

# COMPLEX SOLUTIONS MADE SIMPLE.



## Gencomm Control Key Use with Modscan64/32

### 1 DESCRIPTION

This document describes how to send *System Control Keys* to DSE Modbus enabled controllers using Modscan64/32. These functions allow 'remote control' of the DSE module from Modscan64/32.

For a complete list of DSE controller MODBUS registers, refer to DSE document *Gencomm Standard for Use With Generating Set Control Equipment* (Gencomm). This is available from [support@deepseaelectronics.com](mailto:support@deepseaelectronics.com) upon request.

### 2 CONNECTIONS

 **NOTE:** For connection details, refer to the relevant controller's Operator Manual, available from [www.deepseaelectronics.com](http://www.deepseaelectronics.com).

Depending upon controller type differing connection options may be available. Refer to the relevant controller operator manual for further details.

Interface Type	MODBUS	Connections
Ethernet	TCP	Industry Standard CAT5, CAT5E, CAT6 etc cables.
RS485	RTU	Industry Standard 120 $\Omega$ impedance RS485 rated cable. DSE recommend and supply Belden 9841 cable for this purpose (DSE Part 016-130).
RS232	RTU	Industry Standard DE9 (9 pin 'D' connector) using NULL MODEM (crossover) cable.
USB	TCP	Requires DSE855 to convert to Ethernet.
	RTU	Requires DSE857 to convert to RS485.

### 3 SYSTEM CONTROL

 **NOTE:** *System Control Key* and *Complement of Control Key* **MUST** be written in the same MODBUS write operation using MODBUS Function Code 16 (Write Multiple Holding Registers).

 **NOTE:** Not all functions are supported by all modules. The Gencomm protocol includes a method for reading the list of supported functions from the connected controller. Refer to DSE document *Gencomm Standard for Use with Generating Set Control Equipment (Gencomm)* for further details. This is available from [support@deepseaelectronics.com](mailto:support@deepseaelectronics.com) upon request.

 **NOTE:** Numbers are decimal unless stated. Hexadecimal numbers are prefixed '0x'. E.g. the decimal value 16 is hexadecimal 0x10.

Control is performed by sending System Control Keys to the module, and also sending the bitwise opposite (or *one's compliment*) of the control key to another register 'in the same write operation'. This is for security to ensure that a Control Key is not sent 'by mistake'.

These registers are contained on Gencomm Page 16, offset 8 and offset 9.

Parameter	Gencomm Page	Offset	Address	
			Decimal	Hexadecimal
System Control Key	16 (0x10)	8 (0x08)	4104	0x1008
Compliment of Control Key	16 (0x10)	9 (0x09)	4105	0x1009

#### 3.1 SYSTEM CONTROL KEYS

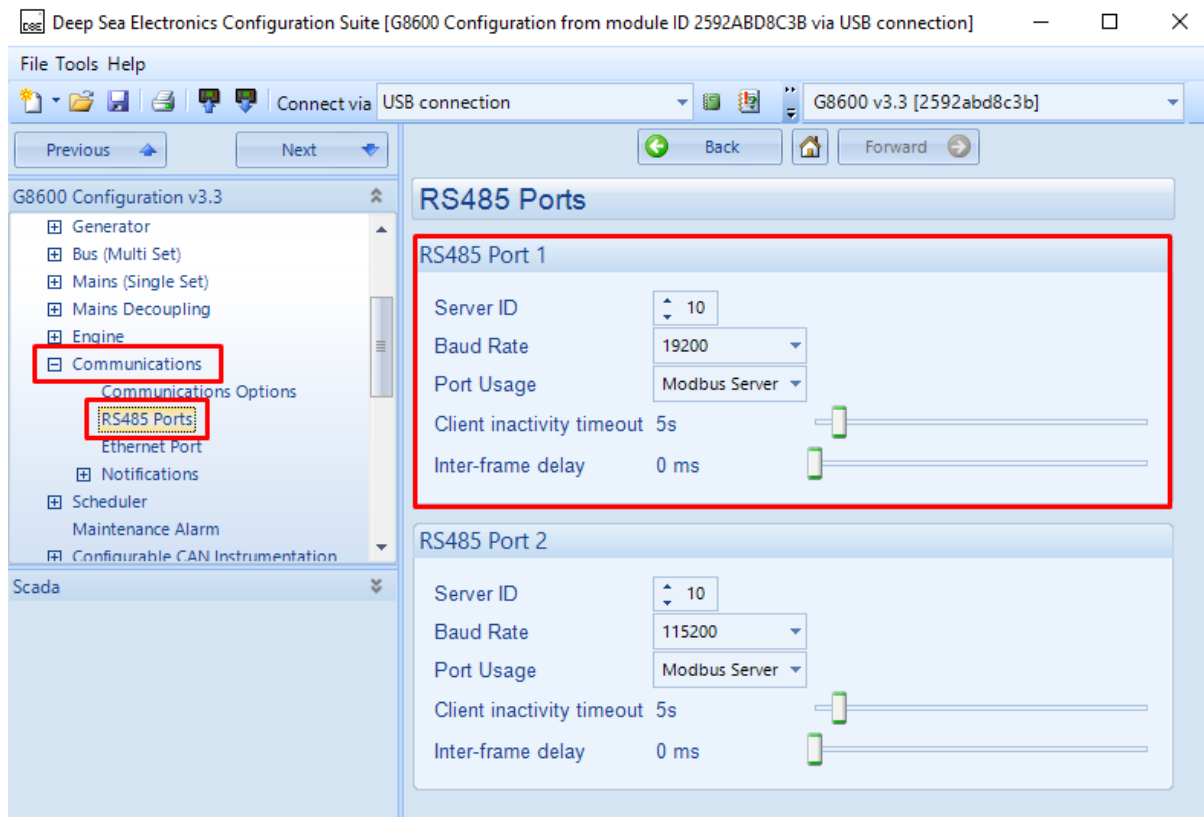
Function Code	System Control Function	System Control Key (decimal)	Compliment of Control Key (65535-Control Key)
0	Select Stop Mode	35700	29835
1	Select Auto Mode	35701	29834
2	Select Manual Mode	35702	29833
3	Select Test on Load Mode	35703	29832
4	Select Auto with Manual Restore Mode	35704	29831
5	Start Engine If in Manual or Test Modes	35705	29830
6	Mute Alarm	35706	29829
7	Reset Alarms	35707	29828
8	Transfer to Generator	35708	29827
9	Transfer to Mains	35709	29826
10	Reset Mains Failure	35710	29825
11	Close Bus (DSE8680 Bus Tie Controller)	35711	29824
12	Open Bus (DSE8680 Bus Tie Controller)	35712	29823
13	Toggle Bus Open/Closed (DSE8680 Bus Tie Controller)	35713	29822
14	Scroll Through Mode Selections (Mode Button on DSE3xx ATS)	35714	29821
15	Enable Selected Mode (Scroll Button on DSE3xx ATS)	35715	29820
16-31	RESERVED		
32	Telemetry Start If in Auto Mode	35732	29803
33	Cancel Telemetry Start in Auto Mode	35733	29802
34	Reset Alarms	35734	29801

Parameters Continued Overleaf.

