2024

HMI – H100 Modbus RTU Haberleşme

ANT EĞİTİM

ANT MÜHENDİSLİK SAN. VE TİC. A.Ş. | 2024

İçindekiler Tablosu

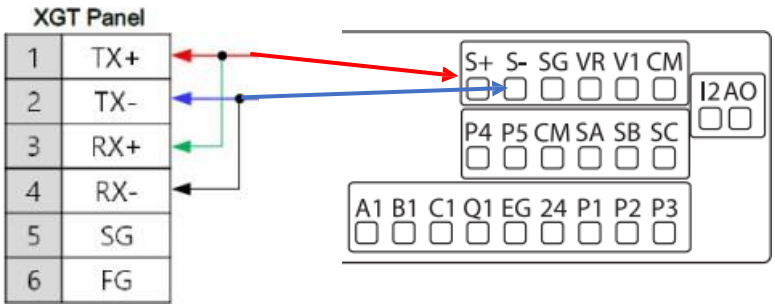
HMI – H100 Modbus RTU Haberleşme

Bağlantı Şeması

HMI üzerinde Tx+ ile Rx+ köprülüyoruz, Tx- ile Rx- köprülüyoruz.

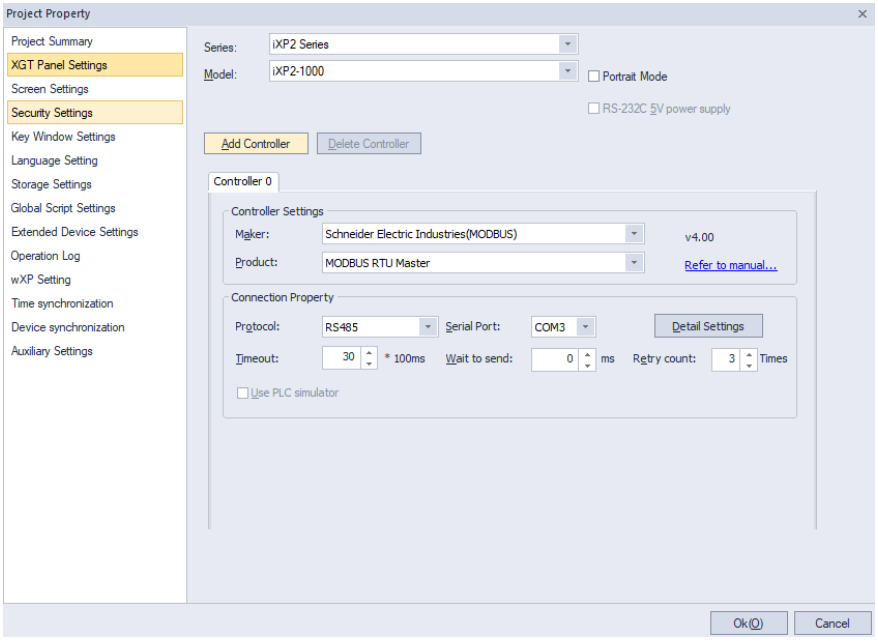
Tx+'dan çektiğimiz kabloyu S100 üzerindeki **S+'ya** bağlıyoruz.

Tx-'den çektiğimiz kabloyu S100 üzerindeki **S-**'ye bağlıyoruz.

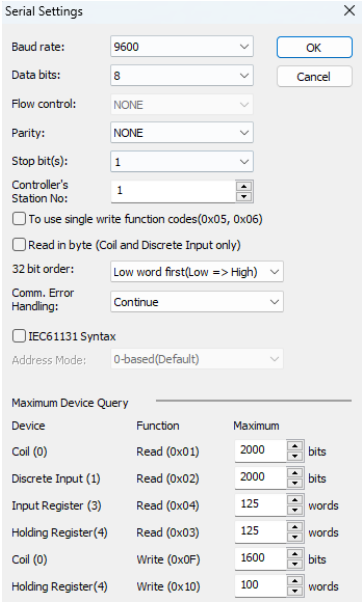


XP – BUILDER HABERLEŞME AYARLARI

İlk olarak Xgt Panel Settings bölümünde **Modbus RTU Master** seçimini yapıyoruz. Haberleşme tipi olarak **RS485**, Port olarak da kullandığımız portu seçiyoruz.

