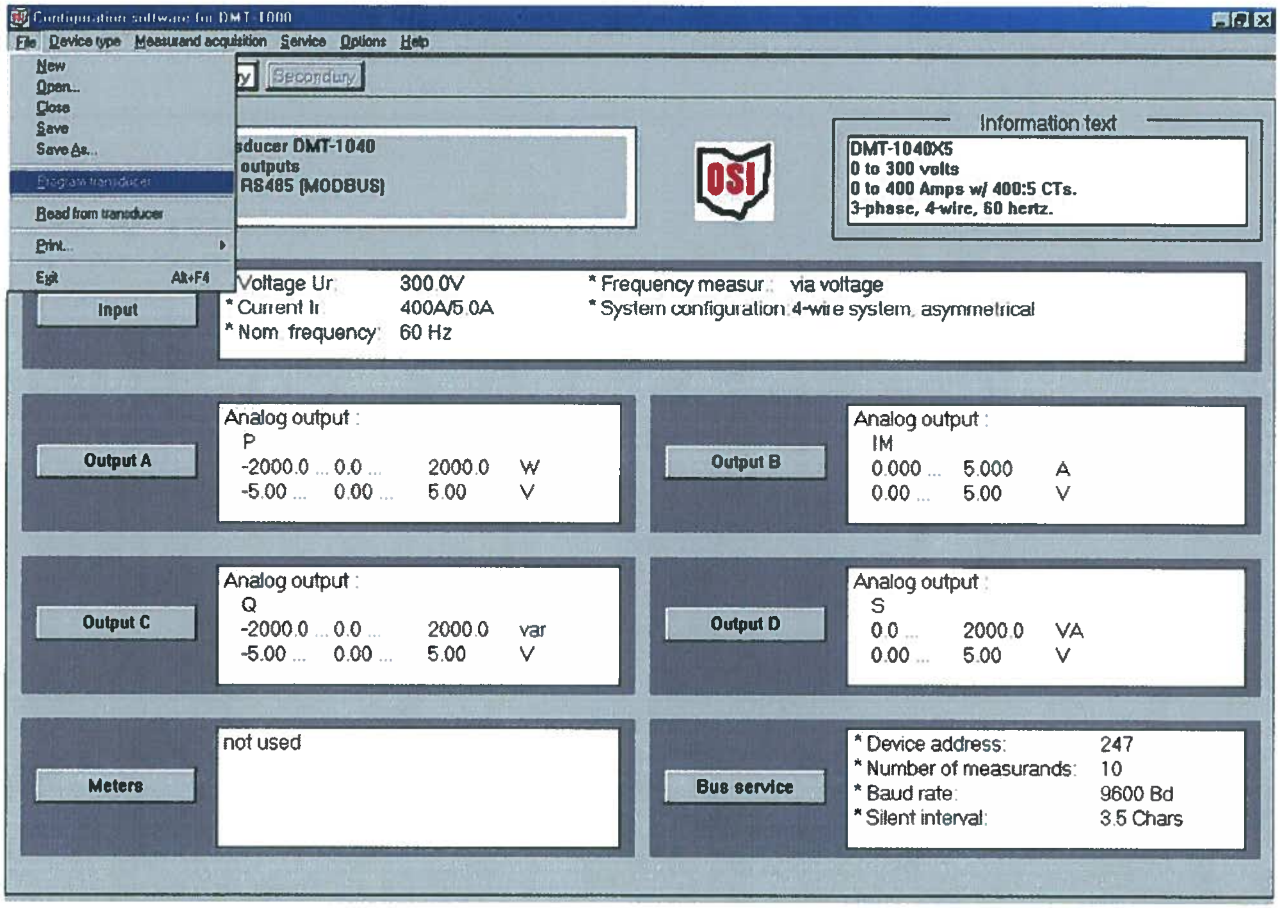

Figure 6

As shown in Figure 6 above, click on File, then click on Program Transducer. This will save the information into the DMT memory.

Programming of the DMT is now complete and it is ready to put into service.

If your DMT is a DMT-1000 or DMT-1040x and if there are multiple DMT transducers or other devices on the MODBUS® cable, make certain that each device has its' own unique address.