Function Code	System Control Function	System Control Key (decimal)	Compliment of Control Key (65535-Control Key)
35	Clear Telemetry Alarm Flag	35735	29800
36	Lock the User Controls	35736	29799
37	Unlock the User Controls	35737	29798
38	Reset the Maintenance Alarm 1 Due Times	35738	29797
39	MSC Alarm Inhibit On	35739	29796
40	MSC Alarm Inhibit Off	35740	29795
41	Reset the Maintenance Alarm 2 Due Times	35741	29794
42	Reset the Maintenance Alarm 3 Due Times	35742	29793
43 to 45	Reserved	35743	29792
46	Start Data Logging (Temporarily Overrides the Module State)	35746	29789
47	Stop Data Logging (Temporarily Overrides the Module State)	35747	29788
48	Erase All Data Log Files Internal to The Module (NOT On USB)	35748	29787
49	Force USB drive to stop logging, ready to eject	35749	29786
50 to 65	RESERVED		
66	Reset battery maintenance alarm 1	35766	29769
67	Reset battery maintenance alarm 2	35767	29768
68	Reset battery maintenance alarm 3	35768	29767
69	Auto DPF regeneration inhibit on	35769	29766
70	Auto DPF regeneration inhibit off	35770	29765
71	Start manual DPF regeneration	35771	29764
72	Battery Charger Boost Mode	35772	29763
73	Battery Charger Stop Charging	35773	29762
74	Battery Charger Battery Test	35774	29761
75	Battery Charger Select Alternative Charging Voltage	35775	29760
76	Select Off Mode	35776	29759
77	Throttle Down	35777	29758
78	Throttle Up	35778	29757
79	Wake ECU	35779	29756
80	Lamp Test	35780	29755
81	Battery Charger Auxiliary Boost Mode	35781	29754
82	Battery Charger Auxiliary Stop Charging	35782	29753
83	Battery Charger Auxiliary Battery Test	35783	29752
84	Battery Charger Auxiliary Select Alternative Charging Voltage	35784	29751
85	Stop manual DPF regeneration	35785	29750
86	DSE Proprietary	35786	29749
87	Battery Charger Max Current Mode Timed	35787	29748
88	Battery Charger Max Current Mode Manual	35788	29747
89	AVR Droop Enable	35789	29746
90	AVR Droop Disable	35790	29745
91	Governor Droop Enable	35791	29744
92	Governor Droop Disable	35792	29743
93	Remote Mains Fail Enable	35793	29742
94	Remote Mains Fail Disable	35794	29741
95	Remote Mains Fail Toggle	35795	29740
96 to 65535	RESERVED		

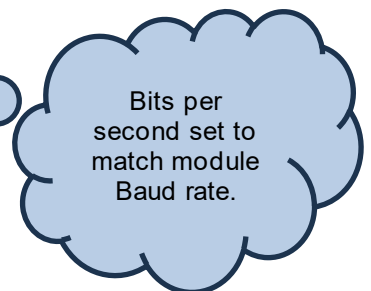
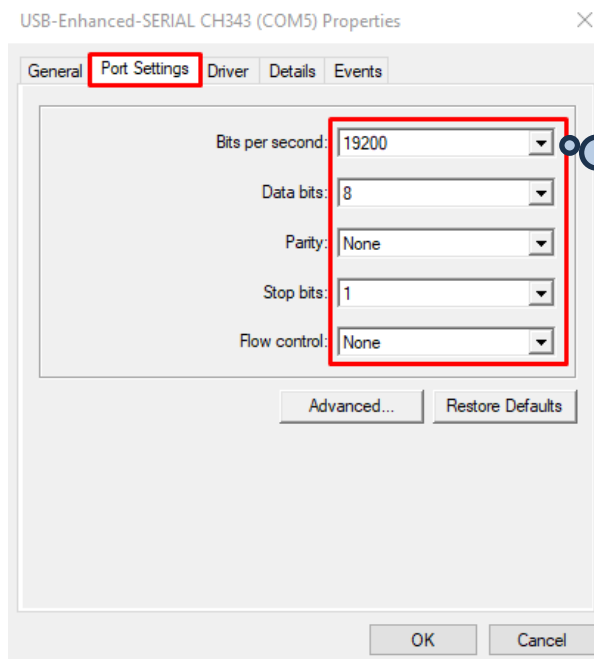
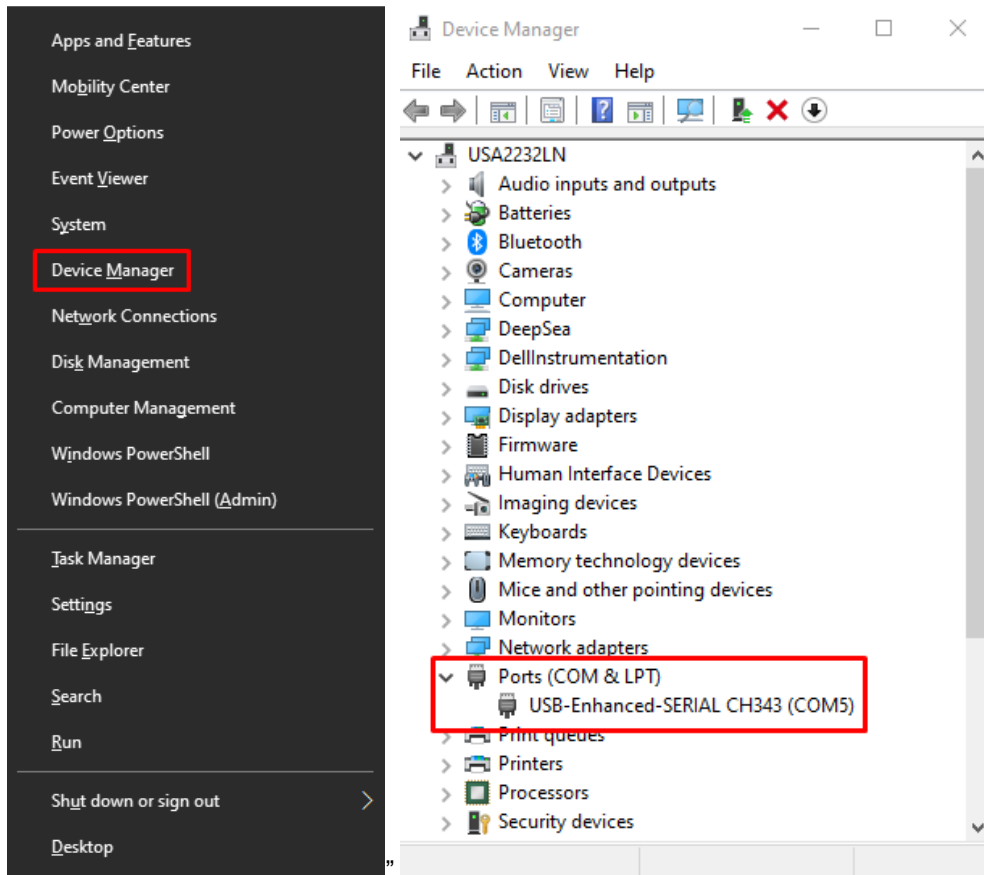
## 4 INSTRUCTIONS

