SC-OPE II
Parameter Mapping
for Modbus RTU

The SC-OPE II can be configured to respond to Modbus RTU read and write requests through its Expansion Port.

Configuring the SC-OPE II for Modbus RTU

To set up the Expansion Port of the SC-OPE II for Modbus RTU, you can use either the SC-OPE II Configuration software or the Edit Menu on the SC-OPE II.

Expansion Port setup using the SC-OPE II Configuration Editor

1. Run the SC-OPE II Configuration Editor.
2. Connect the Expansion port on the SC-OPE II to the COM port on your PC.
3. Power the SC-OPE II (using either an external +5VDC supply, or by connecting it to the Inverter), and hold down the *MODE* key for 2-3 seconds until the message "Waiting for PC" appears on the top line of the SC-OPE II display.
4. Start a new project, open an existing project, or upload a project.
5. Select "Edit | Inverter Port Configuration" and select an Inverter type (CR100 or HS300 Series Inverter).
6. Select "Edit | Expansion Port Configuration" and select "Modbus RTU".
7. Set the Modbus address for the SC-OPE II, select RS232 or RS485, and set the other communications parameters to match your Modbus RTU host.
8. Save the project and download it ("Transfer | Download project") to the SC-OPE.

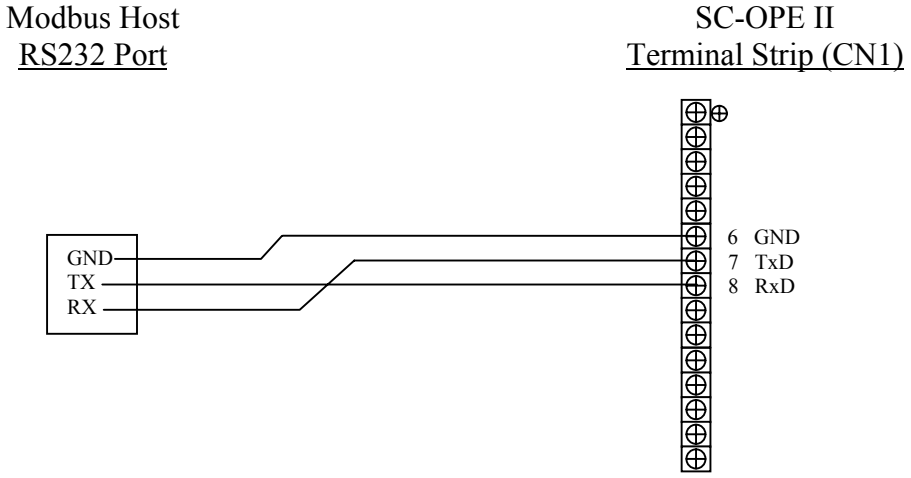
Expansion Port setup using the SC-OPE II Edit Menu

1. Power the SC-OPE II (using either an external +5VDC supply, or by connecting it to the Inverter), and hold down the *MODE* key for 2-3 seconds until the message "Waiting for PC" appears on the top line of the SC-OPE II display.
2. Press the *MODE* key again to select the EDIT MENU.
3. Press the down arrow until the 3rd line reads "Expansion Port Cfg", and press *STORE|ENTER*.
4. The 3rd line should now read "Expansion Protocol". Press *CHANGE DATA*, use the up and down arrows to select "Modbus RTU", and press *STORE|ENTER*.
5. Press the down arrow key again to select "Expansion Address". Use the procedure from step 4 to select a Modbus address.
6. Press the down arrow key again to select "Expansion Port Type". Use the procedure from step 4 to select either RS232 or RS485.
7. Continue this procedure for each communications parameter.
8. Press the *CANCEL* key to return to the EDIT MENU, and press the down arrow until the 3rd line reads "Store Configuration ". Press *STORE|ENTER* to store your new configuration.
9. Press the down arrow again until the 3rd line reads "Run Mode". Press *STORE|ENTER* to return to RUN mode.

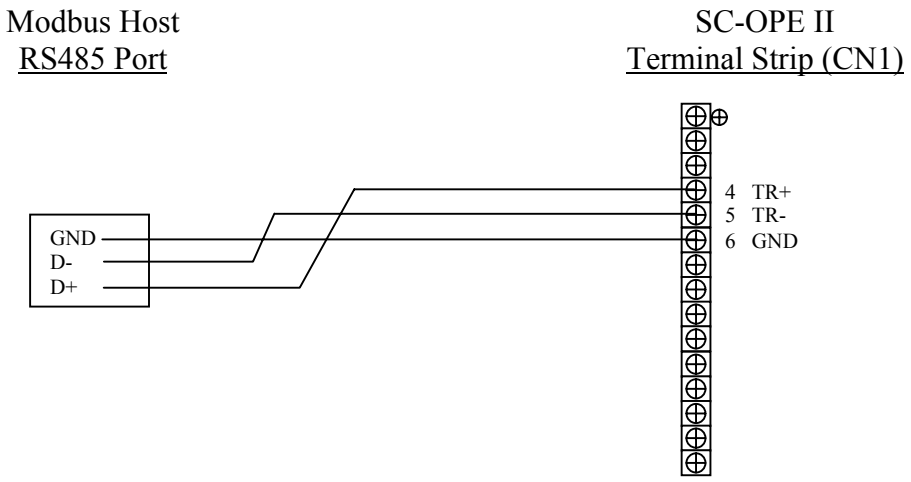
Connecting the SC-OPE II to the Modbus RTU Host

Before you can establish communications between the SC-OPE II and a Modbus RTU Host, you must select either RS232 or RS485 communications, and install a communications cable.

