

# ModbusEZ V15

This plugin with a RS485 converter is used to control your spindle/motor and set RPM using UCCNC software controls and Gcode, it works with any VFD with modbus capabilities. Using this setup eliminates any need for additional wiring in electrical enclosure or special boards, communication is between the computer with UCCNC installed and directly connected to VFD with 2 wires RS+ and RS-.

With this direct connection gives you a faster response from VFD and more accurate and stable rpm setting. These RS485 converters are inexpensive and in most cases under \$10.00 US delivered.

RS485 converters come in several types, USB, Serial, and Ethernet.

## USB RS485



## Serial RS485



The USB is the most common but I personally use the Serial, I feel it's more immune to noise interference. There are many different suppliers for these USB converters so please do some research, I've read of many getting bad ones and going crazy with setup.

## ModbusEZ Features

1. ModbusEZ can be configured to control any spindle/motor.
2. Amp read is used for monitoring current draw from spindle/motor. Even though the label setup in configure is named "Amp Display" it can be used to read and display any holding register available in VFD manual.

### Important Setup notes for VFD Communications

There will be several settings in your VFD to configure to serial communications and vary between VFD's so you need to go through manual, there are 3 settings you will have options and need to be set correctly for ModbusEZ plugin are:

1. "Baud Rate" - plugin must match the same set baud rate in VFD settings.
2. "Data Format" - must be set to 8N1-RTU (8 bits, No polarity, 1 stop bit) in VFD settings.
3. "Communication Address" - needs to be set to 1 in VFD settings.

# ModbusEZ Setup

These instructions are for ModbusEZ and don't include instructions for setting up your VFD with spindle/motor and Modbus communication, please confirm this is already configured properly.

1. Extract zip file and place ModbusEZ.dll in UCCNC/Plugin folder.
2. Start UCCNC and goto CONFIGURATION / GENERAL SETTINGS / Configure plugins. Locate ModbusEZ and check "**Startup**" and "**Enable**". Restart UCCNC and go back and open ModbusEZ configure window.

## ModbusEZ Plugin "Serial Port Setup:"

1. Press "Available Ports" button and choose port from combobox your RS485 is connected to, and baudrate you setup in VFD.

## ModbusEZ Plugin" Spindle/Motor Setup:"

1. Set your min, max rpm and max HZ. The max RPM and HZ will be found on spindle/motor nameplate.
2. The default frequency resolution in ModbusEZ V15 is 0.1HZ since this is more commonly used, Check box if frequency resolution is 0.01HZ, this info can be found in VFD manual.

## ModbusEZ Plugin" Amp Display Setup:"

1. You will need to create a display field on your UCCNC screen to use this feature, One easy way is to simply copy and paste Sact field in UCCNC screen edit and place where you like. Replace label number with label number used in "Amp Display Setup" in screen edit.
2. You will need to input a Read register before checking box and enabling, this can be obtained in your VFD manual in the monitoring function section or similar. You actually can use any holding register you like and it will display returned values in created textfield box. I suggest not enabling this feature until your set up and controlling spindle.
3. Once setup you can change register and just hit save, you can read many different registers quickly/easily without restarting UCCNC.

## ModbusEZ Plugin" Modbus Setup:"

1. All register fields in plugins "Modbus Setup:" needs to be in hex(Hexadecimal). Most VFD manuals gives these value's in hex but a small few show them in decimal and in this case many converters can be found online with a quick Google search. See following page for additional help and examples.
2. You need to check 1 box on how to send commands to VFD, some VFD's can use more than 1 modbus function code and others will not, this info will be in your VFD manual. See following page for additional help and examples. Check to see if your VFD model is in list for complete configuration setups on last page.
3. If any changes are made in the "Modbus setup" UCCNC needs to be restated.

Picture below taken from NOWFOREVER VFD MANUAL E 100 for Example

## 9. 4. 1 Instruction Data

Instruction data as below list. only can be written by using function code 10H.