### 4.1 MODULE COMMUNICATION SETTINGS

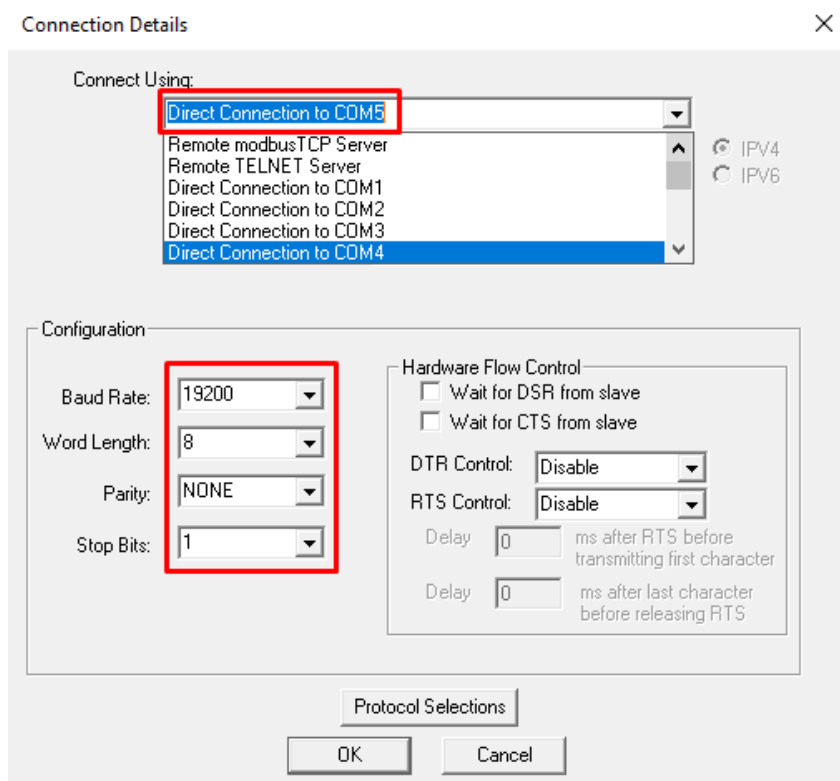
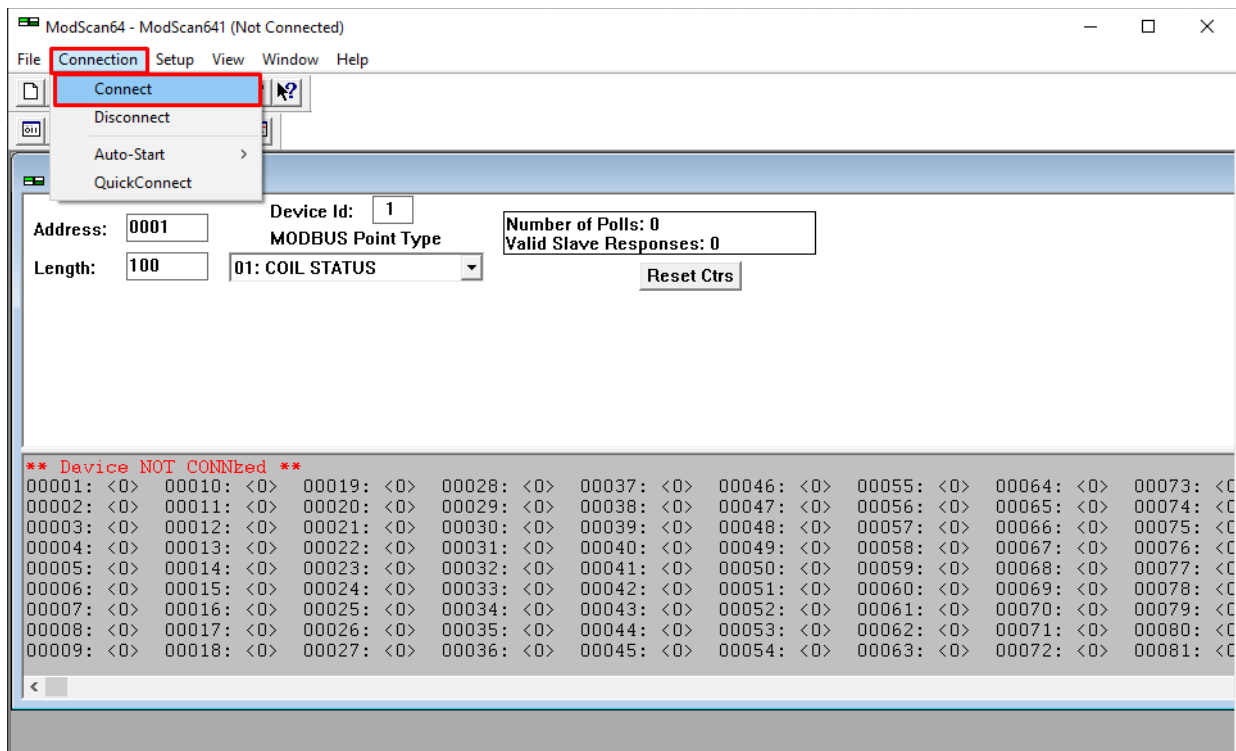


## 4.2 SERIAL ADAPTER COMMUNICATION SETTINGS

Windows Key + X to open menu, then select Device Manager.