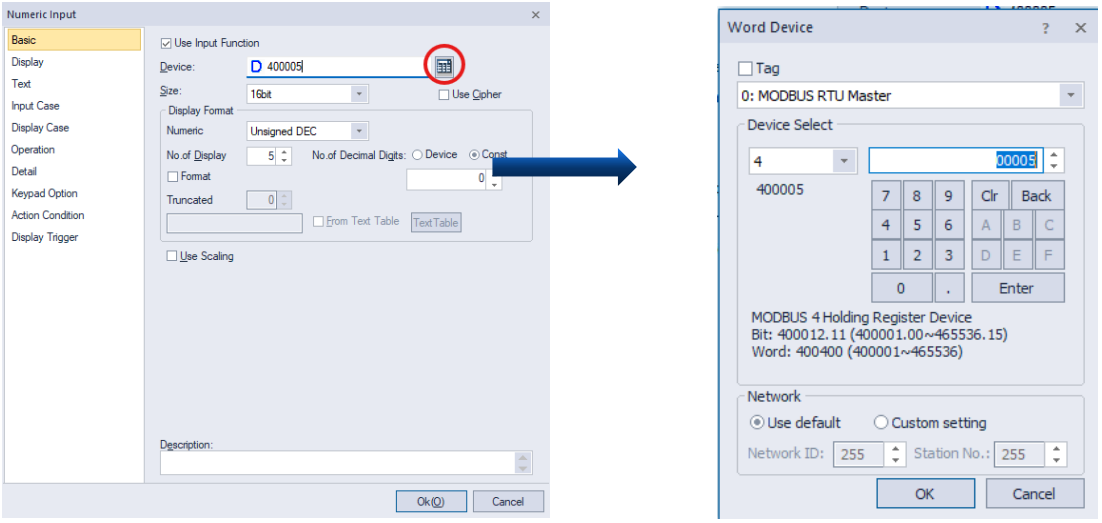


Ardından Detail Settings tıklıyoruz burada haberleşeceğimiz cihaz ile parametrelerin aynı olması gerekiyor.



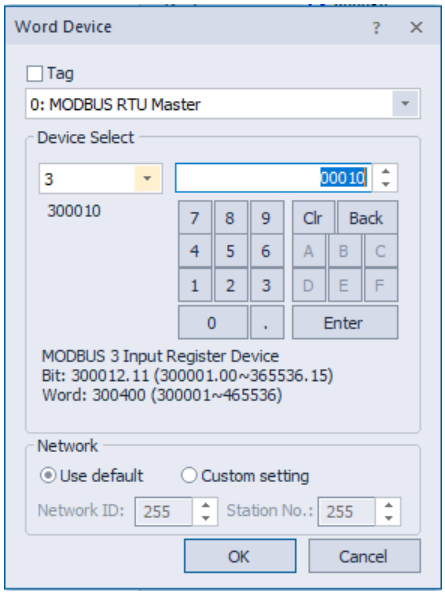
Yazma Parametreleri

Kullanmak istediğimiz parametreleri yazma yapacaklarımız için **numeric input** diyoruz. Ardından yuvarlak içine alınmış yere tıklıyoruz. Burada yazma adresleri 4 ile başlar H100 manuelinden kullanacağımız adreslere bakıyoruz örnekte bizim yaptığımız **Command Frequency** adresi manuelde yazan değer ile birebir şekilde ilerlemektedir.