10H(16 dec) is Modbus function code for multiply registers

Convert Bits to hex for CCW

900 on/off address already in hex

Frequency address 901 hex

| MODBUS register address           | Countents   |  |
|-----------------------------------|---|--|
| 900H                              | Bit 0 1   | Run instruction: 1 run; 0 stop             |
|                                   | Bit 1 1   | Direction instruction: 1 reverse;0 forward |
|                                   | Bit 2 0   | JOG instruction: 1 JOG; 0 stop             |
|                                   | Bit 3 0   | Reset instruction: 1 fault reset; 0 no     |
|                                   | Bit 4~F   | reserved                                   |
| 901H                              | Frequency instruction                             |  |
| 902H                              | PID setting value                                 |  |
| 903H~908H                         | reserved  |  |
| 909H                              | Save instruction: 1 parameter data save to EEPROM |  |
| Remarks: Bit 0 for the lowest bit |   |  |

ON/OFF

CCW/CW

**Note: Bits are written from right to left. Example below is for CCW using online converter.**

### Binary to Hexadecimal Converter

In order to use this **binary to hex converter** tool, type a binary value like 1110 into the left field below, and hit the Convert button. This way, you can convert up to 63 binary characters to hex.

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|  |                   |
|--|-------------------|
| Binary value                           | Hexadecimal value |
| 0011                                   | 3                 |
| <input type="button" value="Convert"/> |                   |

MODBUSEZ V15 SETUP For UCCNC

|  |  |
|--|--|
| <b>Serial Port Setup:</b>                            | <b>Modbus Setup:</b>   |
| Available Ports                                      | ON/OFF Address/Coil 0900   |
| Com Ports COM1                                       | Frequency Address/Coil 0901  |
| Baud Rates 9600                                      | Spindle On CW 0001   |
| Stop Bits One  | Spindle On CCW 0003  |
|  | Spindle Off 0000   |
| <b>Spindle/Motor Setup:</b>                          | <input type="checkbox"/> Single Holding Registers                    |
| Min RPM 5000   | <input type="checkbox"/> Check box for Single Coil                   |
| Max RPM 24000  | <input type="checkbox"/> Check box for Multiple Coils                |
| Max HZ 400   | <input checked="" type="checkbox"/> Check box for Multiple Registers |
| <input type="checkbox"/> Frequency Resolution 0.01HZ | <input type="checkbox"/> RPM ONLY!!!                                 |
| <b>Amp Display Setup:</b>                            |  |
| <input checked="" type="checkbox"/> Enable           |  |
| Label Number 232323                                  |  |
| Register 0503  |  |
| Divide By 10   |  |
| <input type="button" value="Save all Settings"/>     |  |

Pressing this button will show you your systems available com ports.

Typical China Spindle 24000 rpm / 400HZ

Check this box for 0.01 frequency resolution

see manual pic above

Save settings and restart UCCNC

After restart and when return to ModbusEZ configure window you will see data was converted to HI and Low bytes.

The screenshot shows the MODBUSEZ V15 SETUP For UCCNC window. It is divided into four main sections: Serial Port Setup, Modbus Setup, Spindle/Motor Setup, and Amp Display Setup.

- Serial Port Setup:** Available Ports (button), Com Ports (COM1), Baud Rates (9600), Stop Bits (One).
- Modbus Setup:**
  - ON/OFF Address/Coil: 0900
  - Frequency Address/Coil: 0901
  - Spindle On CW: 0001
  - Spindle On CCW: 0003
  - Spindle Off: 0000
  - Single Holding Registers: ☐ (modbus function code 0x06)
  - Check box for Single Coil: ☐ (modbus function code 0x05)
  - Check box for Multiple Coils: ☐ (modbus function code 0x0F)
  - Check box for Multiple Registers: ☒ (modbus function code 0x10)
  - RPM ONLY!!!: ☐ (Using this feature all you will need is a frequency address and will be sent as a Single Holding Register)
- Spindle/Motor Setup:**
  - Min RPM: 5000
  - Max RPM: 24000 (motor nameplate)
  - Max HZ: 400 (motor nameplate)
  - Frequency Resolution 0.01HZ: ☐
- Amp Display Setup:**
  - Enable read holding register: ☒ (Enable read holding register)
  - Label Number: 232323 (Textfield number on UCCNC screen)
  - Register: 0503 (Register to read)
  - Divide By: 10 (Divideby is used for Holding register response, in most cases 10 is needed. If frequency resolution 0.01 is check than 100. I suggest using 1 on initial setup to help determine format needed.)