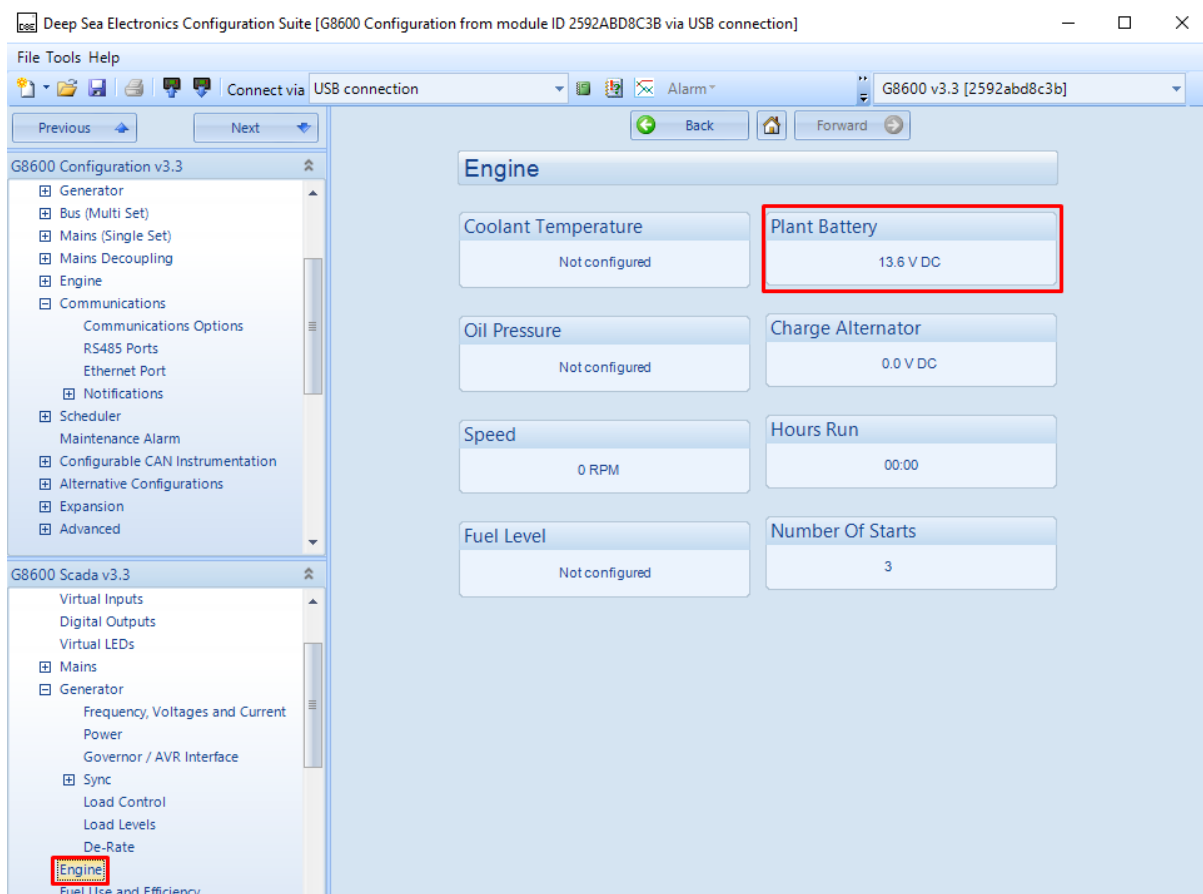
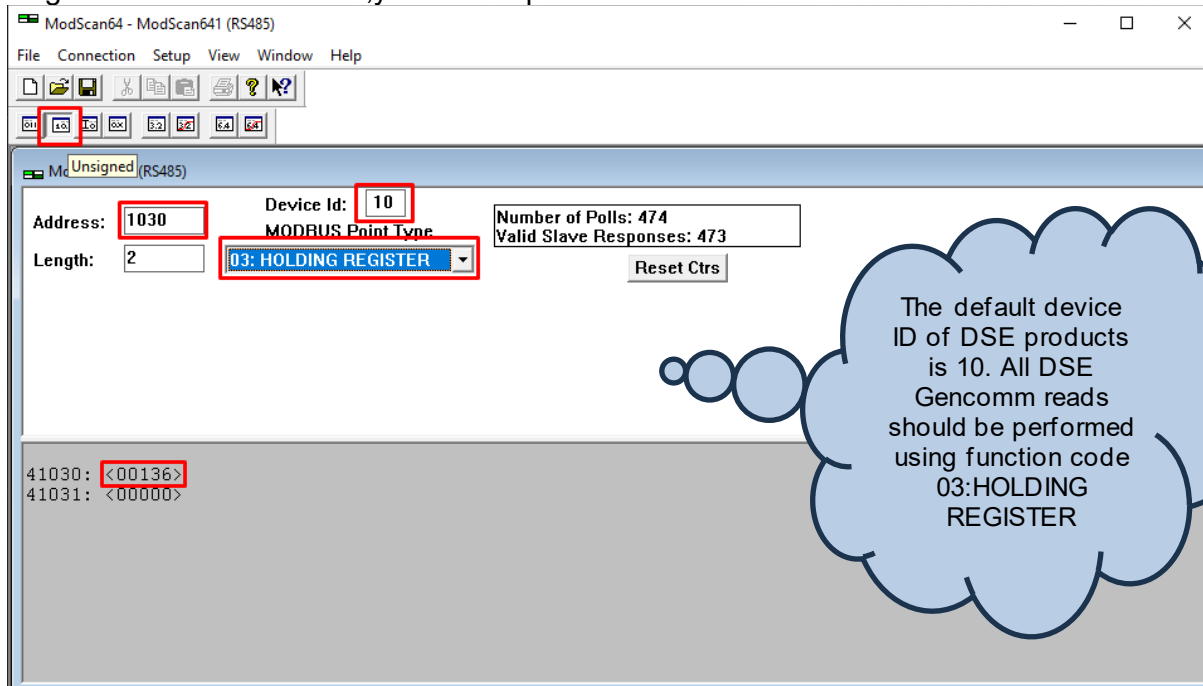


### 4.3 MODSCAN SERIAL COMMUNICATION SETTINGS



## 4.4 VERIFY CONNECTION

The connection can be verified by reading Engine (Plant) Battery Voltage found at Pg: 4 Register Offset: 5 ( $256 \times 4 + 5 = 1029$ ). Modscan requires adding 1 to the DSE Gencomm Register number as a result, you must input 1030 as the address.