Okuma Parametreleri

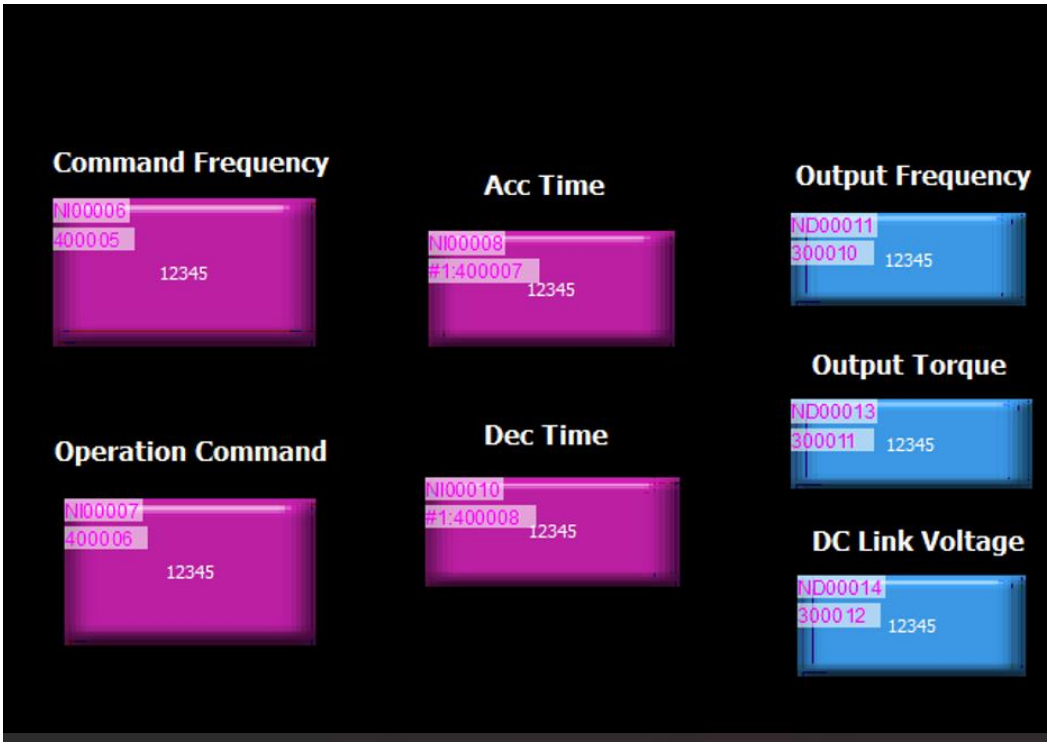
Eğer **okuma** adresleri görmek istiyorsak bunun için **numeric display** kullanacağız. Okuma adresleri **3 ile başlar** burada Output Frequency değerini okumak istiyoruz. H100 manuelinde adresler hex olarak yazılmaktadır. HMI ekranında yazarken bunları **decimale** çevirmemiz gerekiyor. Manuelde A olarak gözüken output frequency burada 300010 olarak giriyoruz.

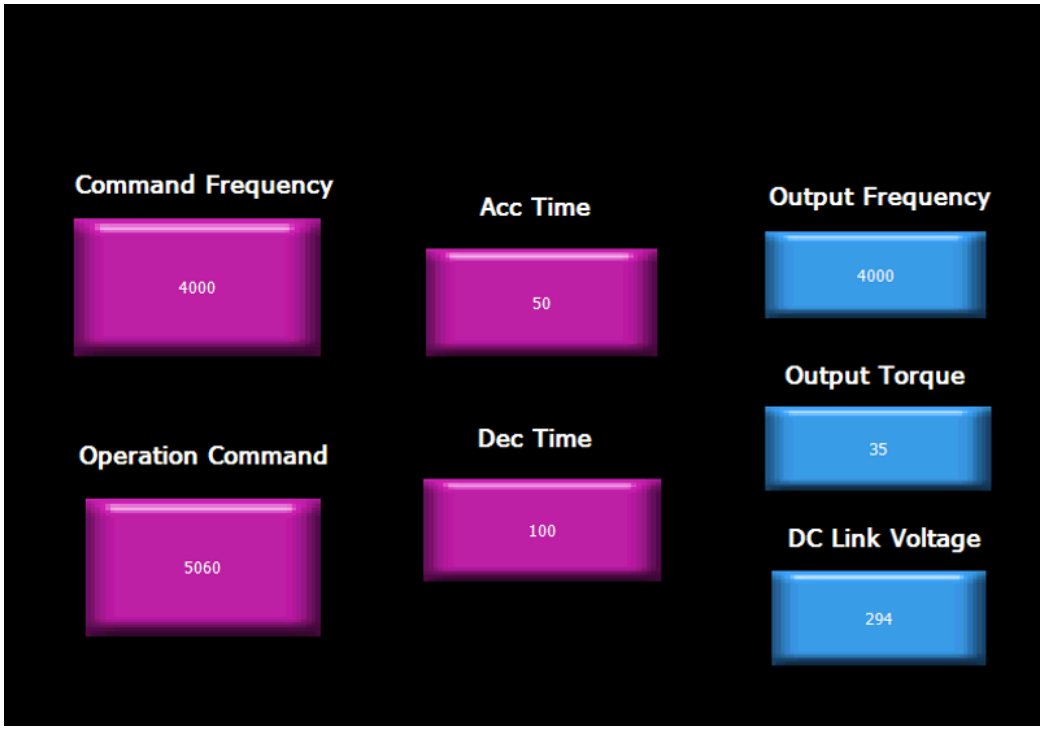


Haberleşme kurduğumuz cihaz sayısı arttıkça Station No bölümünü artırmamız gerekiyor. Buna karşılık olarak da adreslerin başına örneğin 2.cihaz için #2:300010 olarak yazacağız.