RS232 Communications
RS232 is used strictly for Point-to-Point communications, or to connect to an RS485 network through an RS232/RS485 Converter. The RS232 port on the SC-OPE II uses pins 6, 7 and 8 on the Terminal Strip (CN1) on the back of the unit. You will need to locate the Modbus RS232 port on your host unit. Your cable should make the following connections:



RS485 Communications
RS485 is used for multidrop communications. The RS485 port on the SC-OPE II uses pins 4, 5 and 6 on the Terminal Strip (CN1) on the back of the unit. You will need to locate the Modbus RS485 port on your host unit. Your cable should make the following connections:



Modbus RTU Register Mapping

Inverter parameters are mapped to 4xxxx registers in Modbus RTU. To read or write parameters, simply read or write the corresponding registers.

HS300 Series Inverter

Register	Description
40001	Run Command (code) (0:stop, 1:fwd, 2:rev) – *Write Only*
40002	[f02] Setting Frequency, 1st function (*100) (0.00-400.00 Hz)
40003	[f06] Acceleration Time 1, 1st function (*10) (0.0-3000.0 s)
40004	[f07] Deceleration Time 1, 1st function (*10) (0.0-3000.0 s)
40005	[a06] Frequency Low Limiter (*10) (0.0-400.0 Hz)
40006	[a05] Frequency High Limiter (*10) (0.0-400.0 Hz)
40007	[a07] Jump Frequency 1 (*10) (0.0-400.0 Hz)
40008	[a08] Jump Frequency 2 (*10) (0.0-400.0 Hz)
40009	[a09] Jump Frequency 3 (*10) (0.0-400.0 Hz)
40010	[a62] Base Frequency, 1st function (30-400 Hz)
40011	[a63] Maximum Frequency, 1st function (30-400 Hz)
40012	DC Braking Frequency (*10) (0.0-400.0 Hz)
40013	Stop Frequency (*10) (0.0-400.0 Hz)
40014	[a61] Jogging Frequency (*100) (0.10-9.99 Hz)
40015	[a04] Start Frequency (*100) (0.10-9.99 Hz)
40016	[a01] Motor Capacity, 1st function (code) (5:3.7 kW, 6:5.5 kW, 7:7.5 kW, 8:11 kW, 9:15 kW, 10:18.5 kW, 11:22 kW, 12:30 kW, 13:37 kW, 14:45 kW, 15:55 kW, 16:75 kW, 17:90 kW, 18:110 kW, 19:132 kW, 20:160 kW, 21:220 kW, 22:260 kW)
40017	IPS Wait time (*10) (0.3-100.0 s)
40018	Frequency Multiplier (scaling) (*10) (0.0-99.9)
40019	[a39] Target Acceleration Frequency (*10) (0.0-400.0 Hz)
40020	[a40] Target Deceleration Frequency (*10) (0.0-400.0 Hz)
40021	DC Braking Time at Start (*10) (0.0-600.0 s)
40022	DC Braking Time at Stop (*10) (0.0-600.0 s)
40023	DC Braking Output Shutoff Time (*100) (0.00-5.00 s)
40024	Frequency Stop Time (*10) (0.0-60.0 s)
40025	[a38] Regenerative Braking Ratio (*10) (0.0-100.0 %)
40026	Overload Limitation Constant (*10) (0.3-30.0)
40027	Primary Resistance R1, 1st function (*1000) (0.000-65.535 Ohm)
40028	Secondary Resistance R2, 1st function (*1000) (0.000-65.535 Ohm)
40029	Combined Inductance L1+L2, 1st function (*100) (0.00-655.35 mH)
40030	Mutual Inductance M, 1st function (*100) (0.00-655.35 mH)
40031	Inertia J, 1st function (*100) (0.00-655.35 kgm^2)
40032	[a03] ASR Kp, 1st function (*100) (0.00-100.00)
40033	ASR Ti, 1st function (0-10000 ms)

Register	Description
40034	ASR Kpp, 1st function (*100) (0.00-100.00)
40035	Number of Motor Poles for display (code) (0:2P, 1:4P, 2:6P, 3:8P, 4:10P, 5:12P, 6:14P, 7:16P, 8:18P, 9:20P, 10:24P, 11:32P, 12:36P, 13:48P)
40036	Width of Jump Frequency (*10) (0.0-9.9 Hz)
40037	[a01] Motor Capacity, Europe, 1st function (code) (8:4 kW, 9:5.5 kW, 10:7.5 kW, 11:11 kW, 12:15 kW, 13:18.5 kW, 14:22 kW, 15:30 kW, 16:37 kW, 17:45 kW, 18:55 kW, 19:75 kW, 20:90 kW, 21:110 kW, 22:132 kW, 23:160 kW, 24:220 kW, 25:260 kW)
40038	[f08] Manual Torque Boost (0-99)
40039	V-gain Set value (20-100 %)
40040	[a24] Selection of Electronic Thermal Characteristics, 1st function (code) (0:Constant Torque, 1:Reduced Torque, 2:Any Torque
40041	[a23] Electronic Thermal Level, 1st function (20-120 %)
40042	Overload Limitation Level (50-150 %)
40043	Permissible Momentary Power Failure Time (*10) (0.3-25.0 s)
40044	Acceleration Curve Pattern (code) (0:Linear, 1:S-shaped, 2:U-shaped, 3:Reverse U-shaped)
40045	Deceleration Curve Pattern (code) (0:Linear, 1:S-shaped, 2:U-shaped, 3:Reverse U-shaped)
40046	Curve Constant (01-10)
40047	DC Braking Force at Start (00-20)
40048	DC Braking Force at Stop (00-20)
40049	Parameter Setting Method (code) (0:Operator, 1:Option 1, 2:Option 2)
40050	[f09] Operation Commanding Method (code) (0:Terminal, 1:Operator, 2:Option 1, 3:Option 2)
40051	[f09] Frequency Commanding Method (code) (0:Terminal, 1:Operator, 2:Option 1, 3:Option 2)
40052	[c00] Intelligent Pin Input 1 (code) (0:REV, 1:CF1, 2:CF2, 3:CF3, 5:JG, 6:DB, 7:STN, 8:SET, 9:CH1, 11:FRS, 12:EXT, 13:USP, 14:CS, 15:SFT, 16:AT, 18:RS, 19:PR1, 20:PR2, 21:PR3, 22:PR4, 23:PR5, 24:PR6, 25:PR7, 26:PR8, 27:UP, 28:DOWN)
40053	[c01] Intelligent Pin Input 2 (“)
40054	[c02] Intelligent Pin Input 3 (“)
40055	[c03] Intelligent Pin Input 4 (“)
40056	[c04] Intelligent Pin Input 5 (“)
40057	[c05] Intelligent Pin Input 6 (“)
40058	[c06] Intelligent Pin Input 7 (“)
40059	[c07] Intelligent Pin Input 8 (“)
40060	[c10] Intelligent Pin Output 11 (code) (0:FA, 1:RUN, 2:OTQ)
40061	[c11] Intelligent Pin Output 12 (“)
40062	[c20] Intelligent Pin Input NO/NC (bit 0-3: NO/NC for Inputs 1-4) (0:NO, 1:NC)
40063	[c21] Intelligent Pin Output NO/NC (bits 0-1: NO/NC for Outputs 11-12, bit 2:NO/NC for Alarm Output) (0:NO, 1:NC)

