

# APPLICATION NOTE

## OJ DV Modbus protokol



67468E 09/23 (M.JL) © 2023 OJ Electronics A/S

**OJ Drives®**

A DRIVES PROGRAMME DEDICATED TO VENTILATION SOLUTIONS

  
OJ ELECTRONICS

## Generelt

Denne protokol indeholder tilgængelige Modbusadresser og -registre i OJ DV.

Modbus kan få adgang til enkelt-adresser eller flere adresser samtidigt, enten læsning eller skrive en enkelt bit-værdi eller 16-bit-værdier. En Modbus adresse indeholder enten en 1-bit værdi eller en 16-bit heltal.

## Modbus forbindelse

OJ DV er forsynet med 4 stk. tilslutninger for Modbus kommunikation.

Tre RJ12-stik samt 1 sæt fjerderpåvirkede tilslutningsklemmer.

I klemrækken med fjerderpåvirkede tilslutningsklemmer til styresignaler (A/D I/O) er der tre klemmer for tilslutning af RS-485 markeret med "A" & "B" og "GND". Se fig.1.

Disse RS-485 klemmer og RS-485-pins i RJ12-stik "A" og "B" er internt parallelt forbundne. RJ12 stik "C" er udelukkende for tilslutning af eksternt følerudstyr.

De 3 RJ12 stikforbindelser er markeret med "A", "B" & "C":

- "A": RS-485 interface tilslutning, slave, +24VDC spændingsforsyning i stik, for tilslutning af eks. håndterminal (OJ-DV-HTERM)
- "B": RS-485 interfacetilslutning, slave, ingen spændingsforsyning i stik, for tilslutning af eks. PC (OJ-DV-PC-Tool)
- "C": Modbus tilslutning, Master, eksternt følerudstyr f.eks. PTH/VOC, +24VDC spændingsforsyning i stik (V+), OJ-DV-HMI-35T (i passive mode).

## RS-485 interface tilslutningskabel

Som Modbus kommunikationskabel kan anvendes:

- Rund kommunikationskabel som tilsluttes OJ DV i klemrækken, mærket "A" og "B".
- Fladkabel/telekabel, 6-leder, uskærmet, 30 AWG, 0,066 mm<sup>2</sup> eller tilsvarende fladkabel.



### Note

Hvis der anvendes fladkabel/telekabel, skal der monteres RJ12-stik i begge ender med specialværktøj.



### Note

VIGTIGT!: RJ12 stikkene i begge ender skal monteres således at begge stik følger den samme rækkefølge på ledningsfarver i kablet. Se fig. 2

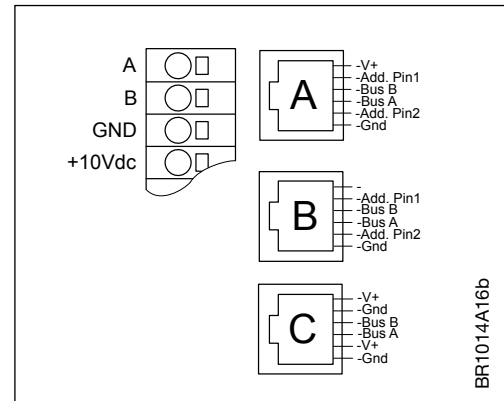
## Modbus register typer:

| Modbus Type            | Beskrivelse            | Reference |
|------------------------|------------------------|-----------|
| Coli Status (R/W)      | Discrete Output        | 0x        |
| Input Status (R)       | Discrete Input         | 1x        |
| Input register (R)     | 16-bit Input Register  | 3x        |
| Holding Register (R/W) | 16-bit Output Register | 4x        |

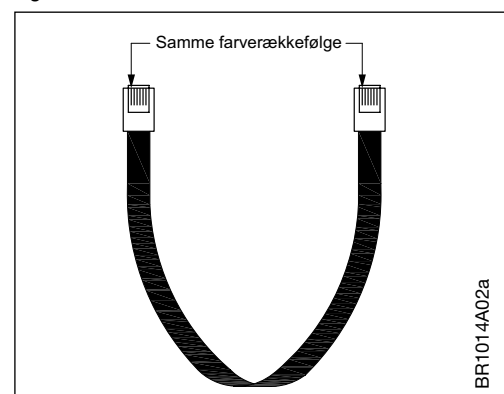
R=Read only

R/W = Read / Write

Figur 1



Figur 2











## Supporterede Modbus kommandoer

| Funktionskode | Beskrivelse  |
|---------------|--|
| 1             | Read Coil Status   |
| 2             | Read Input Status  |
| 3             | Read Holding Registers   |
| 4             | Read Input Registers   |
| 5             | Force Single Coil  |
| 6             | Preset Single Registers  |
| 8             | Diagnostics. Sub-function 00 Only - Return Query Data (loop back). |
| 15            | Force Multiple Coils   |
| 16            | Preset Multiple Registers  |


## Modbus adressering

Modbus adresseringen af OJ DV styringen foretages på 3 forskellige måder.