Getting the Data Using the MODBUS®.

Acquisition of the measured values via MODUS® is fully explained in the manual **MODBUS® Interface Definition for OSI Models DMT-1000 & DMT-1040**. If you do not have this manual, please request it from Ohio Semitronics, Inc.

The measured value (measurand) consists of two factors: the Raw_Value and the Scaling_Factor. The values for the Raw_Values are in registers 100 through 146. These are integer quantities.

The Scaling_Factors are in registers 300 through 393. These are 32-bit real numbers (double registers). To read these they must be defined as "swapped floating point" values in your PLC or computer. There are two ways to handle the Scaling_Factors:

1. Hard code the values into your PLC or computer program.
2. Read these values and store them in your PLC or computer.

In either case the Raw_Value must be multiplied by the Scaling_Factor.

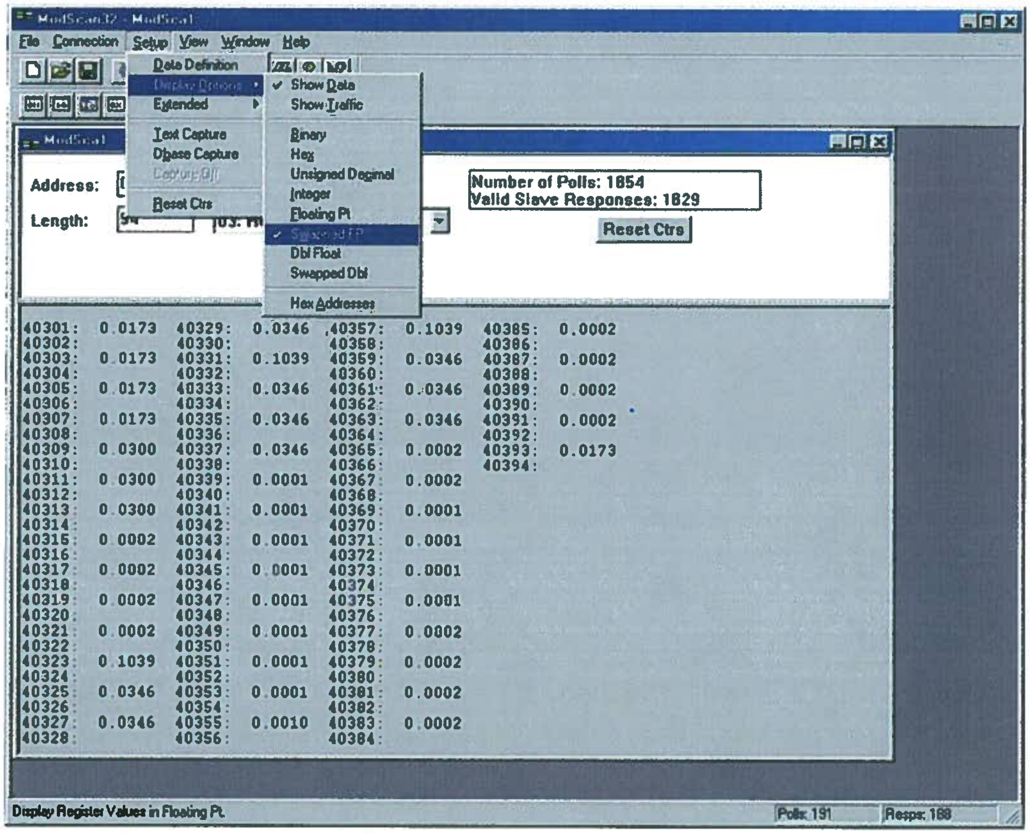

Figure 7

Figure 7 above shows the Scaling_Factors for our example being used. Note that these values are defined as "Swapped FP."

Since these are double precision or 32 bit numbers, each takes two registers. Refer to the MODBUS® Interface Definition manual for the parameter that each value represents.

NOTE: Subtract 1 from the register numbers shown in Figure 7 to obtain the corresponding register numbers given in the manual. The software that is being illustrated starts with 301 rather than 300.