Register	Description
40064	Analog Input Ratio – Start (0-100 %)
40065	Analog Input Ratio – End (0-100 %)
40066	Reverse Torque Limit (0-150 %)
40067	Forward Torque Limit (0-150 %)
40068	Software Switch 1 - bit 0:DCB Enable (1:enabled) bit 2:[f04] Direction Setting (0:fwd, 1:rev) bit 3:Overload Limiting during Acceleration (1:on) bit 6:IPS Tripping (1:disabled) bit 7:STOP Key Enable (1:enabled)
40069	Software Switch 2 - bit 0:DCB Type (0:edge, 1:level) bit 1:Speed Select (0:Multistage speed, 1:Process Advance) bit 4:Option R0-T0 (1:on) bit 6:[a48] Analog Input Voltage (0:5V, 1:10V)
40070	Software Switch 3 - bit 0:[a54] Auto Tune, 1st Function (0:Normal, 1:Auto) bit 1:[a54] Motor Constant Data, 1st Function (0:Normal, 1:Auto) bit 2:[a54] Operation after FRS (0:FST, 1:ZST) bit 3:Gear Setting Position (0:FB, 1:RET) bit 5:Orienting Stop Position Change (0:IN, 1:OUT) bit 6:Orienting Direction (0:FWD, 1:REV)
40071	Software Switch 4 - bit 0:Trip History Mode (0:CNT, 1:CLR) bit 1:Debug Mode (1:ON) bit 3:PID Switching (0:IN, 1:OUT) bit 4:Feedback (0:AC, 1:DC) bit 5:OP1 Error Operation (0:RUN, 1:STP) bit 6:OP2 Error Operation (0:RUN, 1:STP)
40072	Software Switch 5 - bit 1:Reverse Run Prevention (1:ON) bit 2:AVR during Decel (1:ON) bit 3:[a24] E-Thermal Characteristics, 2nd function (0:CRT, 1:SUB) bit 5: [a54] Auto Tune, 2nd Function (0:Normal, 1:Auto) bit 6: [a54] Motor Constant Data, 2nd Function (0:Normal, 1:Auto)
40073	Software Switch 6 - bit 0:COMM Data Bits (0:7, 1:8) bit 1:COMM Parity (1:Enabled) bit 2:COMM Parity (0:Even, 1:Odd) bit 3:COMM Stop Bits (0:1, 1:2) bit 4:COMM Test Mode (1:ON)
40074	Software Lock (code) (0:MD0, 1:MD1, 2:MD2, 3:MD3)
40075	[a10] Carrier Frequency (*10) (2.0-16.0 kHz)
40076	[f11] Input Voltage Setting (code) (0:200 V, 1:215 V, 2:220 V, 3:230 V, 4:380 V, 5:400 V, 6:415 V, 7:440 V, 8:460 V)
40077	[a00] Control Method, 1st function (code) (0:VC, 1:VP1, 2:VP2, 3:VP3, 4:SLV, 5:V2)
40078	Maximum Frequency Change-over (code) (0:120 Hz, 1:400 Hz)
40079	[a44] Monitor (code) (0:A-F, 1:A, 2:T, 3:D-F)