**ModbusEZ Plugin "Amp Enabled"**

Below is an example locating your amp output address(Output current) in VFD manual.

**Taken from NOWFOREVER VFD MANUAL E 100 for Example**

|        |                   | Parameter     | Unit   | Address |
|--------|-------------------|---------------|--------|---------|
| d2-001 | Setting frequency | 0.00~600.00Hz | 0.01Hz | 501H    |
| d2-002 | Output frequency  | 0.00~600.00Hz | 0.01Hz | 502H    |
| d2-003 | Output current    | 0.1~2000.0A   | 0.1A   | 503H    |
| d2-004 | Output voltage    | 0.1~2000.0V   | 0.1V   | 504H    |
| d2-005 | DC bus voltage    | 100~1000V     | 1V     | 505H    |

Confirm Output current (points to d2-003)

503 address already in hex (points to 503H)

The follow page provides a list of complete modbus setup with make and model names for modbusEZ . In most cases the make of the VFD will have same settings for all of there models. I only found this NOT to be true with Hitachi and Huanyang GT.

Below is a list of popular Make and model VFD's with correct settings for ModbusEZ. If your make is listed most likely settings will work regardless of model, so far I only seen this not true with Hitachi. Settings shown in "Spindle/Motor Setup:" is for a common China spindle 24000 rpm and 400HZ.

### Bosh Rexroth EFC 5610

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 700  
Frequency Address/Coil: 701  
Spindle On CW: 0081  
Spindle On CCW: 0083  
Spindle Off: 0088

**Spindle/Motor Setup:**  
Min RPM: 3000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: 0000 DivideBy:

☐ Single Holding Registers  
☐ Check box for Single Coil  
☒ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### NowForever E 100

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 0900  
Frequency Address/Coil: 0901  
Spindle On CW: 0001  
Spindle On CCW: 0003  
Spindle Off: 0000

**Spindle/Motor Setup:**  
Min RPM: 5000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☒ Enable  
Labelnumber: 232323 Register: 0503 DivideBy: 10

☐ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☒ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### Hitachi X200

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 0000  
Frequency Address/Coil: 0001  
Spindle On CW: 0003  
Spindle On CCW: 0001  
Spindle Off: 0000

**Spindle/Motor Setup:**  
Min RPM: 3000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: DivideBy:

☐ Single Holding Registers  
☐ Check box for Single Coil  
☒ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### Hitachi WJ200

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 1000  
Frequency Address/Coil: 0001  
Spindle On CW: 0001  
Spindle On CCW: 0003  
Spindle Off: 0000

**Spindle/Motor Setup:**  
Min RPM: 3000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☒ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: DivideBy:

☐ Single Holding Registers  
☐ Check box for Single Coil  
☒ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### Machtric S800E

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 2000  
Frequency Address/Coil: 2001  
Spindle On CW: 000A  
Spindle On CCW: 0006  
Spindle Off: 0001

**Spindle/Motor Setup:**  
Min RPM: 5000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### KCLY KOC100

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 2000  
Frequency Address/Coil: 2000  
Spindle On CW: 0001  
Spindle On CCW: 0002  
Spindle Off: 0006

**Spindle/Motor Setup:**  
Min RPM: 4000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### Delta VFD-M

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 2000  
Frequency Address/Coil: 2001  
Spindle On CW: 000A  
Spindle On CCW: 0006  
Spindle Off: 0001