- Via stik "A" eller "B" adresseringspin (Add. Pin 1 + Add. Pin 2) – se placering af pins fig.1  
OJ DV styringen kan via adresseringspins tildeles adresseområdet: 0x36 (dec.54), 0x37 (dec.55), 0x38 (dec.56) og 0x39 (dec.57) se tabel 1

| Adr.<br>Pin.no | 0X36 (54 dec)   | 0X37 (55 dec)   | 0X38 (56 dec)   | 0X39 (57 dec)   |
|----------------|---|---|---|---|
| Adr.Pin1       |  |  |  |  |
| Adr.Pin2       |  |  |  |  |

 = Ingen forbindelse mellem "GND" og Adr.Pin1/ Adr.Pin2

 = Forbindelse mellem "GND" og Adr.Pin1/ Adr.Pin2

- Via OJ-Air2FanIO gennem "B"-stikket (Se instruktion for OJ-Air2FanIO)
- Via OJ-DV-HMI-35T menu (Se instruktion for OJ-DV-HMI-35T)
- Via OJ-DV-PC-Tool ved at skrive til Modbus Holding Register 4x0017 (Se instruktion for OJ-DV-PC-Tool)
- OJ DV supportere "broadcast" funktion på Modbus ID 0

## Kommunikationsparametre

Kommunikationsparametre kan indstilles med OJ-DV-HMI-35T samt via OJ-DV-PC-Tool (fabriksindstilling og indstillingsområde se tabel 2)

|                         | Område                                 | Enhed | Fabriksindstilling | Alternative fabriksindstillinger |
|-------------------------|--|-------|--------------------|----------------------------------|
| Adresse                 | 0-247                                  | n/a   | 54 dec.            | 0 dec.                           |
| Baudrate                | 9.600, 19.200, 38.400, 57.600, 115.200 | bps   | 38.400             | 115.200                          |
| Paritet                 | Ingen, lige, ulige                     | n/a   | Ingen              | Lige                             |
| Stop bit(s)             | 1, 2                                   | n/a   | 1                  | 1                                |
| Kommunikations time out | 0-240                                  | Sec.  | 10                 | 10                               |

n/a=ikke aktuel

Kontakt OJ Electronics A/S for yderligere informationer.

## Værdier ændres på eget ansvar:

Det er på eget ansvar, at ændre værdier og indstillinger, så det ikke forårsager nogen overlast og beskadigelse af produktet, motor eller ventilator.

**Coil Stat Bits** – Tilgængelige Coil Stat Bits i henhold til nedenstående tabel (se tabel 3)

## Standard Modbus (RTU)

### Coil Stat Bits: 23 (R/W)

0x01: Read

0x05: Write Single Coil (NOTE: ON => output value = 0xFF00)