Register	Description
40080	[a49] Frequency Arrival Signal Output Pattern (code) (0:CST, 1:PAT, 2:ANY)
40081	Selection of Rotational Direction (code) (0:forward only, 1:reverse only, 2:both)
40082	[a34] Restart Operation after Momentary Power Failure (code) (0:ALM, 1:FTP, 2:RST, 3:ZST)
40083	[a02] Number of Motor Poles, 1st function (code) (0:2P, 1:4P, 2:6P, 3:8P)
40084	[f02] Operator Set Frequency, 2nd function (*100) (0.00-400.00 Hz)
40085	Process Advance Setting 1 (*100) (0.00-400.00 Hz)
40086	Process Advance Setting 2 (*100) (0.00-400.00 Hz)
40087	Process Advance Setting 3 (*100) (0.00-400.00 Hz)
40088	Process Advance Setting 4 (*100) (0.00-400.00 Hz)
40089	Process Advance Setting 5 (*100) (0.00-400.00 Hz)
40090	Process Advance Setting 6 (*100) (0.00-400.00 Hz)
40091	Process Advance Setting 7 (*100) (0.00-400.00 Hz)
40092	Process Advance Setting 8 (*100) (0.00-400.00 Hz)
40093	[a12,f02] Multistage Speed Setting 1 (*100) (0.00-400.00 Hz)
40094	[a13,f02] Multistage Speed Setting 2 (*100) (0.00-400.00 Hz)
40095	[a14,f02] Multistage Speed Setting 3 (*100) (0.00-400.00 Hz)
40096	[f02] Multistage Speed Setting 4 (*100) (0.00-400.00 Hz)
40097	[f02] Multistage Speed Setting 5 (*100) (0.00-400.00 Hz)
40098	[f02] Multistage Speed Setting 6 (*100) (0.00-400.00 Hz)
40099	[f02] Multistage Speed Setting 7 (*100) (0.00-400.00 Hz)
40100	[f06] Acceleration Time 1, 2nd function (*10) (0.0-3000.0 s)
40101	[f07] Deceleration Time 1, 2nd function (*10) (0.0-3000.0 s)
40102	[f06] Acceleration Time 2 (*10) (0.0-3000.0 s)
40103	[f07] Deceleration Time 2 (*10) (0.0-3000.0 s)
40104	[f05] Digital Operator V/F Pattern, 1st function (code) (0:VC/50/50, 1:VC/50/100, 2:VC/60/60, 3:VC/60/120, 4:VP1/50/50, 5:VP1/60/60)
40105	[f05] Digital Operator V/F Pattern, 2nd function (code) (0:VC/50/50, 1:VC/50/100, 2:VC/60/60, 3:VC/60/120, 4:VP1/50/50, 5:VP1/60/60)
40106	[a54] Digital Operation Software Switch, 1st function
40107	[a54] Digital Operation Software Switch, 2nd function
40108	[a26] Externally Set Start Frequency (*10) (0.0-400.0 Hz)
40109	[a27] Externally Set End Frequency (*10) (0.0-400.0 Hz)
40110	Process Advance Time 1 (*10) (0.0-6000.0 s)
40111	Process Advance Time 2 (*10) (0.0-6000.0 s)
40112	Process Advance Time 3 (*10) (0.0-6000.0 s)
40113	Process Advance Time 4 (*10) (0.0-6000.0 s)
40114	Process Advance Time 5 (*10) (0.0-6000.0 s)
40115	Process Advance Time 6 (*10) (0.0-6000.0 s)
40116	Process Advance Time 7 (*10) (0.0-6000.0 s)
40117	Process Advance Time 8 (*10) (0.0-6000.0 s)
40118	Number of Encoder Pulses (255-65535 pulses)

Register	Description
40119	Orientation End Delay Time (*100) (0.00-9.99 s)
40120	Orientation End Range (0-10000 pulses)
40121	Orientation Speed (*10) (0.0-400.0 Hz)
40122	Orientation Stop Position (0-4095 pulses)
40123	Feed Forward Gain (*100) (0.00-655.35)
40124	Electronic Gear Ration – Numerator (1-9999)
40125	Electronic Gear Ration – Denominator (1-9999)
40126	Positional Loop Gain (*100) (0.00-100.00 rad/s)
40127	Target PID Value (*100) (0.00-200.00 %)
40128	PID D Gain (*10) (0.0-100.0)
40129	COMM Baud Rate (code) (0:300 bps, 1:600 bps, 2:1200 bps, 3:2400 bps, 4:4800 bps, 5:9600 bps, 6:19200 bps)
40130	Electronic Thermal Frequency 1 (0-400 Hz)
40131	Electronic Thermal Frequency 2 (0-400 Hz)
40132	Electronic Thermal Frequency 3 (0-400 Hz)
40133	[a62] Base Frequency, 2^{nd} function (30-400 Hz)
40134	[a63] Maximum Frequency, 2^{nd} function (30-400 Hz)
40135	[a01] Motor Capacity, 2^{nd} function (code) (5:3.7 kW, 6:5.5 kW, 7:7.5 kW, 8:11 kW, 9:15 kW, 10:18.5 kW, 11:22 kW, 12:30 kW, 13:37 kW, 14:45 kW, 15:55 kW, 16:75 kW, 17:90 kW, 18:110 kW, 19:132 kW, 20:160 kW, 21:220 kW, 22:260 kW)
40136	[a01] Motor Capacity, Europe, 2^{nd} function (code) (8:4 kW, 9:5.5 kW, 10:7.5 kW, 11:11 kW, 12:15 kW, 13:18.5 kW, 14:22 kW, 15:30 kW, 16:37 kW, 17:45 kW, 18:55 kW, 19:75 kW, 20:90 kW, 21:110 kW, 22:132 kW, 23:160 kW, 24:220 kW, 25:260 kW)
40137	Primary Resistance R1, 2^{nd} function (*1000) (0.000-65.535 Ohm)
40138	Secondary Resistance R2, 2^{nd} function (*1000) (0.000-65.535 Ohm)
40139	Combined Inductance L1+L2, 2^{nd} function (*100) (0.00-655.35 mH)
40140	Mutual Inductance M, 2^{nd} function (*100) (0.00-655.35 mH)
40141	Inertia J, 2^{nd} function (*100) (0.00-655.35 kgm^2)
40142	[a03] ASR Kp, 2^{nd} function (*100) (0.00-100.00)
40143	ASR Ti, 2^{nd} function (0-10000 ms)
40144	ASR Kpp, 2^{nd} function (*100) (0.00-100.00)
40145	Electronic Thermal Current 1 (*10) (0.0-600.0 A)
40146	Electronic Thermal Current 2 (*10) (0.0-600.0 A)
40147	Electronic Thermal Current 3 (*10) (0.0-600.0 A)
40148	[f09] DOP Operation/Frequency Commanding (code) (0:OPE/OPE, 1:OPE/TRM, 2:TRM/OPE, 3:TRM/TRM, 4:OPE/OP1, 5:OP1/OPE, 6:OP1/OP1, 7:OPE/OP2, 8:OP2/OPE, 9:OP2/OP2, 10:TRM/OP1, 11:OP1/TRM, 12:TRM/OP2, 13:OP2/TRM, 14:OP1/OP2, 15:OP2/OP1)
40149	Over-torque Signal Regeneration Preset Torque (0-250 %)
40150	Over-torque Signal Power Setting Torque (0-250 %)

