

Firmware Upgrade for FR-A800-AWH Inverters (FR-A800 Plus Series)

Thank you for your continued patronage of Mitsubishi Electric drive control products.
 The firmware of FR-A800-AWH inverters (FR-A800 Plus series) will be upgraded to improve functionality.

1. Products Affected

FR-A800-AWH inverters (FR-A800 Plus series)

2. Details of Change

(1) Multi-axis synchronous control (Ethernet model)

Multi-axis synchronous operation is available for the lift axis or the travel axis.

Multiple slave axes are operated in synchronization with a command of the reference master axis such as the torque current command and speed command.

Synchronization between the master and slave is available by adding the AWH dedicated function to the conventional inverter-to-inverter link function.

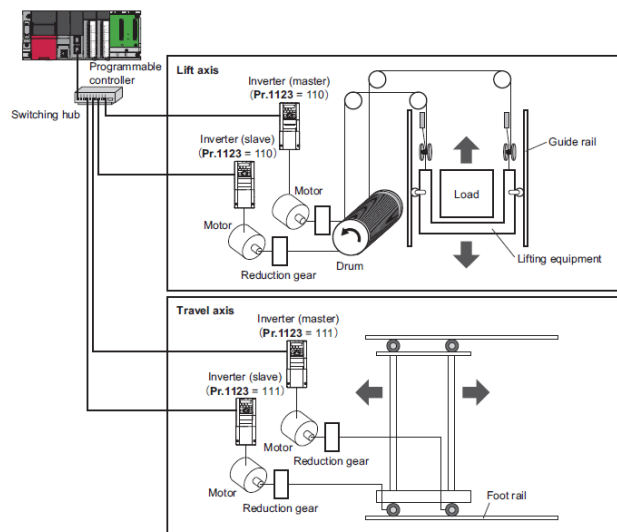
Application	Type	Features	Control method			
			Vector control	Real sensorless vector control	Advanced magnetic flux vector control	V/F control
Rigid system*1	Slave station torque control (speed compensation between axes)	Torque balancing control in each axis, vibration suppression during fast-response operation of the master	○	×	×	×
Semi-rigid system*2	Slave station speed control (relative droop compensation)	Torque balancing control in each axis, prevention of sudden speed change when the load changes suddenly	○	○	×	Δ *3

○: Available, ×: Not available, Δ: Available with restrictions

*1 Highly rigid system (difficult to deform when force is applied), requiring torque balancing between axes.

*2 Rigid system which may become a non-rigid system due to reasons such as wheel spin.

*3 Droop control is disabled under V/F control. Speed synchronous control is available.



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1) Slave station torque control

The AWH dedicated inverter-to-inverter link function (described in (2) Enhanced inverter-to-inverter link function) is used for multi-axis synchronous control. The master station broadcasts data to slave stations, enabling torque control in synchronization.

Setting values will be added as follows.

Pr.	Name	Initial value	Setting range	Description
60 W000 W100	A800-AWH mode selection	0	0	A800-AWH mode disabled
			1	A800-AWH mode enabled
			2	Full-closed control test operation
			10 (added)	Slave station torque control
804 D400	Torque command source selection	0	20 (added)	The torque current command from the master station is used as the torque command.
807 H410	Speed limit selection	0	20 (added)	Speed limit is set by the speed command after position loop of the master station.

Parameters will be added as follows.

Pr.	Name	Initial value	Setting range	Description
1144 W065	Multi-axis synchronous control (torque control) speed limit width	0 Hz	0 to 100 Hz	Set the speed limit range during multi-axis synchronous control (torque control).
1145 W066	Multi-axis synchronous control (torque control) speed compensation P gain	0%	0% to 1000%	Set the proportional gain during multi-axis synchronous control (torque control).

2) Slave station speed control

The AWH dedicated inverter-to-inverter link function (described in (2) Enhanced inverter-to-inverter link function) is used for multi-axis synchronous control. The master station broadcasts data to slave stations, enabling speed control in synchronization.

Under Vector control or Real sensorless vector control, the frequency command can be compensated by relative droop control so that torque can be balanced between the master station and the slave station.

Setting values will be added as follows.

Pr.	Name	Initial value	Setting range	Description
60 W000 W100	A800-AWH mode selection	0	11 (added)	Slave station speed control

(2) Enhanced inverter-to-inverter link function (Ethernet model)

The AWH dedicated inverter-to-inverter link function will be added.