Örnek:

Çoğunlukla kullanılan parametrelerle ilgili yapılan program;





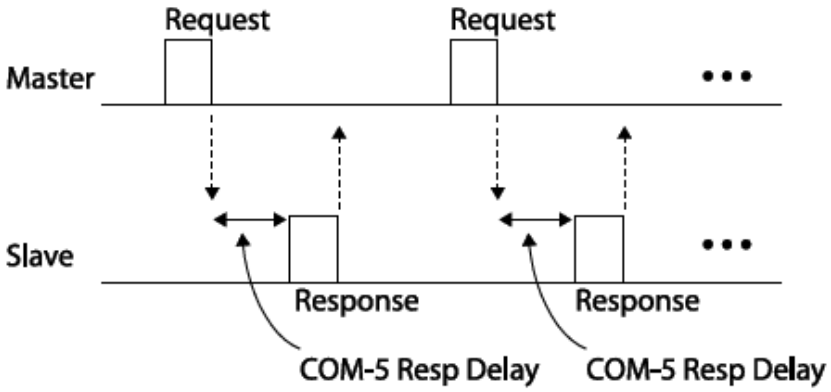
H100 CM Parametreleri

Group	Code	Name	LCD Display	Parameter Setting		Setting range	Unit
COM	01	Built-in communication inverter ID	Int485 St ID	1		1–250	-
Group	**Code**	**Name**	**LCD Display**	**Parameter Setting**		**Setting range**	**Unit**
	02	Built-in communication protocol	Int485 Proto	0	ModBus RTU	0, 2,4,5	-
	03	Built-in communication speed	Int485 BaudR	3	9600 bps	0–8	-
	04	Built-in communication frame setting	Int485 Mode	0	D8/PN/S1	0–3	-
	05	Transmission delay after reception	Resp Delay	5		0–1000	msec

Communication Parameters Setting Details

<table>
<tr><th>Code</th><th>Description</th></tr>
<tr><td>COM-01 Int485 St ID</td><td>Sets the inverter station ID between 1 and 250.
※Using the BACnet, maximum number of station ID is Com-20 Max Master and maximum number of COM-20 is 127.</td></tr>
<tr><td>COM-02 Int485 Proto</td><td>Select one of the four built-in protocols: Modbus-RTU, LS INV 485, BACnet or Metasys-N2

<table>
<tr><td colspan="2">Setting</td><td>Function</td></tr>
<tr><td>0</td><td>Modbus-RTU</td><td>Modbus-RTU compatible protocol</td></tr>
<tr><td>2</td><td>LS INV 485</td><td>Dedicated protocol for the LS inverter</td></tr>
<tr><td>4</td><td>BACnet</td><td>BAC net protocol</td></tr>
<tr><td>5</td><td>Metasys-N2</td><td>Metasys-N2 protocol</td></tr>
</table></td></tr>
<tr><td>COM-03 Int485 BaudR</td><td>Set a communication setting speed up to 115,200 bps.
The maximum setting range changes depending on the protocol.
<table>
<tr><td>Setting</td><td>Communication Speed</td></tr>
<tr><td>0</td><td>1200bps</td></tr>
<tr><td>1</td><td>2400bps</td></tr>
<tr><td>2</td><td>4800bps</td></tr>
<tr><td>3</td><td>9600bps</td></tr>
<tr><td>4</td><td>19200bps</td></tr>
<tr><td>5</td><td>38400bps</td></tr>
<tr><td>6</td><td>56Kbps(57600bps)</td></tr>
<tr><td>7</td><td>76.8Kbps</td></tr>
<tr><td>8</td><td>115Kbps(115200bps)</td></tr>
</table>
※If the COM-02 Int485 Prtoto setting is BACnet, the available communication speed settings are 9600bps, 19200bps, 76.8kbps.</td></tr>
</table>