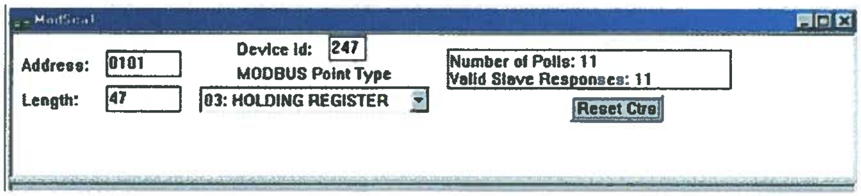

Figure 8

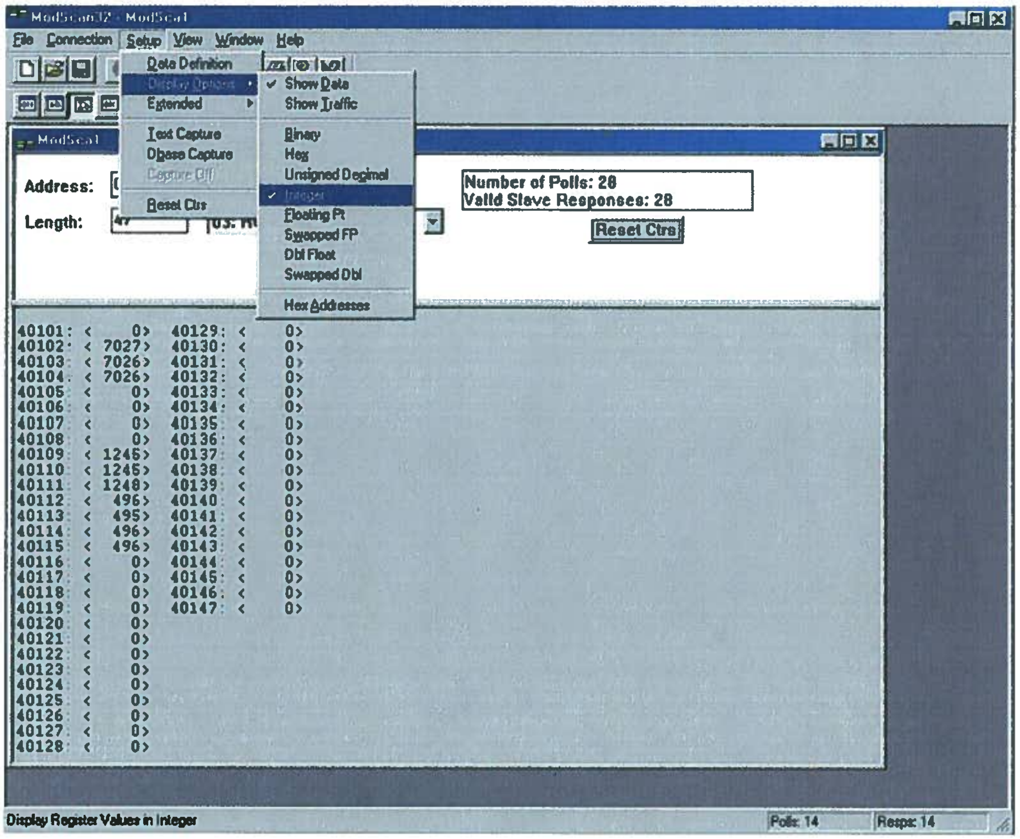

Figure 9

Figure 9 above shows the Raw_Values for the measurand. These integer values must be multiplied by the Scaling_Factors shown on the previous page either by hard coding the Scaling_Factors or by reading the Scaling_Factors and storing them in software.

Figure 8 above is the header for Figure 8 that is obscured by the pop-down menus.

NOTE: Subtract 1 from the register numbers shown in Figure 9 to obtain the corresponding register numbers given in the manual. The software that is being illustrated starts with 101 rather than 100.

Refer to the MODBUS® Interface Definition manual for more complete information.

MODBUS® - MODBUS is a registered trademark of Schneider Automation, Inc.

ModScan32 software was used to provide the data screens above. This program is available from WinTECH Software Design, P.O. Box 907, Lewisburg, WV 24901 USA, Telephone (304) 645-5966. More information is available at www.win-tech.com.