Up to two groups can be set for master-slave communication.

Setting values will be added as follows.

Pr.	Name	Initial value	Setting range	Description	
1123 N680 *1	Inverter-to-inverter link mode selection	0	0	After the scan by the PLC function is complete, communication with the slave is started using unicast transmissions.	
			110 (added)	AWH dedicated inverter-to-inverter link function group 1	Data is transmitted to the slave using broadcast transmissions (multi-axis synchronous control). Two systems can be configured for the inverter-to-inverter link function in the same network.
			111 (added)	AWH dedicated inverter-to-inverter link function group 2	

*1 The setting is applied after an inverter reset or next power-ON.

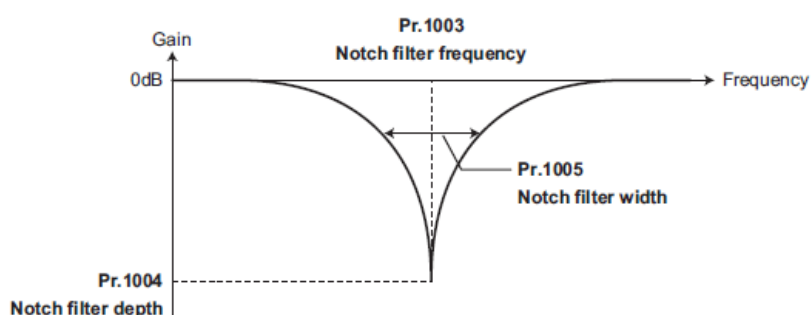
(3) Notch filter

A notch filter will be available for the FR-A800-AWH.

The response level of speed control in the resonance frequency band of mechanical systems can be lowered to avoid mechanical resonance.

Parameters will be added as follows.

Pr.	Name	Initial value	Setting range	Description
1003 G601	Notch filter frequency	0	0	No notch filter
			8 to 1250 Hz	Set the frequency for the center of gain attenuation.
1004 G602	Notch filter depth	0	0 to 3	0 (Deep) → 3 (Shallow)
1005 G603	Notch filter width	0	0 to 3	0 (Narrow) → 3 (Wide)

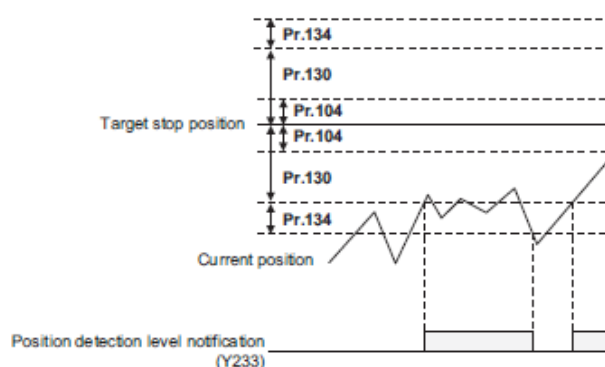


(4) Crane position detection range hysteresis

When a current position varies, the Crane position detection level notification (Y233) signal may repeat ON/OFF (chatter). Setting hysteresis to the detected position prevents chattering of the signal. Use Pr.134 Crane position detection range hysteresis to set a hysteresis width.

Parameter will be added as follows.

Pr.	Name	Initial value	Setting range	Description
134 W043	Crane position detection range hysteresis	9999	0 to 100 mm	Set the hysteresis width for the detected position where the Crane position detection level notification (Y233) signal turns ON.
			9999	Hysteresis width is not set.



(5) Addition of conditions to indicate the Ethernet communication fault (E.EHR)

"E.EHR" is displayed when an Ethernet communication error occurs.

When the AWH dedicated inverter-to-inverter link function is enabled, the inverter output is shut off when the LNK signal turns OFF after the first start.

3. Date of Change

The change will be sequentially applied to the products manufactured in January 2023 or later.

4. Product Identification

The SERIAL (determined by date of production) can be checked on the rating plate or packaging plate.

SERIAL example on rating plate	SERIAL example on packaging plate
□ 3 1 ○○○○○○	□ 3 1 ○○○
<u>Symbol Year Month Control number</u>	<u>Symbol Year Month Control number</u>

SERIAL

SERIAL

The SERIAL consists of one symbol, two characters indicating the production year and month, and the control number (six characters for the rating plate, three characters for the packaging plate).

The last digit of the production year is indicated as the Year, and the Month is indicated by 1 to 9, X (October), Y (November), or Z (December).