## 4.5 SEND CONTROL KEY & COMPLIMENT



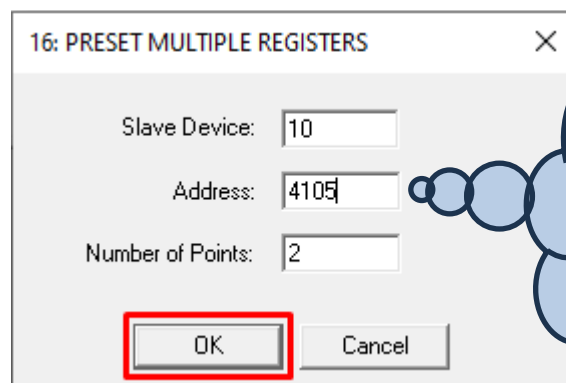
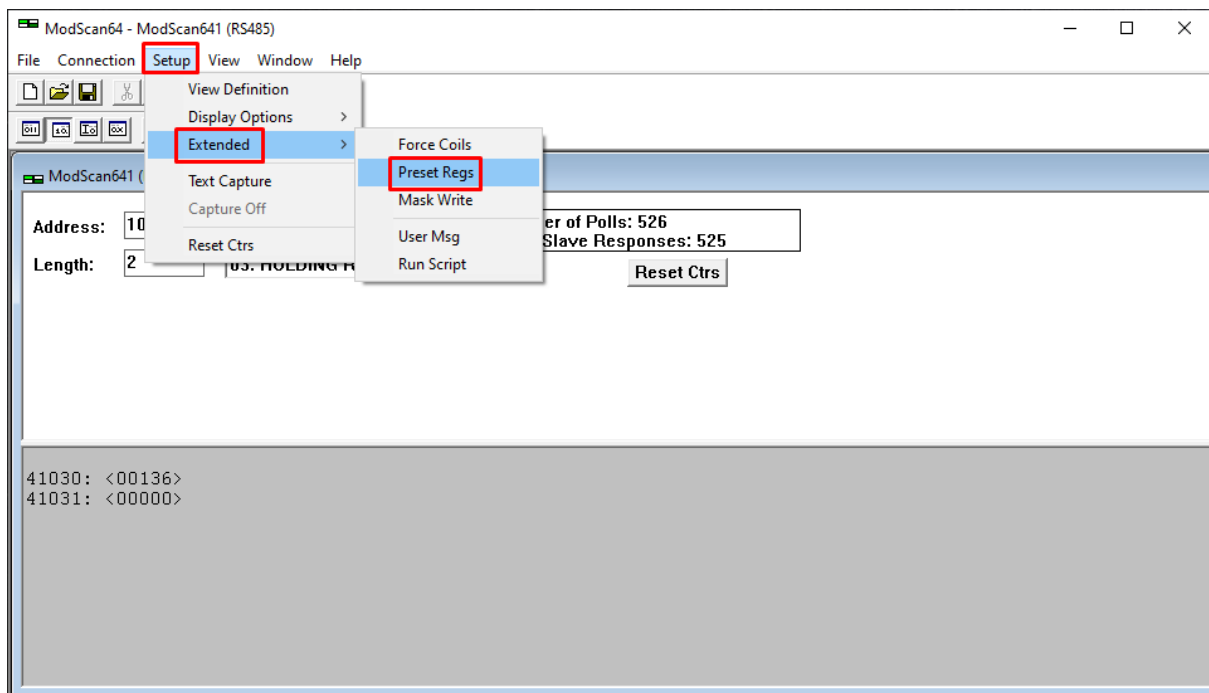
In this example, the module is currently in Stop mode. Modbus Control Keys will be used to switch to Auto mode.

The registers used for this are contained on Gencomm Page 16, offset 8 and offset 9.

Parameter	Gencomm Page	Offset	Address	
			Decimal	Hexadecimal
System Control Key	16 (0x10)	8 (0x08)	4104	0x1008
Compliment of Control Key	16 (0x10)	9 (0x09)	4105	0x1009

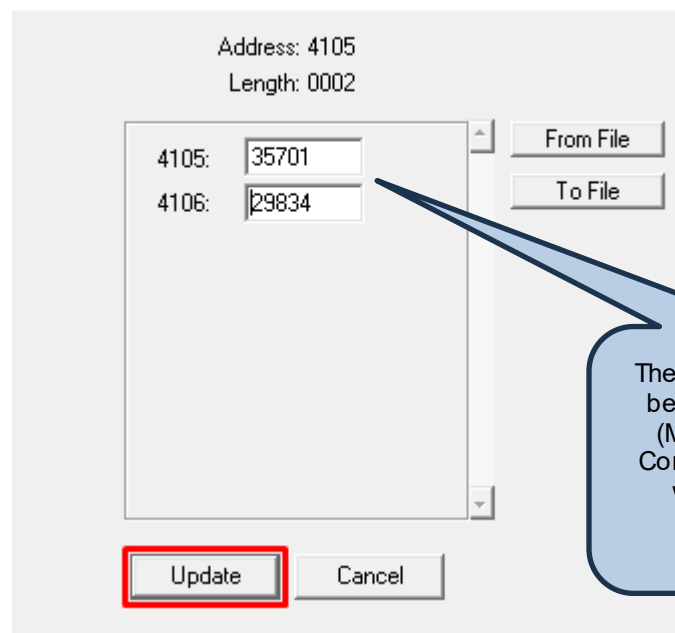
Function Code	System Control Function	System Control Key (decimal)	Compliment of Control Key (65535-Control Key)
0	Select Stop Mode	35700	29835
1	Select Auto Mode	35701	29834
2	Select Manual Mode	35702	29833
3	Select Test on Load Mode	35703	29832





Modscan requires adding 1 to any Gencomm register. As a result, 4104 will be input into Modscan as 4105.

16: PRESET MULTIPLE REGISTERS



The System Control key will be input into register 4104 (Modscan 4105) and the Compliment of Control Key will be input into 4105 (Modscan 4106).



The module is now in Auto mode.

## 5 INSTRUCTIONS FOR ETHERNET CONNECTION

### 5.1 MODULE COMMUNICATION SETTINGS

Configure the module and Windows PC to have fixed IP addresses. Duplicate settings as shown or change them as required for your system.

The screenshot shows the 'Deep Sea Electronics Configuration Suite [New G8600 Configuration]' window. The left sidebar lists various configuration categories, with 'Ethernet Port' highlighted under 'Communications'. The main panel displays the 'Ethernet Port' configuration settings.

**Ethernet Port**

IPv4 Link-Local Addresses

Obtain IPv4 Link-Local Address Automatically ☐

**Dynamic Host Configuration Protocol**

Obtain IP Address Automatically ☐

**Names**

Domain Name

Host Name

Vendor Name

**IP Addresses**

IP address	192	168	1	100
Subnet Mask	255	255	255	0
Gateway Address	0	0	0	0
DNS Address	0	0	0	0
Preferred Connection Address	0	0	0	0

**Modbus**

Modbus Port Number

## 5.2 WINDOWS NETWORK ADAPTER SETTINGS

Windows Key + X to open menu, then select Network Connection. Next, select Change adapter options by clicking.

The image shows a Windows Settings window on the right and a Start menu on the left. The Start menu is open, displaying various system utilities. 'Network Connections' is highlighted with a red rectangle. The Settings window shows the 'Network & Internet' section, with 'Status' selected in the left sidebar. The main area displays 'Network status' with a diagram showing a laptop connected to an Ethernet adapter (labeled 'Ethernet 2' and 'DeepSeaPLC.local') which is connected to the Internet. Below this, it states 'You're connected to the Internet' and provides a link to 'Change adapter options' (also highlighted with a red rectangle in the original image). Other options like 'Properties', 'Data usage', 'Show available networks', 'Network and Sharing Center', 'Network troubleshooter', 'View hardware and connection properties', 'Windows Firewall', and 'Network reset' are also visible.

Settings

Home

Find a setting

Network & Internet

- Status
- Wi-Fi
- Ethernet
- Dial-up
- VPN
- Airplane mode
- Mobile hotspot

Apps and Features

Mobility Center

Power Options

Event Viewer

System

Device Manager

**Network Connections**

Disk Management

Computer Management

Windows PowerShell

Windows PowerShell (Admin)

Task Manager

Settings

File Explorer

Search

Run

Shut down or sign out

### Status

#### Network status

Diagram: Laptop — Ethernet 2 (DeepSeaPLC.local) — Internet

You're connected to the Internet

If you have a limited data plan, you can make this network a metered connection or change other properties.

