UniStar P Tower/RT Series
Parallel Quick Installation Guide

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This document will allow service engineers/users to easily understand the procedures for the installation of a UniStar P parallel system.

Caution: UniStar P series UPS can only be paralleled with the same model/capacity units. A maximum of 4 units can be wired in parallel.

There are 4 steps to completing a successful parallel installation:

1. **Single units check** – To check and ensure that settings and output voltages of each individual unit are correct.
2. **Parallel wiring** – To complete the physical power wiring between each unit.
3. **Parallel setting** – To complete the proper variable settings of each unit that will be paralleled.
4. **Test startup** – Test startup procedures to verify the parallel function is running normally.

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SECTION 1

SINGLE UNIT CHECK

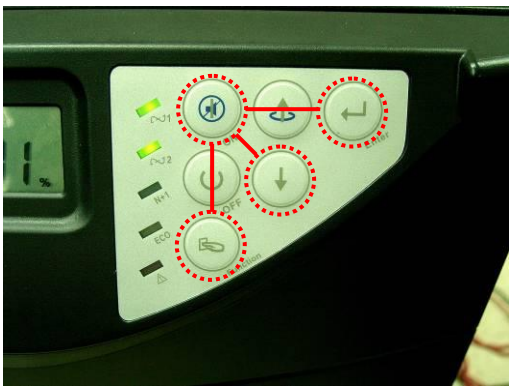
Parameters Check – Perform the following steps for all individual units first.

- Connect AC input power, without output connection.
- Turn on input breaker, and do not turn on inverter,
- Enter setting mode by pressing <On> & <↓> keys simultaneously for 3 seconds.
- Refer to the table1-1 next page, Check all parameters are default values.
- "Bypass Voltage Range", "Synchronize frequency Range" and "Inverter Output Voltage" are adjustable. But every unit for parallel must be the same setting.
- Change item to "Save", press Enter"↵ to save setting.

Caution: The setting will never be changed until a SAVE action is entered.

- Shut off AC input while LCD shows "LINE OFF" to reset the UPS.

MSII Combo Control Keys List



<ON>+<Function> → Service Mode

<ON>+<↓> → Setting Mode

Basic Function Check

- Turn on the UPS, Run the inverter, test the UPS in normal AC mode.
- Confirm that the LCD panel display works normally.

Output Error Voltages Check

- Check each unit's inverter output voltage, and make sure there is no more than 1.0Vac difference for all units to be paralleled.
- **If there is greater than 1.0Vac difference in output voltage then calibration must be performed or damage could occur when attempting to parallel the units. Please consult the factory.**

Table 1 Setup Mode Functions List

Item Press <↓> to change	Display List	
	Default	Press <↑> to change value
Buzzer on/off	b_on	b_oF
Self-Test	tnon	trun (Available in Line-Mode only)
Bypass Voltage Range	S_HI	S_Lo
Inverter Synchronize Frequency Range	SH03 Hz	SH01 Hz
Inverter Output Voltage*	o220 V	o200 V, o208 V, o230 V, o240 V
Operation Mode	norL	Eco, cF50 Hz, cF60 Hz
Output Voltage Adjustment	oA 0%	oA-3%, oA-2%, oA-1%, oA 1%, oA 2%, oA 3%
Parallel ID Number**	Id01	Id02, Id03, Id04
Parallel Function on/off ***	P 01	P 02
SAVE	SAvE	Press <↵ > to Save
After Saved UPS Locked	LINE oFF	Shut off input AC power to reset UPS.

* Output voltage default value depends on different nation or order requested. For example, the default

voltage in North America will be 208V.
** Single unit ID number must be “01”, or UPS will have an Er17 error code.
*** Single unit Parallel function must be “OFF” (P 01), or the UPS will have an Er21 error code.

SECTION 2

PARALLEL WIRING

Power Wiring

- Grounding wires must be connected properly.
- The Input / Output phase for all units must be correct.