Register	Description
40151	Process Advance Terminal Frequency Enable – bit 0:PRC 1 Terminal Freq (1:enabled) … bit 7: PRC 8 Terminal Freq (1:enabled)
40152	Process Advance 1 Changeover (0-8)
40153	Process Advance 2 Changeover (0-8)
40154	Process Advance 3 Changeover (0-8)
40155	Process Advance 4 Changeover (0-8)
40156	Process Advance 5 Changeover (0-8)
40157	Process Advance 6 Changeover (0-8)
40158	Process Advance 7 Changeover (0-8)
40159	Process Advance 8 Changeover (0-8)
40160	Process Advance 1 Sequence (0-8)
40161	Process Advance 2 Sequence (0-8)
40162	Process Advance 3 Sequence (0-8)
40163	Process Advance 4 Sequence (0-8)
40164	Process Advance 5 Sequence (0-8)
40165	Process Advance 6 Sequence (0-8)
40166	Process Advance 7 Sequence (0-8)
40167	Process Advance 8 Sequence (0-8)
40168	Process Advance 1 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40169	Process Advance 2 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40170	Process Advance 3 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40171	Process Advance 4 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40172	Process Advance 5 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40173	Process Advance 6 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40174	Process Advance 7 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40175	Process Advance 8 Run Mode (code) (0:Acc1/Dec1/Fwd, 1:Acc1/Dec1/Rev, 2:Acc2/Dec2/Fwd, 3:Acc2/Dec2/Rev, 4:Free Run Stop)
40176	[a59] Operation Mode (code) (0:Normal, 1:Energy-save, 2:GOD)
40177	[f08] Manual Torque Boost, 2nd function (00-99)
40178	Torque Limiter (code) (0:OPE, 1:OP1, 2:OP2)
40179	[a23] Electronic Thermal Level, 2nd function (0-120 %)
40180	[a02] Number of Motor Poles, 2nd function (code) (0:2P, 1:4P, 2:6P, 3:8P)
40181	[a00] Control Method, 2nd function (code) (0:VC, 1:VP1, 2:VP2, 3:VP3, 4:SLV, 5:V2)
40182	Option Control Mode (code) (0:ASR, 1:APR, 2:ATR)
40183	PID P Gain (*10) (0.0-5.0)

Register	Description
40184	PID I Gain (*10) (0.0-15.0)
40185	COMM Station Number (01-32)
40186	Option Thermal Notice Signal Level (0-100 %)
40187	Digital Input Terminal Mode (0-9:MD0-MD9)
40188	Digital Output Terminal Mode (0-9:MD0-MD9)
40189	Analog Input Terminal Mode (0-9:MD0-MD9)
40190	Analog Output Terminal Mode (0-9:MD0-MD9)
40191	[f10] Analog Meter Correction Coefficient (0-100)
40192	Status 1 – *Read Only* bit 0:Stopped bit 1:Running bit 2:Tripping
40193	Status 2 – *Read Only* bit 0:Free Running bit 1:Normal Stop bit 2:Accelerating bit 3:Decelerating bit 4:Constant Speed bit 5:Retry bit 6:Restart bit 7:DC Braking
40194	Status 3 – *Read Only* bit 0:BRD Running bit 1:Servo Locking bit 2:Process Inching bit 3:Jogging bit 4:Reversing bit 5:Orienting
40195	Selection of 1st/2nd function (0:1st, 1:2nd) – *Read Only*
40196	Operator Set Frequency, 1st function (*100) (0.00-400.00 Hz) – *Read Only*
40197	Operator Set Frequency, 2nd function (*100) (0.00-400.00 Hz) – *Read Only*
40198	Terminal Set Frequency (*1000) (0.000-400.000 Hz) – *Read Only*
40199	Option 1 Set Frequency (*1000) (0.000-400.000 Hz) – *Read Only*
40200	Option 2 Set Frequency (*1000) (0.000-400.000 Hz) – *Read Only*
40201	[f02] Preset Frequency (*1000) (0.000-400.000 Hz) – *Read Only*
40202	[d00] Current Frequency (*1000) (0.000-400.000 Hz) – *Read Only*
40203	Current Rotation Direction (code) (00h:stop, 40h:forward, 80h:reverse) – *Read Only*
40204	[d01] Current Rotation Speed (0-65535 RPM) – *Read Only*
40205	[d02] Inverter Output Current (*10) (0.0-6553.5 A) – *Read Only*
40206	Ratio of Output Current to Rated Current (*10) (0.0-300.0 %) – *Read Only*
40207	Inverter Output Torque (-200-+300 %) – *Read Only*
40208	P-N Voltage (*10) (0.0-1000.0 V) – *Read Only*

Register	Description
40209	Input Terminal Information 1 – *Read Only* bit 0:REV bit 1:CF1 bit 2:CF2 bit 3:CF3 bit 5:JG bit 6:DB bit 7:STN
40210	Input Terminal Information 2 – *Read Only* bit 0:SET bit 1:CH1 bit 3:FRS bit 4:EXT bit 5:USP bit 6:CS bit 7:SFT
40211	Input Terminal Information 3 – *Read Only* bit 0:AT bit 2:RS bit 3:PR1 bit 4:PR2 bit 5:PR3 bit 6:PR4 bit 7:PR5
40212	Input Terminal Information 4 – *Read Only* bit 0:PR6 bit 1:PR7 bit 2:PR8 bit 3:UP bit 4:DWN
40213	Output Terminal Information – *Read Only* bit 0:FA1 bit 1:RUN bit 2:OTQ
40214	Warning Monitor, 1st function – *Read Only*
40215	Warning Monitor, 2nd function – *Read Only*
40216	Tripping Frequency 1 (*10) (0.0-400.0 Hz) – *Read Only*
40217	Tripping Frequency 2 (*10) (0.0-400.0 Hz) – *Read Only*
40218	Tripping Frequency 3 (*10) (0.0-400.0 Hz) – *Read Only*
40219	[d10] Tripping Current 1 (*10) (0.0-6553.5 A) – *Read Only*
40220	Tripping Current 2 (*10) (0.0-6553.5 A) – *Read Only*
40221	Tripping Current 3 (*10) (0.0-6553.5 A) – *Read Only*
40222	[d10] Tripping Voltage 1 (*10) (0.0-1000.0 V) – *Read Only*
40223	Tripping Voltage 2 (*10) (0.0-1000.0 V) – *Read Only*
40224	Tripping Voltage 3 (*10) (0.0-1000.0 V) – *Read Only*
40225	Tripping Run Time 1 (0-49708 days) – *Read Only*
40226	Tripping Run Time 2 (0-49708 days) – *Read Only*
40227	Tripping Run Time 3 (0-49708 days) – *Read Only*
40228	[d10] Tripping Factor 1 – *Read Only*