<table>
<tr><th>Code</th><th>Description</th></tr>
<tr><td></td><td>※ If the COM-02 Int485 Prtoto setting is Metasys-N2, the communication speed is fixed to 9600bps and COM-03 Int485 BaudR is not shown.</td></tr>
<tr><td>COM-04 Int485 Mode</td><td>Set a communication configuration. Set the data length, parity check method, and the number of stop bits.
<table>
<tr><td colspan="2">Setting</td><td>Function</td></tr>
<tr><td>0</td><td>D8/PN/S1</td><td>8-bit data / no parity check / 1 stop bit</td></tr>
<tr><td>1</td><td>D8/PN/S2</td><td>8-bit data / no parity check / 2 stop bits</td></tr>
<tr><td>2</td><td>D8/PE/S1</td><td>8-bit data / even parity / 1 stop bit</td></tr>
<tr><td>3</td><td>D8/PO/S1</td><td>8-bit data / odd parity / 1 stop bit</td></tr>
</table>
※ If the COM-02 Int485 Prtoto setting is Metasys-N2, the communication frame composition is fixed to D8/PN/S1 and COM-04 Int485 Mode is not visible.</td></tr>
<tr><td>COM-05 Resp Delay</td><td>Set the response time for the slave (inverter) to react to the request from the master. Response time is used in a system where the slave device response is too fast for the master device to process. Set this code to an appropriate value for smooth master-slave communication.
 
</td></tr>
</table>

H100 DRV ve FRQ Parametreleri

DRV-06 Cmd Source kodunu 3'e (Int 485) ve DRV-07 Freq Ref Src kodunu 6'ya (Int485) aracılığıyla çalışma komutu ve frekans için ortak alan parametrelerini ayarlayabilirsiniz.

Group	Code	Name	LCD Display	Parameter Setting		Setting range	Unit
DRV	06	Command source	Cmd Source	3	Int 485	0–5	-
	07	Frequency setting method	Freq Ref Src	6	Int 485	0–9	-

Haberleşme Adresleri

Comm.	Parameter	Scale	Unit	R/W	Assigned Content by Bit	
oh0000	Inverter model	-	-	R	F : H100	
oh0001	Inverter capacity	-	-	R	4: 5.5kW, 5: 7.5kW 6: 11kW, 7: 15kW, 8: 18.5kW 9: 22kW 10: 30kW 11: 37kW 12: 45kW 13: 55kW, 14: 75kW 15: 90kW	
oh0002	Inverter input voltage	-	-	R	0: 220V product 1: 440V product	
oh0003	Version	-	-	R	(Example) oh0064: Version 1.00	
					(Example) oh0065: Version 1.01	
oh0004	Reserved	-	-	R/W	-	
oh0005	Command frequency	0.01	Hz	R/W	-	
oh0006	Operation command (option)	-	-	R	B15	Reserved
					B14	0: Keypad Freq,
					B13	2-8: Terminal block multi-step speed
					B12	
					B11	17: Up, 18: Down
					B10	19: STEADY
					B9	22: V1, 24: V2, 25: I2, 26: PULSE 27: Built-in 485 28: Communication option 30: JOG, 31: PID
					B8	0: Keypad
					B7	1: Fx/Rx-1
					B6	2: Fx/Rx-2 3: Built-in 485 4: Communication option 5 : Time Event
				R/W	B5	Reserved
					B4	Emergency stop
					B3	W: Trip initialization (0→1), R: Trip status
					B2	Reverse operation (R)

Comm.	Parameter	Scale	Unit	R/W	Assigned Content by Bit	
					B1	Forward operation (F)
					B0	Stop (S)
0h0007	Acceleration time	0.1	sec	R/W	-	
0h0008	Deceleration time	0.1	sec	R/W	-	
0h0009	Output current	0.1	A	R	-	
0h000A	Output frequency	0.01	Hz	R	-	
0h000B	Output voltage	1	V	R	-	
0h000C	DC link voltage	1	V	R	-	
0h000D	Output power	0.1	kW	R	-	
0h000E	Operation status	-	-		B15	0: HAND, 1:AUTO
					B14	1: Frequency command source by communication (built-in, option)
					B13	1: Operation command source by communication (built-in, option)
					B12	Reverse operation command
					B11	Forward operation command
					B10	Reserved
					B9	Jog mode
					B8	Drive stopping
					B7	DC Braking
					B6	Speed reached
					B5	Decelerating
					B4	Accelerating
					B3	Fault Trip - operates according to OUT-30 setting
					B2	Operating in reverse direction
					B1	Operating in forward direction
					B0	Stopped
0h000F	Fault trip information	-	-	R	B15	Reserved
					B14	Reserved
					B13	Reserved
					B12	Reserved
					B11	Reserved

