HITACHI
Inspire the Next

Application Note:

SJ series type P1 –

EzCOM Master / Follower Configuration

**Please also refer to the
SJ series type P1 User's Manual**

AN190726-1 Rev A

Hitachi Industrial Equipment & Solutions America, LLC

# Hitachi SJ series type P1 - EzCOM Function

Overview

EzCOM is a function that allows multiple inverters to communicate with each other without a PLC or other master device such as a computer. The only connection between the inverters are two small wires, making installation very simple. Within the EzCOM network, each inverter will be assigned a role, from the list below.

- Controlling Inverter or Administrator
- Master Inverter
- Slave or Follower Inverter

The controlling inverter designates an inverter within the network as a master inverter which will give the commands on the network sequentially. A master inverter can write to 5 different commands held in retention registers of arbitrary slave inverters. Once a data transmission between a

master and slaves is complete, the controlling inverter shifts a master inverter sequentially and repeats a data transmission in accordance with the settings of the respective master inverters. The controlling inverter is always fixed but the master inverter is shifted sequentially. The controlling inverter can be a master or slave inverter. Up to 8 inverters can function as a master inverter. As with normal Modbus communication (RS-485), connect the SP and SN terminals of the inverters in the EzCOM network.

EzCOM / Modbus wiring
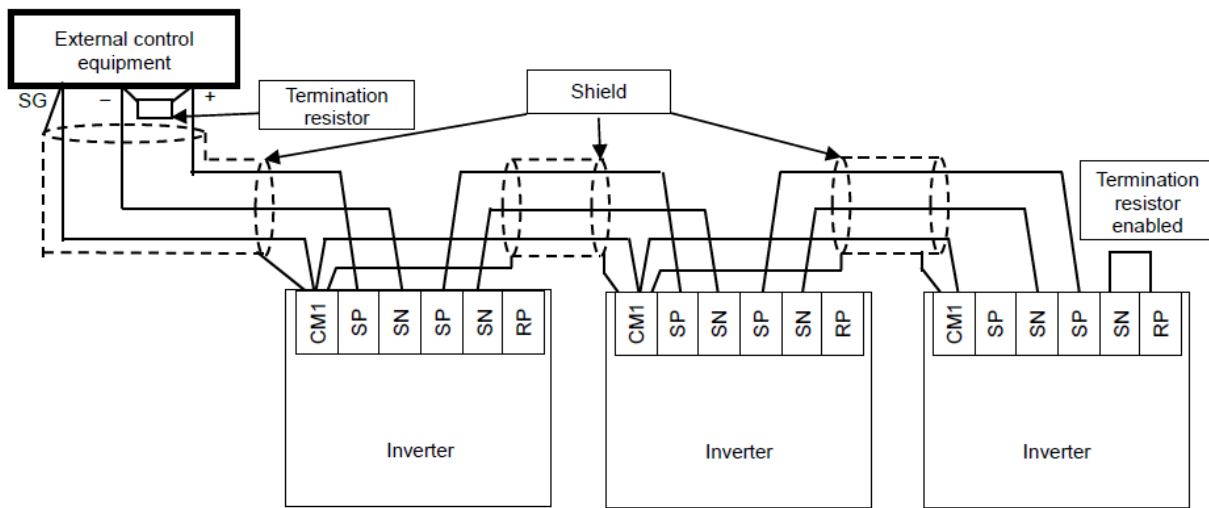
EzCOM / Data Transmission
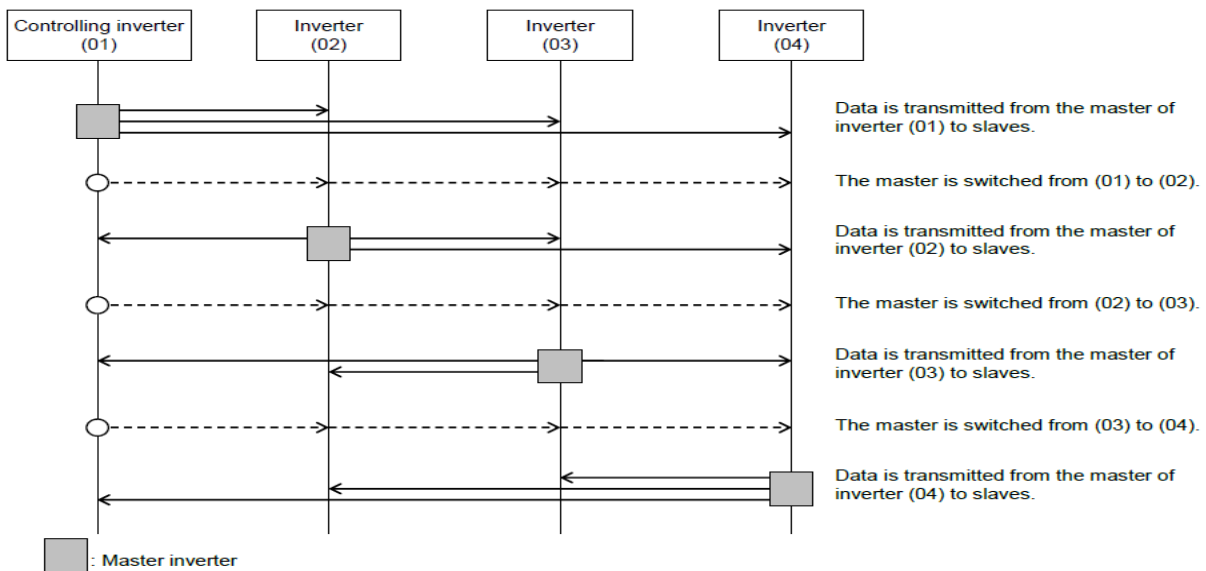
EzCOM Parameters