Register	Description
40229	[d11] Tripping Factor 2 – *Read Only*
40230	[d11] Tripping Factor 3 – *Read Only*
40231	Total Number of Trips (0-255 times) – *Read Only*
40232	Current Trip Factor – *Read Only*
40233	Service Time (0-4294836225 s) – *Read Only*
40234	Country Code (code) (0:Japan, 1:Europe, 2:USA) – *Read Only*
40235	Inverter Model Code (code) (6:055, 7:075, 8:110, 9:150, 11:220, 12:300, 13:370, 14:450, 15:550, 16:750, 17:900, 18:1100, 19:1320, 20:1600, 21:2200) – *Read Only*
40236	Voltage Class Code (code) (0:200 V, 1:400 V) – *Read Only*
40237	Scaled Frequency (*10000) – *Read Only*
40238	Input Voltage (*10) (V) – *Read Only*
40239	Instantaneous Power (*100) (kW) – *Read Only*
40240	kW Hours (*10) (kWH) – *Read Only*
40241	Ratio of Power to Rated Power (*10) (%) – *Read Only*
40242	Terminal Status – *Read Only* bit 0:Input Terminal 1 bit 1:Input Terminal 2 bit 2:Input Terminal 3 bit 3:Input Terminal 4 bit 4:Input Terminal 5 bit 5:Input Terminal 6 bit 6:Input Terminal 7 bit 7:Input Terminal 8 bit 8:FW Terminal

CR100 Series Inverter

Register	Description
40001	Run Command (code) (0:stop, 1:fwd, 2:rev) – *Write Only*
40002	Inverter Capacity (code) (0:0.2 kW, 1:0.4 kW, 2:0.55/0.75 kW, 3:1.1/1.5 kW, 4:2.2 kW, 5:3.0/3.7/4.0 kW)
40003	[a43] Boost Frequency (*10) (0.0-50.0 %)
40004	[b03] Waiting Time at Retry Set (*10) (0.3-100.0 s)
40005	[a41] Boost Method (code) (0:manual, 1:automatic)
40006	[a42] Torque Boost Adjustment (00-99)
40007	[b83] Carrier Frequency (*10) (0.5-16.0 kHz)
40008	[a82] Motor Input Voltage Set (180-250)
40009	[a44] Torque Characteristics (code) (0:VC, 1:VP)
40010	[a45] V-gain Adjustment (50-100 %)
40011	[b01] Mode of Retry (code) (0:ALM, 1:ZST, 2:RST, 3:FTP)
40012	[b22] Overload Restriction Level (20-200 %)
40013	[b02] Allowed IPF Time (*10) (0.3-25.0 s)
40014	[a81] AVR Function Selection (code) (0:ON, 1:OFF, 2:DOFF)
40015	[b21] Overload Restriction Operation Mode (code) (0:ON, 1:OFF, 2:CRT)
40016	[b32] No-load Motor Current Setting (0-100 %)
40017	[b23] Overload Restriction Constant (*10) (0.1-30.0 s/Hz)
40018	[a21] Multistage Speed 1 (*100) (0.00-360.00 Hz)
40019	[a22] Multistage Speed 2 (*100) (0.00-360.00 Hz)
40020	[a23] Multistage Speed 3 (*100) (0.00-360.00 Hz)
40021	[a24] Multistage Speed 4 (*100) (0.00-360.00 Hz)
40022	[a25] Multistage Speed 5 (*100) (0.00-360.00 Hz)
40023	[a26] Multistage Speed 6 (*100) (0.00-360.00 Hz)
40024	[a27] Multistage Speed 7 (*100) (0.00-360.00 Hz)
40025	[a28] Multistage Speed 8 (*100) (0.00-360.00 Hz)
40026	[a29] Multistage Speed 9 (*100) (0.00-360.00 Hz)
40027	[a30] Multistage Speed 10 (*100) (0.00-360.00 Hz)
40028	[a31] Multistage Speed 11 (*100) (0.00-360.00 Hz)
40029	[a32] Multistage Speed 12 (*100) (0.00-360.00 Hz)
40030	[a33] Multistage Speed 13 (*100) (0.00-360.00 Hz)
40031	[a34] Multistage Speed 14 (*100) (0.00-360.00 Hz)
40032	[a35] Multistage Speed 15 (*100) (0.00-360.00 Hz)
40033	[a73] PID I Gain (*10) (0.0-150.0 s)
40034	[a74] PID D Gain (*10) (0.0-100.0)
40035	[a38] Jogging Frequency (*100) (0.00-9.99 Hz)
40036	[b86] Frequency Converting Coefficient (*10) (0.0-99.9)
40037	[f02] Acceleration Time 1 (*10) (0.0-3000.0 s)
40038	[f03] Deceleration Time 1 (*10) (0.0-3000.0 s)
40039	[a92] Acceleration Time 2 (*10) (0.0-3000.0 s)
40040	[a93] Deceleration Time 2 (*10) (0.0-3000.0 s)
40041	[a95] Acceleration Change Frequency (*100) (0.00-360.00 Hz)