Connection	Data usage (last 30 days)	Properties	Data usage
Ethernet 2	141.47 GB	Properties	Data usage
Wi-Fi (DSE Corp)	143.49 GB	Properties	Data usage

Show available networks  
View the connection options around you.

### Advanced network settings

**Change adapter options**  
View network adapters and change connection settings.

Network and Sharing Center  
For the networks you connect to, decide what you want to share.

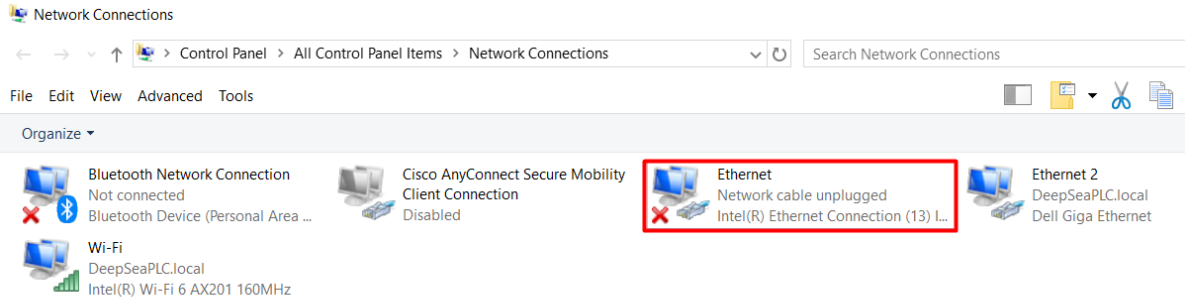
Network troubleshooter  
Diagnose and fix network problems.

[View hardware and connection properties](#)

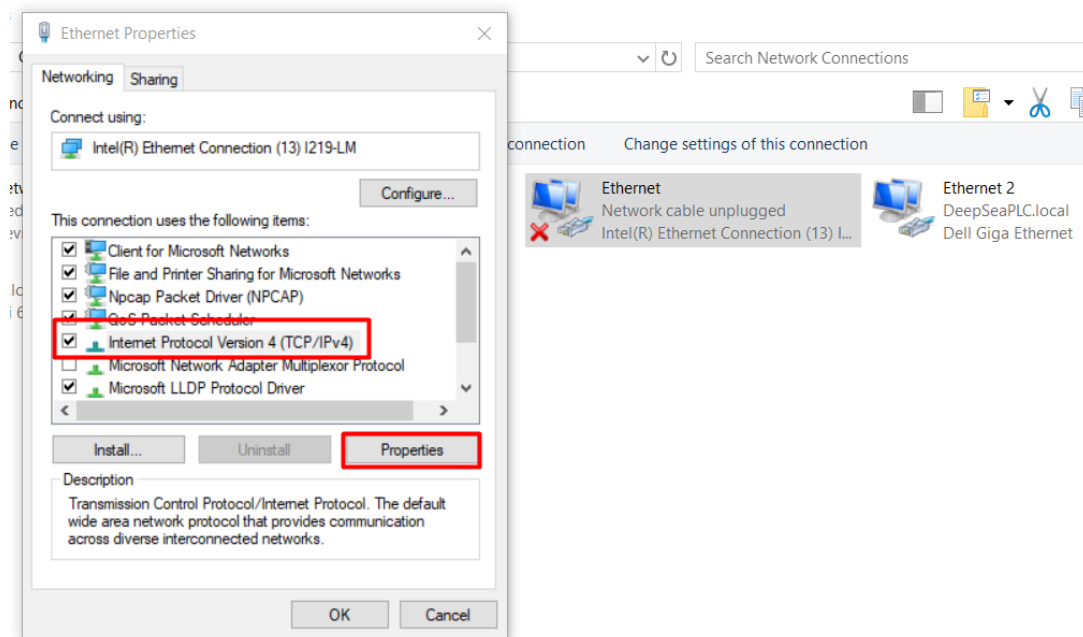
[Windows Firewall](#)

[Network reset](#)

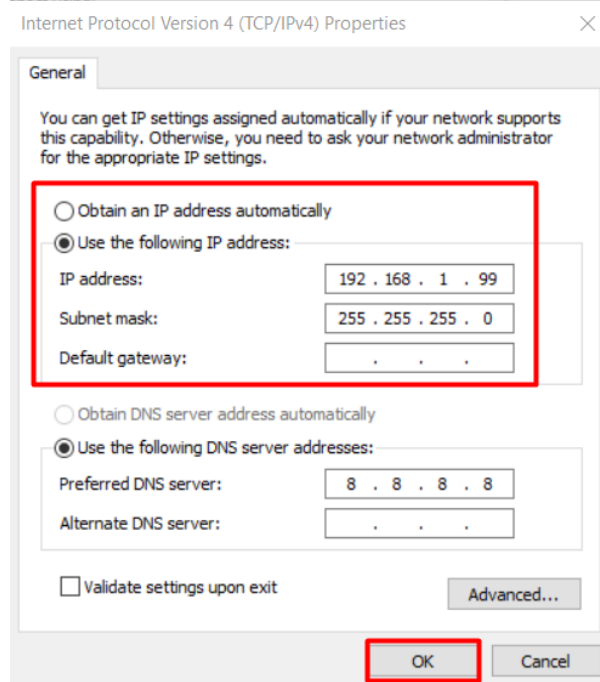
Choose the adapter that is to be used and select it by double clicking the icon