0x0F: Write Multiple Coils

| Tabel 3  |         |                                   |       |  |
|----------|---------|-----------------------------------|-------|--|
| Register | Address | Function                          | Range | Active state   |
| 0x0001   | 0       | Motor ON/OFF                      | 0 - 1 | 1 = ON   |
| 0x0002   | 1       | Reset Alarms                      | 0 - 1 | 1 = Reset  |
| 0x0004   | 3       | FireMode                          | 0 - 1 | 1 = Active   |
| 0x0006   | 5       | Rotation                          | 0 - 1 | 1 = CW   |
| 0x0007   | 6       | Disable V_Ripple protection       | 0 - 1 | 1 = Disable  |
| 0x0008   | 7       | Control mode                      | 0 - 1 | 0 = Modbus, 1 = 0-10V  |
| 0x0009   | 8       | Use alternate comm. settings      | 0 - 1 | 1 = Alternate  |
| 0x0010   | 9       | Autodetect communication          | 0 - 1 | 1 = Enable   |
| 0x0011   | 10      | Analog start signal               | 0 - 1 | 1 = Enable   |
| 0x0012   | 11      | Invert analog speed input         | 0 - 1 | 1 = Invert   |
| 0x0013   | 12      | Allow using Field Weakening       | 0 - 1 | 1 = Allow FW   |
| 0x0014   | 13      | Allow using Brake Chopper         | 0 - 1 | 1 = Allow BC   |
| 0x0015   | 14      | Allow using Cooling Fan           | 0 - 1 | 1 = Allow Fan  |
| 0x0016   | 15      | 3 x 230V config                   | 0 - 1 | 0 = Voltage values from CCF<br>1 = Fixed values for 3 x 230V |
| 0x0017   | 16      | 1V start voltage                  | 0 - 1 | 0 = Start @ 2V<br>1 = Start @ 1V                             |
| 0x0018   | 17      | Very High Switch Frequency        | 0 - 1 | 0 = 8 kHz as "HI SF"<br>1 = 10 kHz as "HI SF"                |
| 0x0019   | 18      | Write protect config              | 0 - 1 | 0 = Allow change via Modbus<br>1 = "Lock" configuration      |
| 0x0020   | 19      | Clear PowerLog (Wh, kWh, MWh)     | 0 - 1 | 1 = Clear Power Log  |
| 0x0021   | 20      | Motor output off                  | 0 - 1 | 1 = Keep motor output off                                    |
| 0x0022   | 21      | Show alarm-type with LED-blink    | 0 - 1 | 1 = Use blink to show alarm                                  |
| 0x0023   | 22      | Autodetect Control mode           | 0 - 1 | 1 = Analog control with temporary Modbus override            |
| 0x0024   | 23      | Set Output Pin (If Output Cfg=5)  | 0 - 1 | 0 = Output "Low", 1 = "High"                                 |
| 0x0031   | 30      | Analog Firemode                   | 0 - 1 | 1 = active   |
| 0x0033   | 32      | Set Relay 1 (If IO_Opt1 config=5) | 0 - 1 | 0 = Relay1 Closed, 1 = Open                                  |
| 0x0034   | 33      | Set Relay 2 (If IO_Opt2 config=5) | 0 - 1 | 0 = Relay2 Closed, 1 = Open                                  |
| 0x0035   | 34      | Firmware Locked                   | 0 - 1 | 1 = Locked   |
| 0x0036   | 35      | BACnet Enable                     | 0 - 1 | 1 = Enabled  |
| 0x0037   | 36      | AutoDetect BACnet                 | 0 - 1 | 1 = Enabled  |

**Input Stat Bits** – Tilgængelige Input Stat Bits i henhold til nedenstående tabel (se tabel 4)

**Input Stat Bits: 29 (R)**

0x02: Read

| <b>Tabel 4</b>  |                |                              |              |                     |
|-----------------|----------------|------------------------------|--------------|---------------------|
| <b>Register</b> | <b>Address</b> | <b>Function</b>              | <b>Range</b> | <b>Active state</b> |
| 1x0001          | 0              | V LO Alarm                   | 0 - 1        | 1 = Alarm           |
| 1x0002          | 1              | V HI Alarm                   | 0 - 1        | 1 = Alarm           |
| 1x0003          | 2              | I HI Alarm (Motor out short) | 0 - 1        | 1 = Alarm           |
| 1x0004          | 3              | Temperature High             | 0 - 1        | 1 = Warning         |
| 1x0005          | 4              | Input Phase Error            | 0 - 1        | 1 = Warning         |
| 1x0006          | 5              | Rotor Blocked                | 0 - 1        | 1 = Alarm           |
| 1x0007          | 6              | Current Limit                | 0 - 1        | 1 = Warning         |
| 1x0008          | 7              | Voltage Limit                | 0 - 1        | 1 = Warning         |
| 1x0009          | 8              | Rotor Direction              | 0 - 1        | 1 = Alarm           |
| 1x0010          | 9              | EEPROM Error                 | 0 - 1        | 1 = Warning         |
| 1x0011          | 10             | Internal Stop                | 0 - 1        | 1 = Alarm (Stop)    |
| 1x0012          | 11             | Earth fault (H5 only)        | 0 - 1        | 1 = Alarm           |
| 1x0013          | 12             | Brake Chopper Fault          | 0 - 1        | 1 = Warning         |
| 1x0014          | 13             | Motor Phase Error            | 0 - 1        | 1 = Alarm           |
| 1x0015          | 14             | Communication error MOC      | 0 - 1        | 1 = Alarm           |
| 1x0016          | 15             | V Ripple                     | 0 - 1        | 1 = Warning         |
| 1x0017          | 16             | Digital Input 1              | 0 - 1        | 1 = HI              |
| 1x0018          | 17             | Digital Input 2              | 0 - 1        | 1 = HI              |
| 1x0019          | 18             | Ext. 24V supply overload     | 0 - 1        | 1 = Overload        |
| 1x0020          | 19             | MOC in bootloader            | 0 - 1        | 1 = Alarm           |
| 1x0021          | 20             | Digital Input 3 (IOM)        | 0 - 1        | 1 = HI*             |
| 1x0022          | 21             | Digital Input 4 (IOM)        | 0 - 1        | 1 = HI*             |
| 1x0023          | 22             | Communication error IOM      | 0 - 1        | 1 = Warning*        |
| 1x0024          | 23             | Motor Overheat (IOM)         | 0 - 1        | 1 = Alarm           |
| 1x0025          | 24             | Windmilling                  | 0 - 1        | 1 = Warning         |
| 1x0026          | 25             | Rotation OK                  | 0 - 1        | 1 = OK              |
| 1x0027          | 26             | IO Config mismatch           | 0 - 1        | 1 = Warning         |
| 1x0028          | 27             | Config write attempt         | 0 - 1        | 1 = Detected        |
| 1x0029          | 28             | Unsaved UserData             | 0 - 1        | 1 = Unsaved         |