**Spindle/Motor Setup:**  
Min RPM: 5000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### SUNFAR E300

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 1001  
Frequency Address/Coil: 1002  
Spindle On CW: 0001  
Spindle On CCW: 0002  
Spindle Off: 0003

**Spindle/Motor Setup:**  
Min RPM: 3000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings

### Huanyang GT Series

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**  
Available Ports: COM1  
Com Ports: COM1  
BaudRates: 9600  
StopBits: One

**Modbus Setup:**  
ON/OFF Address/Coil: 1000  
Frequency Address/Coil: 2000  
Spindle On CW: 0001  
Spindle On CCW: 0002  
Spindle Off: 0005

**Spindle/Motor Setup:**  
Min RPM: 4000  
Max RPM: 24000  
Max HZ: 400  
motor nameplate motor nameplate

☒ Frequency Resolution 0.01HZ

**Amp Display Setup:**  
☐ Enable  
Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!!

Save all Settings



## SAVCH S900

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**

Available Ports:  Com Ports: COM1 BaudRates: 9600 StopBits: One

**Modbus Setup:**

ON/OFF Address/Coil: 2000  
Frequency Address/Coil: 2001  
Spindle On CW: 0012  
Spindle On CCW: 0022  
Spindle Off: 0001

**Spindle/Motor Setup:**

Min RPM: 5000 Max RPM: 24000 Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**

☐ Enable Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!

## Ecogoo 9100

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**

Available Ports:  Com Ports: COM1 BaudRates: 9600 StopBits: One

**Modbus Setup:**

ON/OFF Address/Coil: 1000  
Frequency Address/Coil: 2000  
Spindle On CW: 0001  
Spindle On CCW: 0002  
Spindle Off: 0005

**Spindle/Motor Setup:**

Min RPM: 3000 Max RPM: 24000 Max HZ: 400  
motor nameplate motor nameplate

☒ Frequency Resolution 0.01HZ

**Amp Display Setup:**

☐ Enable Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!

## AB Power Flex 4

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**

Available Ports:  Com Ports: COM1 BaudRates: 9600 StopBits: One

**Modbus Setup:**

ON/OFF Address/Coil: 2000  
Frequency Address/Coil: 2001  
Spindle On CW: 0012  
Spindle On CCW: 0022  
Spindle Off: 0001

**Spindle/Motor Setup:**

Min RPM: 5000 Max RPM: 24000 Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**

☐ Enable Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!

## YASKAWA V1000

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**

Available Ports:  Com Ports: COM1 BaudRates: 9600 StopBits: One

**Modbus Setup:**

ON/OFF Address/Coil: 0001  
Frequency Address/Coil: 0002  
Spindle On CW: 0001  
Spindle On CCW: 0003  
Spindle Off: 0000

**Spindle/Motor Setup:**

Min RPM: 5000 Max RPM: 24000 Max HZ: 400  
motor nameplate motor nameplate

☒ Frequency Resolution 0.01HZ

**Amp Display Setup:**

☐ Enable Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!

## Powtran PI9000

MODBUSEZ V15 SETUP For UCCNC

**Serial Port Setup:**

Available Ports:  Com Ports: COM1 BaudRates: 9600 StopBits: One

**Modbus Setup:**

ON/OFF Address/Coil: 2000  
Frequency Address/Coil: 0001  
Spindle On CW: 0001  
Spindle On CCW: 0002  
Spindle Off: 0006

**Spindle/Motor Setup:**

Min RPM: 5000 Max RPM: 24000 Max HZ: 400  
motor nameplate motor nameplate

☐ Frequency Resolution 0.01HZ

**Amp Display Setup:**

☐ Enable Labelnumber: Register: DivideBy:

☒ Single Holding Registers  
☐ Check box for Single Coil  
☐ Check box for Multiple Coils  
☐ Check box for Multiple Registers  
☐ RPM ONLY!!!