Register	Description
40042	[a96] Deceleration Change Frequency (*100) (0.00-360.00 Hz)
40043	[f01,a20] Output Frequency Setting (*100) (0.00-360.00 Hz)
40044	[a61] Frequency Upper Limiter (*100) (0.00-360.00 Hz)
40045	[a62] Frequency Lower Limiter (*100) (0.00-360.00 Hz)
40046	[a52] DC Braking Frequency (*100) (0.00-10.00 Hz)
40047	[a55] DC Braking Time (*10) (0.0-60.0 s)
40048	[a63] Jump Frequency 1 (*100) (0.00-360.00 Hz)
40049	[a65] Jump Frequency 2 (*100) (0.00-360.00 Hz)
40050	[a67] Jump Frequency 3 (*100) (0.00-360.00 Hz)
40051	[c42] Arrival Frequency Rate Acceleration (*100) (0.00-360.00 Hz)
40052	[c43] Arrival Frequency Rate Deceleration (*100) (0.00-360.00 Hz)
40053	[c44] Level of Deviation Signal (*100) (0.00-10.00 %)
40054	[a11] External Frequency Start (*100) (0.00-360.00 Hz)
40055	[a12] External Frequency End (*100) (0.00-360.00 Hz)
40056	[b12] Level of E-Thermal Setting (*100) (0.00-655.35 A)
40057	[c41] Level of Overload Signal Setting (*100) (0.00-655.35 A)
40058	[a75] Scale Conversion of PID Control (*100) (0.01-99.99)
40059	[a72] PID P Gain (*10) (0.2-5.0)
40060	[b88] Selection of Operation at FRS Signal Canc. (code) (0:ZST, 1:FST)
40061	Software Switch 1 bit 0:[a41] Torque Boost Method (0:Manual, 1:Automatic) bit 3:[b84] Data Init or Trip History Clear (0:TRIP, 1:DATA) bits 4-5:[b85] Country Code (00:Japan, 01:Europe, 10:USA, 11:Reserved)
40062	[f04] Running Direction (code) (0:fwd, 1:rev)
40063	Delay Timer Selection at FARV Signal On (0:OFF, 1:ON)
40064	[a64] Jump Frequency Width 1 (*10) (0.0-10.0 Hz)
40065	[a66] Jump Frequency Width 2 (*10) (0.0-10.0 Hz)
40066	[a68] Jump Frequency Width 3 (*10) (0.0-10.0 Hz)
40067	Software Switch 2 bit 0:[a15] External Frequency Pattern Setting (0:EXS, 1:0Hz) bit 1:[a51] Selection of DC Braking (1:ON) bit 2:[a71] Selection of PID Control (1:ON) bit 3:[a76] Feedback Destination (0:CUR, 1:VOL) bit 4:[a94] Selection of Method to use Acc2/Dec2 (0:TM, 1:FRE) bit 5:do not change from 1 bit 6:[b87] Stop Key Enabled (0:ON, 1:OFF)
40068	Software Switch 3 bit 0:[c33] Output Terminal AL (0:NO, 1:NC) bits 1-2:[c31-c32] Output Terminals 11-12 (0:NO, 1:NC) bits 3-7:[c11-c15] Input Terminals 1-5 (0:NO, 1:NC)
40069	[a97] Acceleration Pattern (code) (0:Linear, 1:S-curve)
40070	[a98] Deceleration Pattern (code) (0:Linear, 1:S-curve)
40071	[b81] Analog Meter Adjustment (0-255)
40072	[a01] Frequency Commanding (code) (0:VR, 1:TRM, 2:OPE)

Register	Description
40073	[a02] Operation Commanding (code) (1:TRM, 2:OPE)
40074	[b13] Selection of E-Thermal Characteristics (code) (0:SUB, 1:CRT)
40075	[a53] DC Braking Wait Time (*10) (0.0-5.0 s)
40076	[a54] DC Braking Force (0-100)
40077	[a13] External Frequency Start (0-100 %)
40078	[a14] External Frequency End (0-100 %)
40079	[a16] Time Constant of Analog Input (1-8)
40080	[c91] Selection of Debug Mode (code) (0:OFF, 1:ON)
40081	[c01] Function of Input Terminal 1 (code) (0:FW, 1:RV, 2:CF1, 3:CF2, 4:CF3, 5:CF4, 6:JG, 7:2CH, 8:FRS, 9:EXT, 10:USP, 11:SFT, 12:AT, 13:RS)
40082	[c02] Function of Input Terminal 2 (“)
40083	[c03] Function of Input Terminal 3 (“)
40084	[c04] Function of Input Terminal 4 (“)
40085	[c05] Function of Input Terminal 5 (“)
40086	[c21] Function of Output Terminal 1 (code) (0:RUN, 1:FA1, 2:FA2, 3:OL, 4:OD, 5:AL)
40087	[c22] Function of Output Terminal 2 (“)
40088	[c23] Selection of FM Output (code) (0:A-F, 1:A, 2:D-F)
40089	[b31] Software Lock (code) (0-3:MD0-3)
40090	[a39] Stop Mode of Jog Setting (code) (0:FRS, 1:DECL, 2:DB)
40091	[b89] Selection of panel display (0-6:d01-d07)
40092	Adjustment Coefficient of Analog Voltage Input (0-255)
40093	Adjustment Coefficient of Analog Current Input (0-255)
40094	Voltage Class Code (code) (0:100 V, 1:200 V, 2:400 V)
40095	[a03] Base Frequency (*100) (50.00-360.00 Hz)
40096	[a04] Maximum Frequency (*100) (50.00-360.00 Hz)
40097	[b82] Start Frequency (*100) (0.50-9.90 Hz)
40098	Trip History Pointer (code) (see NOTE 1) – *Read Only*
40099	Trip Counter (0-255) – *Read Only*
40100	Trip 1 Accumulated Time (0-ffffffh) (2^{16} ms/digit) – *Read Only*
40101	Trip 1 Cause (code) (see NOTE 2) – *Read Only*
40102	Trip 1 Frequency (*100) (0.00-360.00 Hz) – *Read Only*
40103	Trip 1 Current (*100) (0.00-655.35 A) – *Read Only*
40104	Trip 1 Voltage (0-5000) (0.1V/digit @200V, 0.2V/digit @400V) – *Read Only*
40105	Trip 2 Accumulated Time (0-ffffffh) (2^{16} ms/digit) – *Read Only*
40106	Trip 2 Cause (code) (see NOTE 2) – *Read Only*
40107	Trip 2 Frequency (*100) (0.00-360.00 Hz) – *Read Only*
40108	Trip 2 Current (*100) (0.00-655.35 A) – *Read Only*
40109	Trip 2 Voltage (0-5000) (0.1V/digit @200V, 0.2V/digit @400V) – *Read Only*
40110	Trip 3 Accumulated Time (0-ffffffh) (2^{16} ms/digit) – *Read Only*
40111	Trip 3 Cause (code) (see NOTE 2) – *Read Only*
40112	Trip 3 Frequency (*100) (0.00-360.00 Hz) – *Read Only*
40113	Trip 3 Current (*100) (0.00-655.35 A) – *Read Only*
40114	Trip 3 Voltage (0-5000) (0.1V/digit @200V, 0.2V/digit @400V) – *Read Only*