\*: Only if one of the IOM output functions is enabled

**Input Registers** – Tilgængelige Input Registers i henhold til nedenstående tabel (se tabel 5 og 6)

**Input Registers: 34 (R)**

0x04: Read

| Tabel 5  |         |                       |               |                    |      |                    |      |
|----------|---------|-----------------------|---------------|--------------------|------|--------------------|------|
| Register | Address | Function              | Range         | EC-config (PM)     |      | FC-config (AC)     |      |
|          |         |                       |               | Resolution         | Unit | Resolution         | Unit |
| 3x0001   | 0       | Drive Type            | 1000 - 65535  | 1                  | -    | 1                  | -    |
| 3x0002   | 1       | AOC SW version        | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0003   | 2       | MOC SW version        | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0004   | 3       | PrcOut                | 0 - 10000     | 0.01               | %    | 0.01               | %    |
| 3x0005   | 4       | RPMOut                | 0 - 3000      | 1                  | RPM  | 0.01               | Hz   |
| 3x0006   | 5       | Intern Temp           | -5000 - 15000 | 0.01               | °C   | 0.01               | °C   |
| 3x0007   | 6       | V In (RMS)            | 0 - 500       | 1                  | V    | 1                  | V    |
| 3x0008   | 7       | I Out                 | 0 - 65535     | 1                  | mA   | 1                  | mA   |
| 3x0009   | 8       | Power In (filtered)   | 0 - 20000     | 1                  | W    | 1                  | W    |
| 3x0010   | 9       | I Ripple              | 0 - 65535     | 1                  | mA   | 1                  | mA   |
| 3x0011   | 10      | Operation Minutes     | 0 - 1439      | 1                  | Min. | 1                  | Min. |
| 3x0012   | 11      | Operation Day         | 0 - 9999      | 1                  | Day  | 1                  | Day  |
| 3x0013   | 12      | V Ripple              | 0 - 500       | 1                  | V    | 1                  | V    |
| 3x0014   | 13      | Config file variant   | AA - ZZ       | 2 ASCII characters |      | 2 ASCII characters |      |
| 3x0015   | 14      | Config file version   | 100 - 32000   | 0.01               | -    | 0.01               | -    |
| 3x0016   | 15      | ExternSet             | 0 - 10000     | 1                  | mV   | 1                  | mV   |
| 3x0017   | 16      | Power Supply          | 0 - 600       | 1                  | V    | 1                  | V    |
| 3x0018   | 17      | OverVoltageCount      | 0 - 65535     | 1                  | -    | 1                  | -    |
| 3x0019   | 18      | AOC SW variant        | -             | -                  | -    | -                  | -    |
| 3x0020   | 19      | AOC Boot SW           | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0021   | 20      | MOC Boot SW           | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0022   | 21      | Motor Cfg. Var.       | 0 - 65535     | 1                  | -    | 1                  | -    |
| 3x0023   | 22      | Motor Cfg. Ver.       | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0024   | 23      | Fan Cfg. Var.         | 0 - 65535     | 1                  | -    | 1                  | -    |
| 3x0025   | 24      | Fan Cfg. Ver.         | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0026   | 25      | User Data Var.        | 0 - 65535     | 1                  | -    | 1                  | -    |
| 3x0027   | 26      | User Data Ver.        | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0028   | 27      | IOM SW version        | 0 - 65535     | 0.01               | -    | 0.01               | -    |
| 3x0029   | 28      | V DC Bus (Peak)       | 0 - 800       | 1                  | V    | 1                  | V    |
| 3x0030   | 29      | V Motor (Peak)        | 0 - 500       | 1                  | V    | 1                  | V    |
| 3x0031   | 30      | Power In (unfiltered) | 0 - 15000     | 1                  | W    | 1                  | W    |
| 3x0032   | 31      | Power Consumpt.       | 0 - 999       | 1                  | Wh   | 1                  | Wh   |
| 3x0033   | 32      | Power Consumpt.       | 0 - 999       | 1                  | kWh  | 1                  | kWh  |
| 3x0034   | 33      | Power Consumpt.       | 0 - 65535     | 1                  | MWh  | 1                  | MWh  |
| 3x0039   | 38      | HMI Device status     | 0 - 65525     | -                  | -    | -                  | -    |
| 3x0040   | 39      | HMI SW version        | 100 - 32000   | 0.01               | -    | 0.01               | -    |
| 3x0041   | 40      | IOM Ain2 current      | 0 - 20000     | 1                  | µA   | 1                  | µA   |
| 3x0042   | 41      | BACnetSWVersion       | 0-65535       | 0.01               | -    | 0.01               | -    |