Comm.	Parameter	Scale	Unit	R/W	Assigned Content by Bit	
					B10	H/W-Diag
					B9	Reserved
					B8	Reserved
					B7	Reserved
					B6	Reserved
					B5	Reserved
					B4	Reserved
					B3	Level Type trip
					B2	Reserved
					B1	Reserved
					B0	Latch Type trip
0h0010	Input terminal information	-	-	R	B15–B7	Reserved
					B6	P7
					B5	P6
					B4	P5
					B3	P4
					B2	P3
					B1	P2
					B0	P1
0h0011	Output terminal information	-	-	R	B15	Reserved
					B14	Reserved
					B13	Reserved
					B12	Reserved
					B11	Reserved
					B10	Q1
					B9	Reserved
					B8	Reserved
					B7	Reserved
					B6	Reserved
					B5	Reserved
					B4	Relay 5
					B3	Relay 4
					B2	Relay 3
					B1	Relay 2
					B0	Relay 1

Comm.	Parameter	Scale	Unit	R/W	Assigned Content by Bit
oh0012	V1	0.1	%	R	V1 input voltage
oh0013	Thermal	0.1	%	R	Input Thermal
oh0014	V	0.1	%	R	V2 input voltage
oh0015	I2	0.1	%	R	I2 input Current
oh0016	Motor rotation speed	1	Rpm	R	Displays existing motor rotation speed
oh0017 –oh0019	Reserved	-	-	-	-
oh001A	Select Hz/rpm	-	-	R	0: Hz unit, 1: rpm unit
oh001B	Display the number of poles for the selected motor	-	-	R	Display the number of poles for the selected motor

İzleme Adresleri

Comm. Address	Parameter	Scale	Unit	Assigned content by bit
oh0300	Inverter model	-	-	H100: 000Fh
oh0301	Inverter capacity	-	-	5.5kW: 4055h, 7.5kW: 4075h 11kW: 40Boh, 15kW: 40Foh 18.5kW: 4125h, 22kW: 4160h 30kW : 41Eoh, 37kW : 4250h, 45kW : 42Doh,55kW : 4370h, 75kW : 44Boh,90kW : 45Aoh,
oh0302	Inverter input voltage/power (Single phase, 3-phase)/cooling method	-	-	200 V 3-phase forced cooling: 0231h 400 V 3-phase forced cooling: 0431h
oh0303	Inverter S/W version	-	-	(ex) oh0064: Version 1.00 oh0065: Version 1.01
oh0304	Reserved	-	-	-

Comm. Address	Parameter	Scale	Unit	Assigned content by bit	
0h0305	Inverter operation state	-	-	B15	0: Normal state 4: Warning occurred 8: Fault occurred
				B14	
				B13	
				B12	
				B11–	-
				B8	
				B7	1: Speed searching 2: Accelerating 3: Operating at constant rate 4: Decelerating 5: Decelerating to stop 6: H/W OCS 7: S/W OCS 8: Dwell operating
				B6	
				B5	
				B4	
				B3	0: Stopped 1: Operating in forward direction 2: Operating in reverse direction 3: DC operating
				B2	
				B1	
				B0	
0h0306	Inverter operation frequency command source	-	-	B15	Operation command source 0: Keypad 1: Communication option 3: Built-in RS 485 4: Terminal block
				B14	
				B13	
				B12	
				B11	
				B10	
				B9	
				B8	
				B7	Frequency command source 0: Keypad speed 1: Keypad torque 2-4: Up/Down operation speed 5: V1, 7: V2, 8: I2 9: Pulse 10: Built-in RS 485 11: Communication option 13: Jog 14: PID
				B6	
				B5	
				B4	
				B3	
				B2	
				B1	
				B0	