Please use the following tables below for the EzCOM parameters.

Item	Parameter	Data	Set-up Destination	Description
Communication station number selection *1	[CF-02]	1-247	ALL	Station number setting
Communication error operation selection	[CF-05]	00	ALL	Trip
		01	ALL	Trips after decelerating and stopping
		02	ALL	Ignore
		03	ALL	Free-Run
		04	ALL	Deceleration stop
Communication timeout time	[CF-06]	0.00	ALL	Communication timeout disabled
		0-100.00	ALL	Unit (seconds)
Communication waiting time	[CF-07]	0-1000	ALL	Unit (ms)
Communication Selection	[CF-08]	1	--	Modbus-RTU communication
		2	B	EzCOM communication
		3	A	EzCOM communication (controlling inverter)
EzCOM start station number *2	[CF-20]	1 - 8	A	Setting required for controlling inverter only
EzCOM end station number *2	[CF-21]	1 - 8	A	Setting required for controlling inverter only
EzCOM start selection	[CF-22]	0	A	Start-up by input terminal
		1	A	Always communication
Input terminal 1 to 9, A or B selection	[CA-01 – CA-11]	098	A	[ECOM] Starting up of EzCOM via digital input

■ Set-up destinations
ALL: Set to all inverters used for EzCOM
A: Set to only an inverter for controlling (station number 01)
B: Set to inverters other than the controlling inverter (station number 01)

*1) When you provide multiple master inverters, set consecutive station numbers (01, 02, 03, …) to them. If the numbers are not consecutive, the inverters cannot perform communication.
*2) Note that the relationship between the master start/end station number settings must be [CF-20] ≤ [CF-21].