**Input Registers: 18 (R)**

0x04: Read

**Tabel 6**

| Register | Address | Function                    | Resolution | Resolution | Unit           |
|----------|---------|-----------------------------|------------|------------|----------------|
| 3x8193   | 8192    | Production week             | 0100-5399  | 1          | WWYY           |
| 3x8194   | 8193    | Production order number LO  | 0-9999     | 1          | -              |
| 3x8195   | 8194    | Production order number HI  | 0-9999     | 10000      | -              |
| 3x8196   | 8195    | Serial number of batch      | 0-65535    | 1          | -              |
| 3x8197   | 8196    | Product name length + Char0 | 0-65535    | -          | 2 x ACSII Char |
| 3x8198   | 8197    | Char1 + Char2               | 0-65535    | -          | 2 x ACSII Char |
| 3x8199   | 8198    | Char3 + Char4               | 0-65535    | -          | 2 x ACSII Char |
| 3x8200   | 8199    | Char5 + Char6               | 0-65535    | -          | 2 x ACSII Char |
| 3x8201   | 8200    | Char7 + Char8               | 0-65535    | -          | 2 x ACSII Char |
| 3x8202   | 8201    | Char9 + Char10              | 0-65535    | -          | 2 x ACSII Char |
| 3x8203   | 8202    | Char11 + Char12             | 0-65535    | -          | 2 x ACSII Char |
| 3x8204   | 8203    | Char13 + Char14             | 0-65535    | -          | 2 x ACSII Char |
| 3x8205   | 8204    | Char15 + Char16             | 0-65535    | -          | 2 x ACSII Char |
| 3x8206   | 8205    | Char17 + Char18             | 0-65535    | -          | 2 x Ascii char |
| 3x8207   | 8206    | Char19 + Char20             | 0-65535    | -          | 2 x ACSII Char |
| 3x8208   | 8207    | Char21 + Char22             | 0-65535    | -          | 2 x ACSII Char |
| 3x8209   | 8208    | Char23 + Char24             | 0-65535    | -          | 2 x ACSII Char |
| 3x8210   | 8209    | Char25 + Char26             | 0-65535    | -          | 2 x ACSII Char |
| 3x8211   | 8210    | Char27 + "NULL"             | 0-65535    | -          | 2 x ACSII Char |

**Holding Registers** – Tilgængelige Holding Registers i henhold til nedenstående tabel (se tabel 7)

**Holding Registers: 40 (R/W)**

0x03: Read

0x06: Write Single

0x10: Write Multiple

**Tabel 7**

|          |         |                   | EC-configuration |            |      | FC-configuration |            |      |
|----------|---------|-------------------|------------------|------------|------|------------------|------------|------|
| Register | Address | Function          | Range            | Resolution | Unit | Range            | Resolution | Unit |
| 4x0001   | 0       | Setpoint / PrcSet | 0 - 10000        | 0.01       | %    | 0 - 10000        | 0.01       | %    |
| 4x0002   | 1       | Min. RPM          | 0 - 5000         | 1          | RPM  | 0 - 12000        | 0.01       | Hz   |
| 4x0003   | 2       | Max. RPM          | 0 - 5000         | 1          | RPM  | 0 - 12000        | 0.01       | Hz   |
| 4x0004   | 3       | UpRampTime        | 15 - 240         | 1          | Sec. | 15 - 240         | 1          | Sec. |
| 4x0005   | 4       | DownRampTime      | 15 - 240         | 1          | Sec. | 15 - 240         | 1          | Sec. |
| 4x0008   | 7       | Max I Out         | 0 - ?            | 1          | mA   | 1000 - 65000     | 1          | mA   |
| 4x0009   | 8       | Boost I Out       | n/a              | 1          | mA   | 1000 - 65000     | 1          | mA   |
| 4x0011   | 10      | SwitchMode        | 0                | AutoSpeed  |      | 0                | AutoSpeed  |      |
|          |         |                   | 1                | 4          | kHz  | 1                | 4          | kHz  |
|          |         |                   | 2                | 8          | kHz  | 2                | 8          | kHz  |
|          |         |                   | 3                | AutoTemp   |      | 3                | AutoTemp   |      |
| 4x0012   | 11      | U minHz           | n/a              | n/a        | n/a  | 0 - 250          | 1          | V    |
| 4x0013   | 12      | Freq Umax         | n/a              | n/a        | n/a  | 0 - 12000        | 0.01       | Hz   |
| 4x0014   | 13      | AutoSF_Change     | 0 - 10000        | 0.01       | %    | 0 - 10000        | 0.01       | %    |
| 4x0015   | 14      | ExpSet            | n/a              | n/a        | n/a  | 0 - 200          | 1          | -    |
| 4x0016   | 15      | Drive Type        | 0, 100 - 65000   | 1          | -    | 1 - 99           | 1          | -    |