Comm. Address	Parameter	Scale	Unit	Assigned content by bit	
					25-31: Multi-step speed frequency
oh0307	LCD keypad S/W version	-	-	(Ex.) oh0064: Version 1.00	
oh0308	LCD keypad title version	-	-	(Ex.) oh0065: Version 1.01	
oh0309	IO Board Version	-	-	(Ex.) oh0064: Version 1.00 (Ex.) oh0065: Version 1.01	
oh030A–oh30F	Reserved	-	-	-	
oh0310	Output current	0.1	A	-	
oh0311	Output frequency	0.01	Hz	-	
oh0312	Output rpm	0	Rpm	-	
oh0313	Reserved	-	-	-	
oh0314	Output voltage	1	V	-	
oh0315	DC Link voltage	1	V	-	
oh0316	Output power	0.1	kW	-	
oh0317	Reserved	-	-	-	
oh0318	PID reference	0.1	%	PID reference value	
oh0319	PID feedback	0.1	%	PID feedback value	
oh031A	Display the number of poles for the 1st motor	-	-	Displays the number of poles for the first motor	
oh031B	Display the number of poles for the 2nd motor	-	-	Displays the number of poles for the 2nd motor	
oh031C	Display the number of poles for the selected motor	-	-	Displays the number of poles for the selected motor	
oh031D	Select Hz/rpm	-	-	0: Hz, 1: rpm	
oh031E –oh031F	Reserved	-	-	-	
oh0320	Digital input information			B15–B7	Reserved
				B6	P7(I/O board)
				B5	P6(I/O board)
				B4	P5(I/O board)
				B3	P4(I/O board)
				B2	P3(I/O board)
				B1	P2(I/O board)
				B0	P1(I/O board)
oh0321	Digital output information	-	-	B15–	Reserved

Comm. Address	Parameter	Scale	Unit	Assigned content by bit	
				B11	
				B10	Q1
				B9–B5	Reserved
				B4	Relay 5
				B3	Relay 4
				B2	Relay 3
				B1	Relay 2
				B0	Relay 1
0h0322	Virtual digital input information	-	-	B15–B8	Reserved
				B7	Virtual DI 8(COM-77)
				B6	Virtual DI 7(COM-76)
				B5	Virtual DI 6(COM-75)
				B4	Virtual DI 5(COM-74)
				B3	Virtual DI 4(COM-73)
				B2	Virtual DI 3(COM-72)
				B1	Virtual DI 2(COM-71)
				B0	Virtual DI 1(COM-70)
0h0323	Display the selected motor	-	-	0: 1st motor/1: 2nd motor	
0h0324	AI1	0.01	%	Analog input V1 or Thermal(I/O board)	
0h0325	AI2	0.01	%	Analog input V2 or I2(I/O board)	
0h0326	Reserved	-	-	Reserved	
0h0327	Reserved	-	-	Reserved	
0h0328	AO1	0.01	%	Analog output 1(I/O board)	
0h0329	AO2	0.01	%	Analog output 2(I/O board)	
0h032A	Reserved	0.01	%	Reserved	
0h032B	Reserved	0.01	%	Reserved	
0h032C	Reserved	-	-	Reserved	
0h032D	Reserved	-	-	Reserved	
0h032E	Consumption energy (kWh)	0.1	kWh	Consumption energy (kWh)	
0h032F	Consumption energy (MWh)	1	MWh	Consumption energy (MWh)	
0h0330	Latch type trip information - 1	-	-	B15	PC Repeat Err
				B14	Over Heat Trip

Comm. Address	Parameter	Scale	Unit	Assigned content by bit	
				B13	Reserved
				B12	External Trip
				B11	Damper Err
				B10	Pipe Break
				B9	NTC Open
				B8	Reserved
				B7	Reserved
				B6	In Phase Open
				B5	Out Phase Open
				B4	Low Voltage2
				B3	E-Thermal
				B2	Inverter OLT
				B1	Under Load
				B0	Over Load
oh0331	Latch type trip information - 2	-	-	B15	Reserved
				B14	MMC Interlock
				B13	Reserved
				B12	Reserved
				B11	Reserved
				B10	Option Trip-1
				B9	No Motor Trip
				B8	Reserved
				B7	IO Board Trip
				B6	Reserved
				B5	ParaWrite Trip
				B4	TB Trip
				B3	Fan Trip
				B2	Thermal Trip
				B1	Level Detect
				B0	Reserved
oh0332	Level type trip information	-	-	B15–B4	Reserved
				B3	Lost Keypad
				B2	Lost Command