■Command settings for assigning master inverters

Item	Parameter	Data	Set-up Destination	Description
Number of EzCOM transmitting data	[CF-23]	1-5	M	Sets how many of the registers 1 to 5 shown below to be transferred in EzCOM communication.
EzCOM transmission destination station number 1	[CF-24]	1-247	M	Station number for transmission destination 1
EzCOM transmission destination register 1 *3)	[CF-25]	0000h-FFFFh	M	Sets the high order register of transmission destination 1
EzCOM transmission source register 1 *3)	[CF-26]	0000h-FFFFh	M	Sets the low order register of transmission source 1
EzCOM transmission destination station number 2	[CF-27]	1-247	M	Station number for transmission destination 2
EzCOM transmission destination register 2 *3)	[CF-28]	0000h-FFFFh	M	Sets the high order register of transmission destination 2
EzCOM transmission source register 2 *3)	[CF-29]	0000h-FFFFh	M	Sets the low order register of transmission source 2
EzCOM transmission destination station number 3	[CF-30]	1-247	M	Station number for transmission destination 3
EzCOM transmission destination register 3 *3)	[CF-31]	0000h-FFFFh	M	Sets the high order register of transmission destination 3
EzCOM transmission source register 3 *3)	[CF-32]	0000h-FFFFh	M	Sets the low order register of transmission source 3
EzCOM transmission destination station number 4	[CF-33]	1-247	M	Station number for transmission destination 4
EzCOM transmission destination register 4 *3)	[CF-34]	0000h-FFFFh	M	Sets the high order register of transmission destination 4
EzCOM transmission source register 4 *3)	[CF-35]	0000h-FFFFh	M	Sets the low order register of transmission source 4
EzCOM transmission destination station number 5	[CF-36]	1-247	M	Station number for transmission destination 5
EzCOM transmission destination register 5 *3)	[CF-37]	0000h-FFFFh	M	Sets the high order register of transmission destination 5
EzCOM transmission source register 5 *3)	[CF-38]	0000h-FFFFh	M	Sets the low order register of transmission source 5

■ Set-up destinations
M: Perform the setting to inverters having station numbers designated between [CF-20] and [CF-21] that are set to master inverters

*3) For correct addressing in the EzCOM transmission destination and source registers, please subtract one from the register number.

Please refer to the P1 User's Guide Chapter 13 for information on the EzCOM and Modbus communication settings. You will also find a listing of the Modbus holding registers.

EzCOM Example

The following example will use the keypad speed reference and digital input run command from the master inverter, acting as the administrator to send up to 5 register values to the follower inverters. The EzCOM communication protocol does not support coil data values. Therefore, we use a specific register value to transfer all the operational coils that are referenced in the control terminal as bit values (0001h to 000Fh) to the following inverter. Additional data values, such as trip points or monitoring values can also be transferred with in EzCOM or into EzSQ user registers for additional performance.

Parameter	Data Name	Master Set Value	Follower Set Value
AA101	Speed Reference	07: Keypad	08: RS485
AA111	Run Command	00: Terminal	00: Terminal
CF-02	Modbus Address	01	02
CF-05	Communication error operation	00: Trip	00: Trip
CF-06	Communication timeout	1	1
CF-08	Communication Selection	02: EzCOM controlling inverter	01: EzCOM
CF-20	EzCOM master start station	1	No change
CF-21	EzCOM master end station	1	No change
CF-22	EzCOM start selection	1	1
CF-23	Number of EzCOM transmitting data	2	No change
CF-24	EzCOM transmission destination station number	2	No change
CF-25	EzCOM transmission destination register	2906	No change
CF-26	EzCOM transmission source register	2714	No change
CF-27	EzCOM transmission destination station number 2	2	No change
CF-28	EzCOM transmission destination register 2	3EBB	No change
CF-29	EzCOM transmission source register	3EBB	

Once all parameters have been set in both inverters; please power the inverters down. Now, power up only the follower or slave inverter and wait 5 seconds. Next, power up the master inverter and the EzCOM should now be up and running.

Please contact Hitachi America Limited for questions or concerns with the SJ series type P1 inverters or the EzCOM communication.

Technical Support phone: 980-500-7141

Email: Inverter.Info@hitachi-iesa.com

Web: https://www.hitachi-iesa.com/ac-drives-inverters