"?" = Value depends on hardware variant

"n/a" = not applicable

# APPLICATION NOTE OJ DV Modbus protokol

| Continued table 7 |         |                     | Common for EC (PM) & FC (AC) configuration |                                       |      |
|-------------------|---------|---------------------|--|---------------------------------------|------|
| Register          | Address | Function            | Range / Value                              | Resolution / Option                   | Unit |
| 4x0017            | 16      | Modbus ID           | 1 - 247                                    | 1                                     | -    |
| 4x0018            | 17      | ModbusResponseDelay | 0 - 200                                    | 1                                     | ms   |
| 4x0020            | 19      | Number of retries   | -1 - 100                                   | 1                                     | -    |
| 4x0022            | 21      | CommTimeout         | 0 - 240                                    | 1                                     | Sec. |
| 4x0023            | 22      | CommRate            | 0  | 9600                                  | bps  |
|                   |         |                     | 1  | 19200                                 | bps  |
|                   |         |                     | 2  | 38400                                 | bps  |
|                   |         |                     | 3  | 115200                                | bps  |
|                   |         |                     | 4  | 57600                                 | bps  |
| 4x0024            | 23      | Parity              | 0  | None                                  | -    |
|                   |         |                     | 1  | Odd                                   | -    |
|                   |         |                     | 2  | Even                                  | -    |
| 4x0025            | 24      | Stop Bits           | 0  | INVALID                               | -    |
|                   |         |                     | 1  | 1                                     | -    |
|                   |         |                     | 2  | 2                                     | -    |
| 4x0026            | 25      | DigIn1 config       | 0  | Disabled                              | -    |
|                   |         |                     | 1  | Start/stop                            | -    |
|                   |         |                     | 2  | AlarmReset                            | -    |
|                   |         |                     | 3  | MB_IDs_2                              | -    |
|                   |         |                     | 4  | Invert 0-10V<br>(open = inverted)     | -    |
|                   |         |                     | 5  | Rotation                              | -    |
|                   |         |                     | 6  | Firemode                              | -    |
|                   |         |                     | 7  | Motor Overheat                        | -    |
|                   |         |                     | 8  | Invert 0-10V<br>(open = not inverted) | -    |
|                   |         |                     | 9  | Motor output off                      | -    |
|                   |         |                     | 10   | Modbus Disable                        | -    |
|                   |         |                     | 11   | FiremodeMax                           | -    |
|                   |         |                     | 12   | Digital Dual Speed                    | -    |
|                   |         |                     | 13   | Modbus Enable                         | -    |
|                   |         |                     | 14   | Modbus ID Offset 1                    | -    |
|                   |         |                     | 15   | Modbus ID Offset 2                    | -    |
|                   |         |                     | 16   | Modbus ID Offset 10                   | -    |
| 4x0027            | 26      | DigIn2 config       | 0  | Disabled                              | -    |
|                   |         |                     | 1  | Start/stop                            | -    |
|                   |         |                     | 2  | AlarmReset                            | -    |
|                   |         |                     | 3  | MB_IDs_2                              | -    |
|                   |         |                     | 4  | Invert 0-10V<br>(open = inverted)     | -    |
|                   |         |                     | 5  | Rotation                              | -    |
|                   |         |                     | 6  | Firemode                              | -    |
|                   |         |                     | 7  | Motor Overheat                        | -    |
|                   |         |                     | 8  | Invert 0-10V<br>(open = not inverted) | -    |
|                   |         |                     | 9  | Motor output off                      | -    |
|                   |         |                     | 10   | Modbus Disable                        | -    |
|                   |         |                     | 11   | FiremodeMax                           | -    |
|                   |         |                     | 12   | Digital Dual Speed                    | -    |
|                   |         |                     | 13   | Modbus Enable                         | -    |
|                   |         |                     | 14   | Modbus ID Offset 1                    | -    |
|                   |         |                     | 15   | Modbus ID Offset 2                    | -    |
|                   |         |                     | 16   | Modbus ID Offset 10                   | -    |
| 4x0028            | 27      | DigOut config       | 0  | Disabled                              | -    |