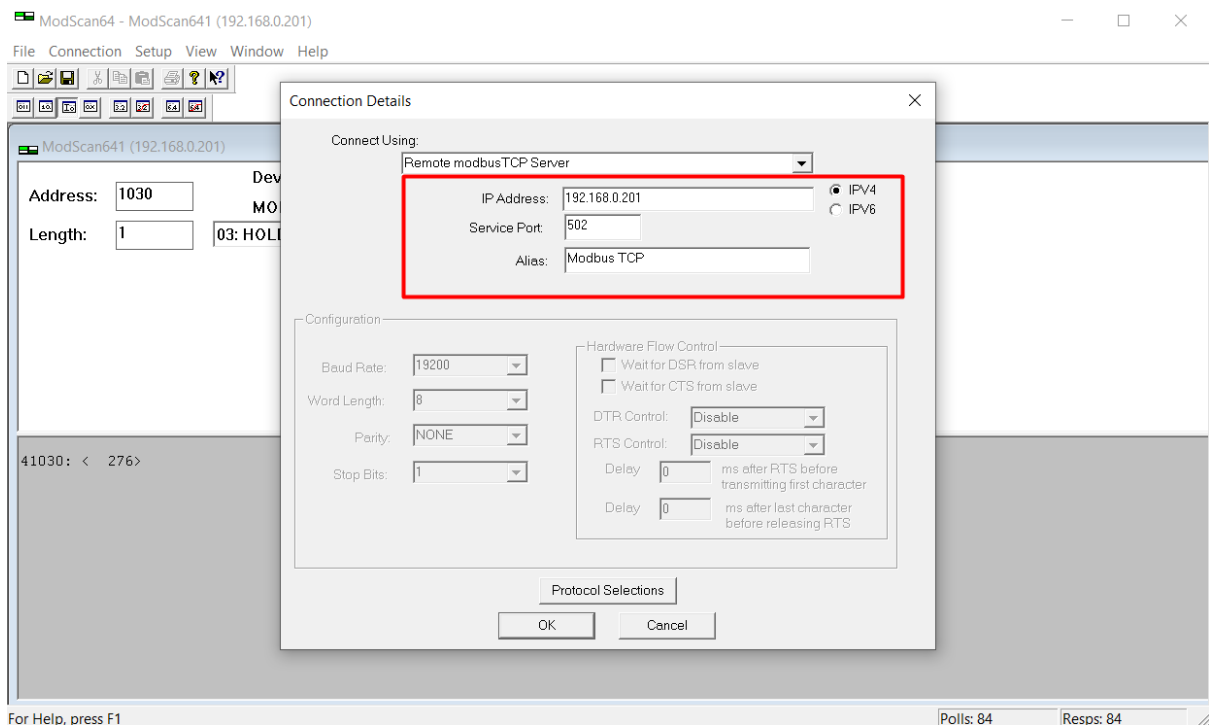
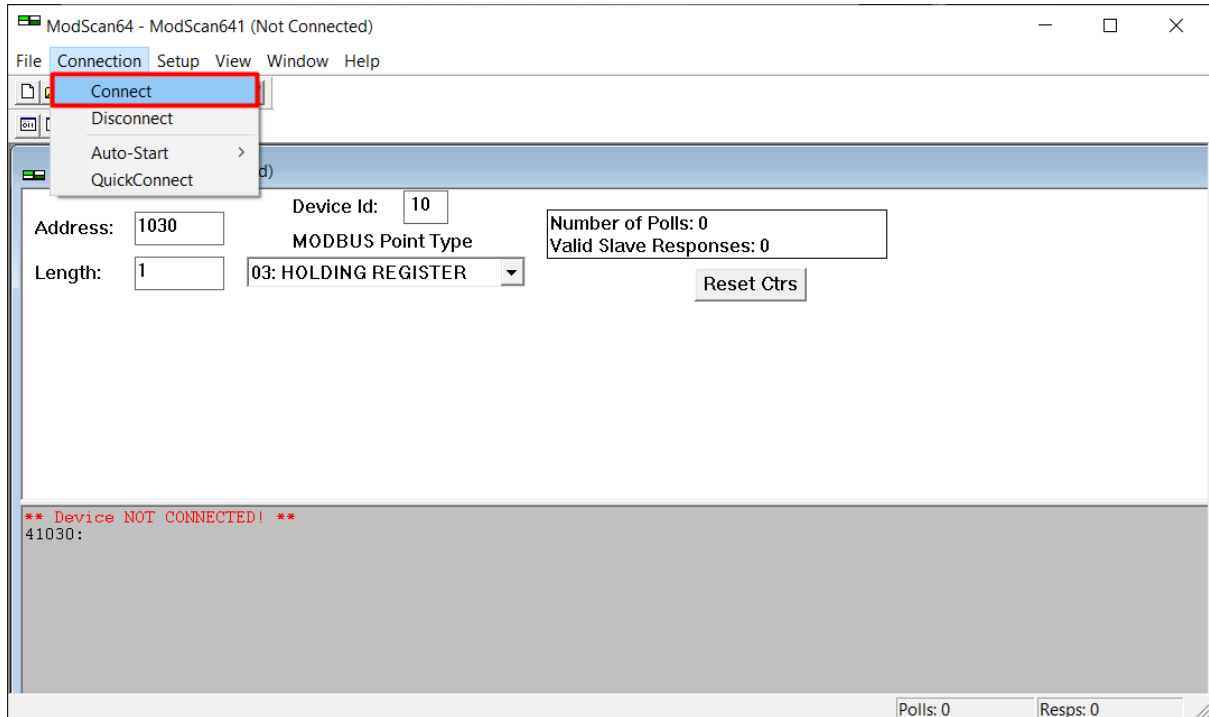
Select IPV4 and click properties