Register	Description
40115	Status – *Read Only* bit 0:Stopped (1:Stopped) bit 1:Accel/Decel (0:Accel, 1:Decel) bit 2:Running (1:Running) bit 4:Fwd/Rev (0:fwd, 1:rev) bits 5-6:State (00:Stopped, 01:Accel, 10:Decel, 11:Const Speed)
40116	Status1 (0:Stopped, 1-8:Running, 9-10:Tripping) – *Read Only*
40117	[f01] Output Frequency Setting – VM (*100) (0.00-360.00 Hz) – *Read Only*
40118	[f01] Output Frequency Setting – TRM (*100) (0.00-360.00 Hz) – *Read Only*
40119	[f01] Output Frequency Setting – Current Source (*100) (0.00-360.00 Hz) – *Read Only*
40120	[d01] Output Frequency Monitor (*100) (0.00-360.00 Hz) – *Read Only*
40121	[d02] Output Current Monitor (*100) (0.00-655.35 A) – *Read Only*
40122	Ratio of Output Current to Rated Current (*10) (0.0-200.0 %) – *Read Only*
40123	[d03] Rotation Direction Monitor (code) (0:stop, 1:fwd, 2:rev) – *Read Only*
40124	[d04] Feedback PID Control Monitor (*100) (0.00-9999.00) – *Read Only*
40125	[d05] Intelligent Input Terminal Monitor – *Read Only* bit 0:Intelligent Input Terminal 1 Status bit 1:Intelligent Input Terminal 2 Status bit 2:Intelligent Input Terminal 3 Status bit 3:Intelligent Input Terminal 4 Status bit 4:Intelligent Input Terminal 5 Status
40126	[d06] Intelligent Output Terminal Monitor – *Read Only* bit 0:Intelligent Output Terminal 11 Status bit 1:Intelligent Output Terminal 12 Status bit 2:Intelligent Output Terminal AL Status
40127	[d07] Scale Conversion of Frequency [d01] (*100) (0.00-35964.00) – *Read Only*
40128	DC Bus Voltage (*10) (V) – *Read Only*
40129	AC Voltage (*10) (V) – *Read Only*
40130	Instantaneous Power (*100) (kW) – *Read Only*
40131	Ratio of Power to Rated Power (*10) (%) – *Read Only*
40132	Terminal Status – *Read Only* bit 0:Intelligent Input Terminal 1 Status bit 1:Intelligent Input Terminal 2 Status bit 2:Intelligent Input Terminal 3 Status bit 3:Intelligent Input Terminal 4 Status bit 4:Intelligent Input Terminal 5 Status bit 5:Intelligent Output Terminal 11 Status bit 6:Intelligent Output Terminal 12 Status bit 7:Intelligent Output Terminal AL Status

NOTE 1: Trip History Pointer

Trip History Pointer Data	4	3	2	1	0
Trip History Area 1	-	-	1	2	3
Trip History Area 2	-	1	2	3	1
Trip History Area 3	1	2	3	1	2

where: 1=latest trip, 2=2nd trip, 3=3rd trip

NOTE 2: Trip Code Data

Cause of Trip: bit 7 6 5 4 3 2 1 0

Status Code **Trip Code**

Status Code	Condition
b'00	at stop
b'01	at acceleration
b'10	at deceleration
b'11	at constant speed

Trip Code	Cause of Trip	Trip Code	Cause of Trip	Trip Code	Cause of Trip	Trip Code	Cause of Trip
b'000000	Over Current	b'010000	---	b'100000	Over Load	b'110000	CPU Error
b'000001	Over Current	b'010001	---	b'100001	USP Error	b'110001	CPU Error
b'000010	Over Current	b'010010	---	b'100010	PTC Error	b'110010	CPU Error
b'000011	Over Voltage	b'010011	---	b'100011	---	b'110011	---
b'000100	Under Voltage	b'010100	---	b'100100	---	b'110100	CPU Error
b'000101	Over Load	b'010101	---	b'100101	External Trip	b'110101	---
b'000110	EEPROM Error	b'010110	---	b'100110	---	b'110110	---
b'000111	---	b'010111	---	b'100111	---	b'110111	---
b'001000	CPU Error	b'011000	---	b'101000	CPU Error	b'111000	---
b'001001	---	b'011001	---	b'101001	CPU Error	b'111001	EEPROM Error
b'001010	Thermal Error	b'011010	---	b'101010	CPU Error	b'111010	Over Current
b'001011	---	b'011011	---	b'101011	CPU Error	b'111011	Over Current
b'001100	---	b'011100	---	b'101100	CPU Error	b'111100	Over Current
b'001101	Ground Fault	b'011101	---	b'101101	CPU Error	b'111101	Over Current
b'001110	CPU Error	b'011110	---	b'101110	CPU Error	b'111110	Over Voltage
b'001111	Over Supply Voltage	b'011111	Under Voltage	b'101111	CPU Error	b'111111	Under Voltage