| Continued table 7 |         |                      | Common for EC (PM) & FC (AC) configuration |                                       |      |
|-------------------|---------|----------------------|--|---------------------------------------|------|
| Register          | Address | Function             | Range / Value                              | Resolution / Option                   | Unit |
|                   |         |                      | 1  | TachoOut                              | -    |
|                   |         |                      | 2  | RunningStart                          | -    |
|                   |         |                      | 3  | AlarmOut ( <b>NO</b> )                | -    |
|                   |         |                      | 4  | RunningSpin                           | -    |
|                   |         |                      | 5  | Set output status via coil stat 24    | -    |
|                   |         |                      | 6  | Single Error Alarm                    | -    |
|                   |         |                      | 7  | AlarmOut ( <b>NC</b> )                | -    |
| 4x0029            | 28      | MotorConfigVar       | 0 - 65534                                  | 1                                     | -    |
| 4x0030            | 29      | FanConfigVar         | 0 - 65534                                  | 1                                     | -    |
| 4x0031            | 30      | DigIn3 config (IOM)  | 0  | Disabled                              | -    |
|                   |         |                      | 1  | Start/stop                            | -    |
|                   |         |                      | 2  | AlarmReset                            | -    |
|                   |         |                      | 3  | Disabled                              | -    |
|                   |         |                      | 4  | Invert 0-10V                          | -    |
|                   |         |                      | 5  | (open = inverted)                     | -    |
|                   |         |                      | 6  | Rotation                              | -    |
|                   |         |                      | 7  | Firemode                              | -    |
|                   |         |                      | 8  | N/A                                   | -    |
|                   |         |                      | 9  | Invert 0-10V                          | -    |
|                   |         |                      | 10   | (open = not inverted)                 | -    |
|                   |         |                      | 11   | Motor output off                      | -    |
|                   |         |                      | 12   | Modbus Disable                        | -    |
|                   |         |                      | 13   | Modbus Enable                         | -    |
|                   |         |                      | 14   | Modbus ID Offset 1                    | -    |
|                   |         |                      | 15   | Modbus ID Offset 2                    | -    |
|                   |         |                      | 16   | Modbus ID Offset 10                   | -    |
| 4x0032            | 31      | DigIn4 config (IOM)  | 0  | Disabled                              | -    |
|                   |         |                      | 1  | Start/stop                            | -    |
|                   |         |                      | 2  | AlarmReset                            | -    |
|                   |         |                      | 3  | Disabled                              | -    |
|                   |         |                      | 4  | Invert 0-10V<br>(open = inverted)     | -    |
|                   |         |                      | 5  | Rotation                              | -    |
|                   |         |                      | 6  | Firemode                              | -    |
|                   |         |                      | 7  | N/A                                   | -    |
|                   |         |                      | 8  | Invert 0-10V<br>(open = not inverted) | -    |
|                   |         |                      | 9  | Motor output off                      | -    |
|                   |         |                      | 10   | Modbus Disable                        | -    |
|                   |         |                      | 11   | FiremodeMax                           | -    |
|                   |         |                      | 12   | Digital Dual Speed                    | -    |
|                   |         |                      | 13   | Modbus Enable                         | -    |
|                   |         |                      | 14   | Modbus ID Offset 1                    | -    |
|                   |         |                      | 15   | Modbus ID Offset 2                    | -    |
|                   |         |                      | 16   | Modbus ID Offset 10                   | -    |
| 4x0033            | 32      | IO_Opt1 config (IOM) | 0  | Disabled                              | -    |