Set the IP address as shown below

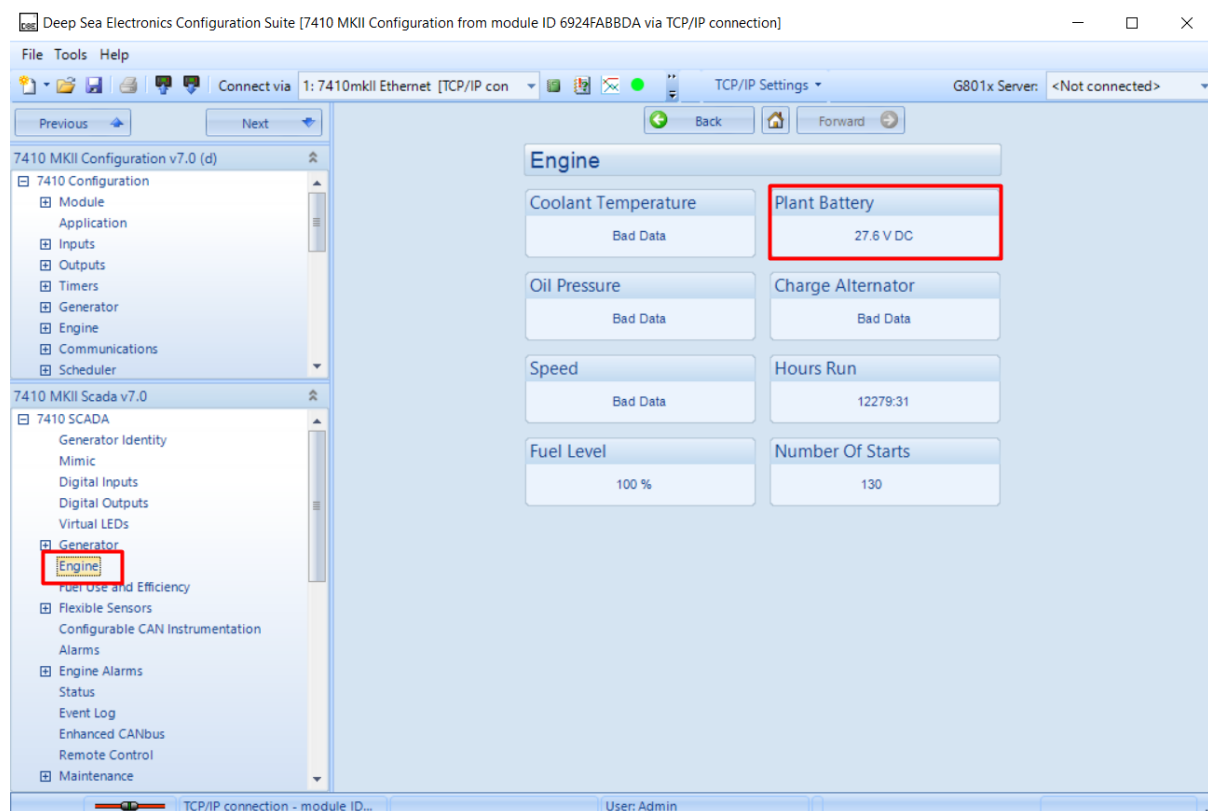
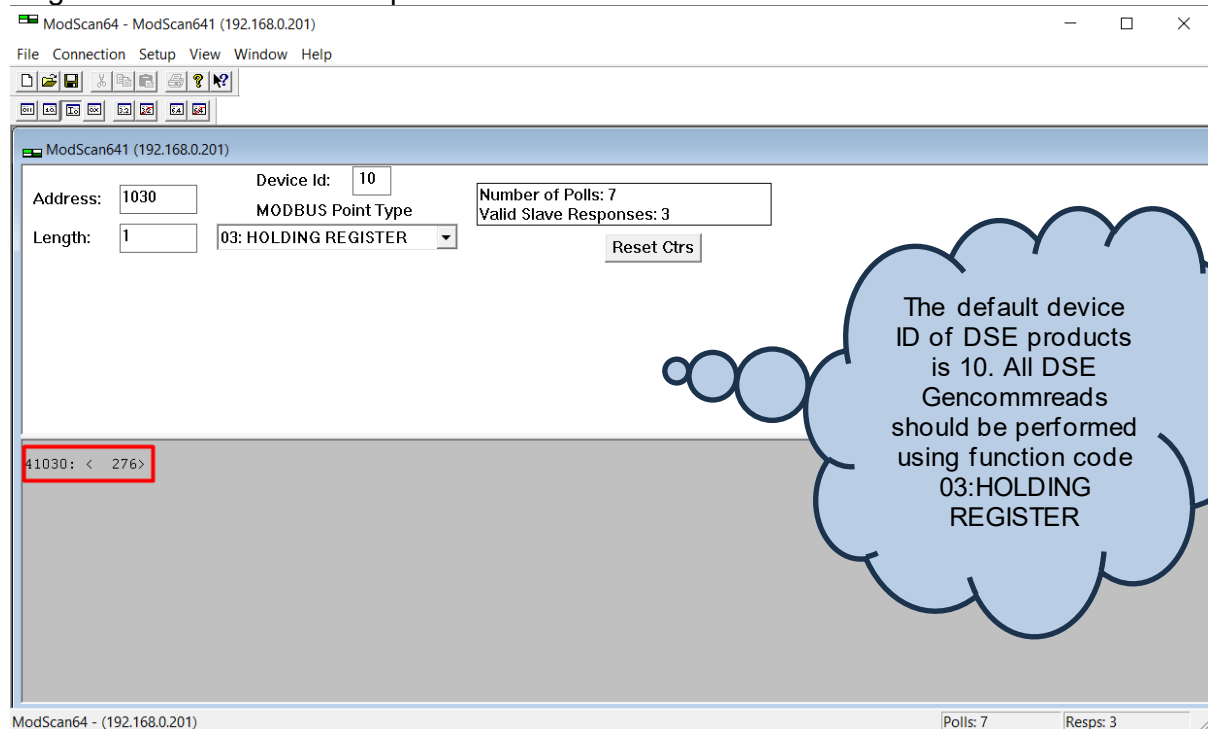


### 5.3 MODSCAN COMMUNICATION SETTINGS



## 5.4 VERIFY CONNECTION

The connection can be verified by reading Engine (Plant) Battery Voltage found at Pg: 4 Register Offset: 5 ( $256 \times 4 + 5 = 1029$ ). Modscan requires adding 1 to the DSE Gencomm Register number so we will input 1030 as the address.



## 5.5 SEND CONTROL KEY & COMPLIMENT



In this example, the module is currently in Stop mode. Modbus Control Keys will be used to switch to Auto mode.

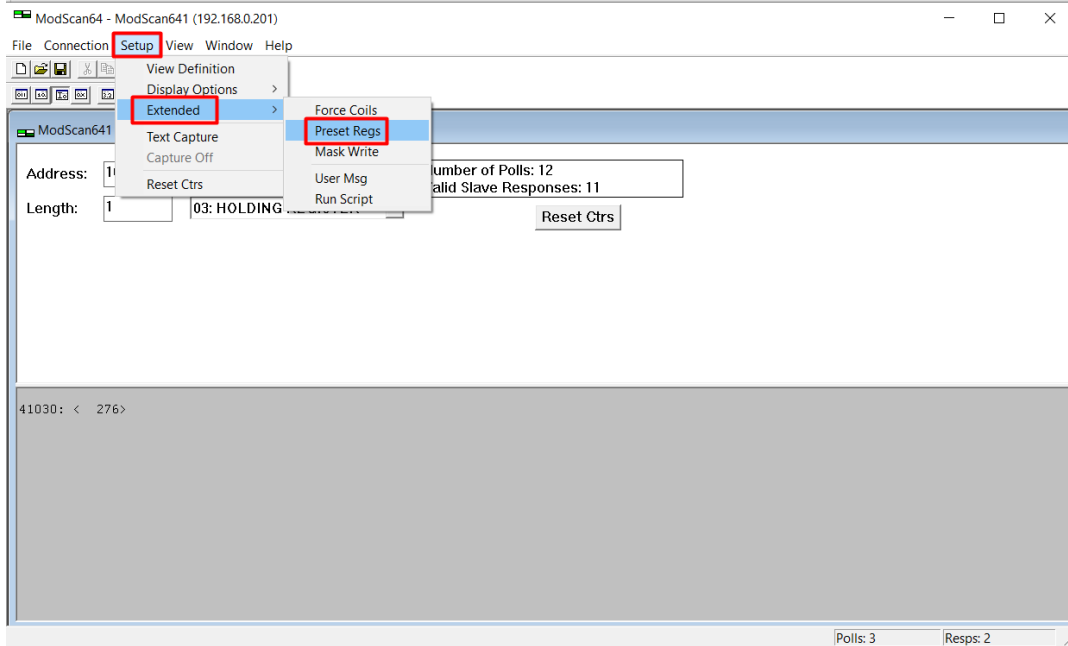
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3	Select Test on Load Mode	35703	29832



Select Setup>Extended>Preset Regs to input the control key and compliment simultaneously



16: PRESET MULTIPLE REGISTERS

Slave Device: 10

Address: 4105

Number of Points: 2

OK Cancel

Modscan requires adding 1 to any Gencomm register. As a result, 4104 will be input into Modscan as 4105.

16: PRESET MULTIPLE REGISTERS

Address: 4105  
Length: 0002

4105:	35701
4106:	29834

From File  
To File

Update Cancel

The System Control key will be input into register 4104 (Modscan 4105) and the Compliment of Control Key will be input into 4105 (Modscan 4106).



The module is now in Auto mode.