Comm. Address	Parameter	Scale	Unit	Assigned content by bit	
				B1	Low Voltage
				B0	BX
oh0333	H/W Diagnosis Trip information	-	-	B15–B3	Reserved
				B2	Watchdog-1 error
				B1	EEP Err
				B0	ADC Offset
oh0334	Warning information	-	-	B15	Reserved
				B14	Low Battery
				B13	Load Tune
				B12	Fan Exchange
				B11	CAP. Warning
				B10	Level Detect
				B9	Reserved
				B8	Lost Keypad
				B7	Pipe Break
				B6	Fire Mode
				B5	DB Warn %ED
				B4	Fan Warning
				B3	Lost Command
				B2	Inv Over Load
				B1	Under Load
				B0	Over Load
oh0335	Latch type trip information -3	-	-	B15	Reserved
				–	Reserved
				B4	Reserved
				B3	Overcurrent2 Trip
				B2	Overvoltage Trip
				B1	Overcurrent1 Trip
				B0	Ground Fault Trip
oh0336–oh0339	Reserved	-	-	Reserved	

Comm. Address	Parameter	Scale	Unit	Assigned content by bit
oh033A	Proc PID Output	0.01	%	Process PID Output (%)
oh033B	Proc PID UnitScale Ref	Proc Unit	Proc Unit	Unit Scaled Process PID reference value
oh033C	Proc PID UnitScale Fdb	Proc Unit	Proc Unit	Unit Scaled Process PID feedback value
oh0340	On Time date	0	Day	Total number of days the inverter has been powered on
oh0341	On Time Minute	0	Min	Total number of minutes excluding the total number of On Time days
oh0342	Run Time date	0	Day	Total number of days the inverter has driven the motor
oh0343	Run Time minute	0	Min	Total number of minutes excluding the total number of Run Time days
oh0344	Fan Time date	0	Day	Total number of days the heat sink fan has been running
oh0345	Fan Time minute	0	Min	Total number of minutes excluding the total number of Fan Time days
oh0346 –oh0348	Reserved	-	-	Reserved
oh0349	Reserved	-	-	-
oh034A	Option 1	-	-	0: None, 5 : LonWorks
oh034B	Reserved	-	-	Reserved
oh034C	Reserved			Reserved
oh034D– oh034F	Reserved	-	-	Reserved
oh0350	E-PID 1 Output	0.01	%	External PID 1 output
oh0351	E-PID 1 Ref	0.1	%	External PID 1 Reference
oh0352	E-PID 1 Fdb	0.1	%	External PID 1 feedback
oh0353	E-PID 1 Unit Scale Ref	Proc Unit	Proc Unit	Unit Scale External PID 1 Reference
oh0354	E-PID 1 Unit Scale Fdb	Proc Unit	Proc Unit	Unit Scale External PID 1 feedback
oh0355	Reserved	-	-	Reserved

Comm. Address	Parameter	Scale	Unit	Assigned content by bit	
oh0356	Reserved	-	-	Reserved	
oh0357	E-PID 2 Output	0.01	%	External PID 2 output	
oh0358	E-PID 2 Ref	0.1	%	External PID 2 Reference	
oh0359	E-PID 2 Fdb	0.1	%	External PID 2 feedback	
oh035A	E-PID 2 Unit Scale Ref	Proc Unit	Proc Unit	Unit Scale External PID 2 Reference	
oh035B	E-PID 2 Unit Scale Fdb	Proc Unit	Proc Unit	Unit Scale External PID 2 feedback	
oh035C	Applicaion Status	-	-	B15–B2	Reserved
				B1	Fire Mode
				B0	Pump Clean
oh035D	Inv Temperature	0	°C	Heatsink Temperature	
oh035E	Power Factor	0.1	-	Output power factor	
oh035F	Inv Fan Time	-	%	INV Fan running time(%)	
oh0360	Multi motor control terminal output	-	-	B15	Reserved
				–	Reserved
				B5	Reserved
				B4	5th motor running
				B3	4th motor running
				B2	3rd motor running
				B1	2nd motor running
				B0	1st motor running