| Continued table 7 |         |                         | Common for EC (PM) & FC (AC) configuration |  |        |
|-------------------|---------|-------------------------|--|--|--------|
| Register          | Address | Function                | Range / Value                              | Resolution / Option                    | Unit   |
|                   |         |                         | 1  | N/A                                    | -      |
|                   |         |                         | 2  | RunningStart                           | Output |
|                   |         |                         | 3  | AlarmOut                               | Output |
|                   |         |                         | 4  | RunningSpin                            | Output |
|                   |         |                         | 5  | Set output status via coil stat 0x0024 | Output |
|                   |         |                         | 6  | Single Error Alarm                     | Output |
|                   |         |                         | 100  | Disabled                               | -      |
|                   |         |                         | 101  | Start/Stop                             | Input  |
|                   |         |                         | 102  | AlarmReset                             | Input  |
|                   |         |                         | 103  | Disabled                               | Input  |
|                   |         |                         | 104  | Invert 0-10V (open = inverted)         | Input  |
|                   |         |                         | 105  | Rotation                               | Input  |
|                   |         |                         | 106  | Firemode                               | Input  |
|                   |         |                         | 107  | N/A                                    | -      |
|                   |         |                         | 108  | Invert 0-10V (open = not inverted)     | Input  |
|                   |         |                         | 109  | Motor output off                       | Input  |
|                   |         |                         | 110  | N/A                                    | -      |
|                   |         |                         | 111  | FiremodeMax                            | Input  |
|                   |         |                         | 112  | Digital Dual Speed                     | Input  |
|                   |         |                         | 113  | Modbus Enable                          | -      |
|                   |         |                         | 114  | Modbus ID Offset 1                     | -      |
|                   |         |                         | 115  | Modbus ID Offset 2                     | -      |
|                   |         |                         | 116  | Modbus ID Offset 10                    | -      |
| 4x0034            | 33      | IO_Opt2 config (IOM)    | 0  | Disabled                               | -      |
|                   |         |                         | 1  | N/A                                    | -      |
|                   |         |                         | 2  | RunningStart                           | Output |
|                   |         |                         | 3  | AlarmOut                               | Output |
|                   |         |                         | 4  | RunningSpin                            | Output |
|                   |         |                         | 5  | Set output status via coil stat 24     | Output |
|                   |         |                         | 6  | Single Error Alarm                     | Output |
|                   |         |                         | 100  | Disabled                               | -      |
|                   |         |                         | 101  | Start/Stop                             | Input  |
|                   |         |                         | 102  | AlarmReset                             | Input  |
|                   |         |                         | 103  | Disabled                               | Input  |
|                   |         |                         | 104  | Invert 0-10V (open = inverted)         | Input  |
|                   |         |                         | 105  | Rotation                               | Input  |
|                   |         |                         | 106  | Firemode                               | Input  |
|                   |         |                         | 107  | N/A                                    | -      |
|                   |         |                         | 108  | Invert 0-10V (open = not inverted)     | Input  |
|                   |         |                         | 109  | Motor output off                       | Input  |
|                   |         |                         | 110  | N/A                                    | -      |
|                   |         |                         | 111  | FiremodeMax                            | Input  |
|                   |         |                         | 112  | Digital Dual Speed                     | Input  |
|                   |         |                         | 113  | Modbus Enable                          | -      |
|                   |         |                         | 114  | Modbus ID Offset 1                     | -      |
|                   |         |                         | 115  | Modbus ID Offset 2                     | -      |
|                   |         |                         | 116  | Modbus ID Offset 10                    | -      |
| 4x0035            | 34      | AnalogOut1 config (IOM) | 0  | Disabled                               | -      |
|                   |         |                         | 1  | ActSpeed                               | -      |
|                   |         |                         | 2  | TBD                                    | -      |

| Continued table 7 |         |  | Common for EC (PM) & FC (AC) configuration |                           |      |
|-------------------|---------|--|--|---------------------------|------|
| Register          | Address | Function   | Range / Value                              | Resolution / Option       | Unit |
| 4x0036            | 35      | Thermistor config (IOM)                          | 0  | Disabled                  | -    |
|                   |         |  | 1  | Motor Overheat PTC        | -    |
|                   |         |  | 2  | TBD                       | -    |
| 4x0037            | 36      | AnalogIn2 config (IOM)                           | 0  | Disabled                  | -    |
|                   |         |  | 1  | SpeedControl<br>4 - 20 mA | -    |
|                   |         |  | 2  | TBD                       | -    |
| 4x0038            | 37      | Thermistor threshold                             | 1 - 65000                                  | 1                         | Ω    |
| 4x0039            | 38      | Max Windmilling Time                             | 0 - 65000                                  | 1                         | Sec  |
| 4x0049            | 48      | Jumping Frequency_Low 1<br>or Dual Speed 1       | MinRPM – MaxRPM                            | 1                         | RPM  |
| 4x0050            | 49      | Jumping Frequency_High 1<br>or Dual Speed 2      | MinRPM – MaxRPM                            | 1                         | RPM  |
| 4x0051            | 50      | Jumping Frequency_Low 2                          | MinRPM – MaxRPM                            | 1                         | RPM  |
| 4x0052            | 51      | Jumping Frequency_High 2                         | MinRPM – MaxRPM                            | 1                         | RPM  |
| 4x0053            | 52      | Jumping Frequency_Low 3<br>or Firemode Max speed | MinRPM – MaxRPM                            | 1                         | RPM  |
| 4x0054            | 53      | Jumping Frequency_High 3                         | MinRPM – MaxRPM                            | 1                         | RPM  |
| 4x0057            | 56      | BacnetMAC  | 0-127                                      |                           | -    |
| 4x0058            | 57      | BacnetMaxMaster                                  | 1-127                                      |                           | -    |
| 4x0059            | 58      | BacnetDeviceObjectInstance_Low                   | 0- 4194302                                 |                           | -    |
| 4x0060            | 59      | BacnetDeviceObjectInstance_High                  | (2 <sup>22</sup> -2)                       |                           | -    |

"TBD"= To be done – for future use