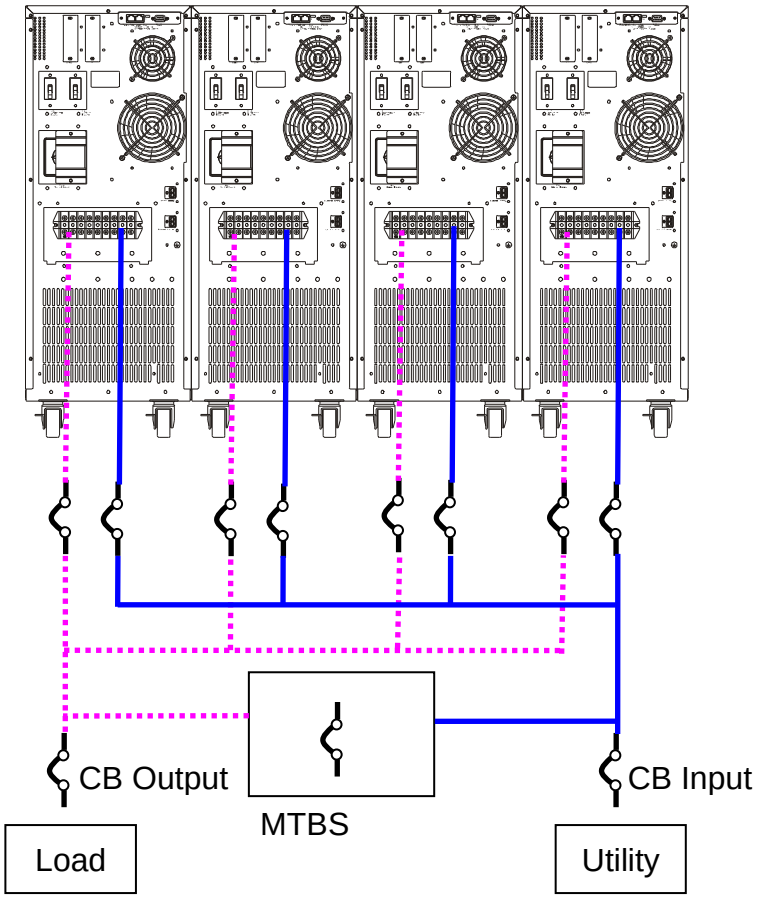


Figure 1 Standard Parallel Wiring for Tower Units

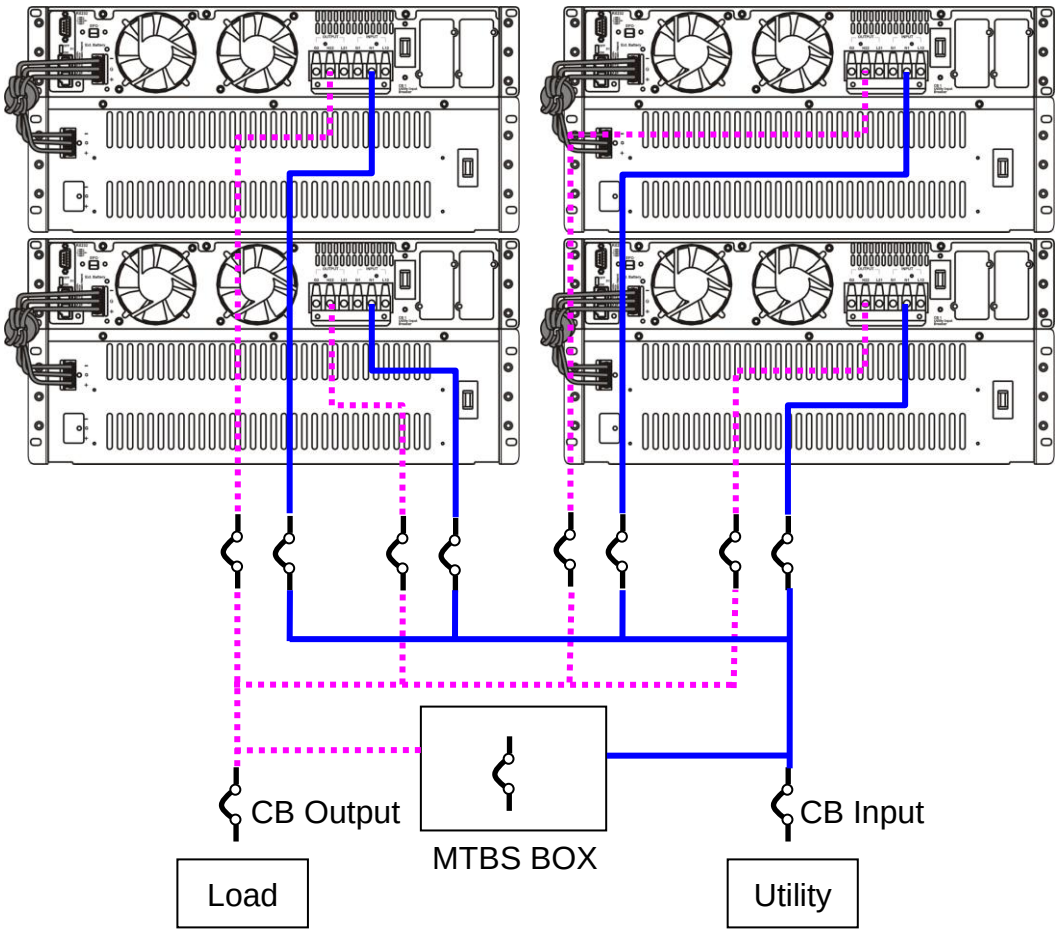
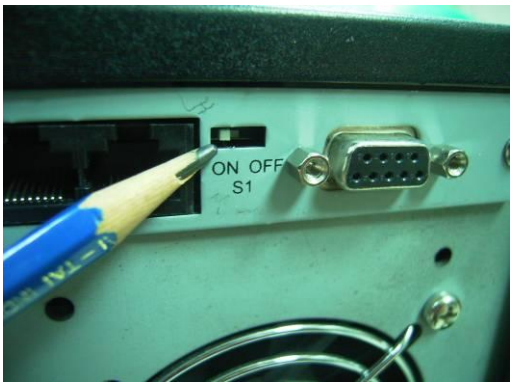


Figure 2 Standard Parallel Wiring for RT Units

Communication Cables Wiring And Terminal-Resistors Setting

- **Two and only two** units' "Terminal Resistors" must be turned on.

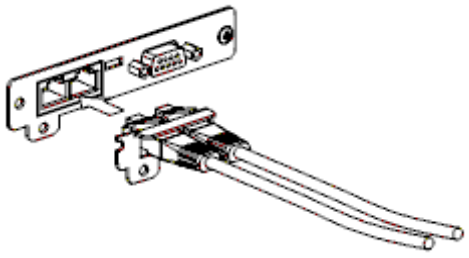


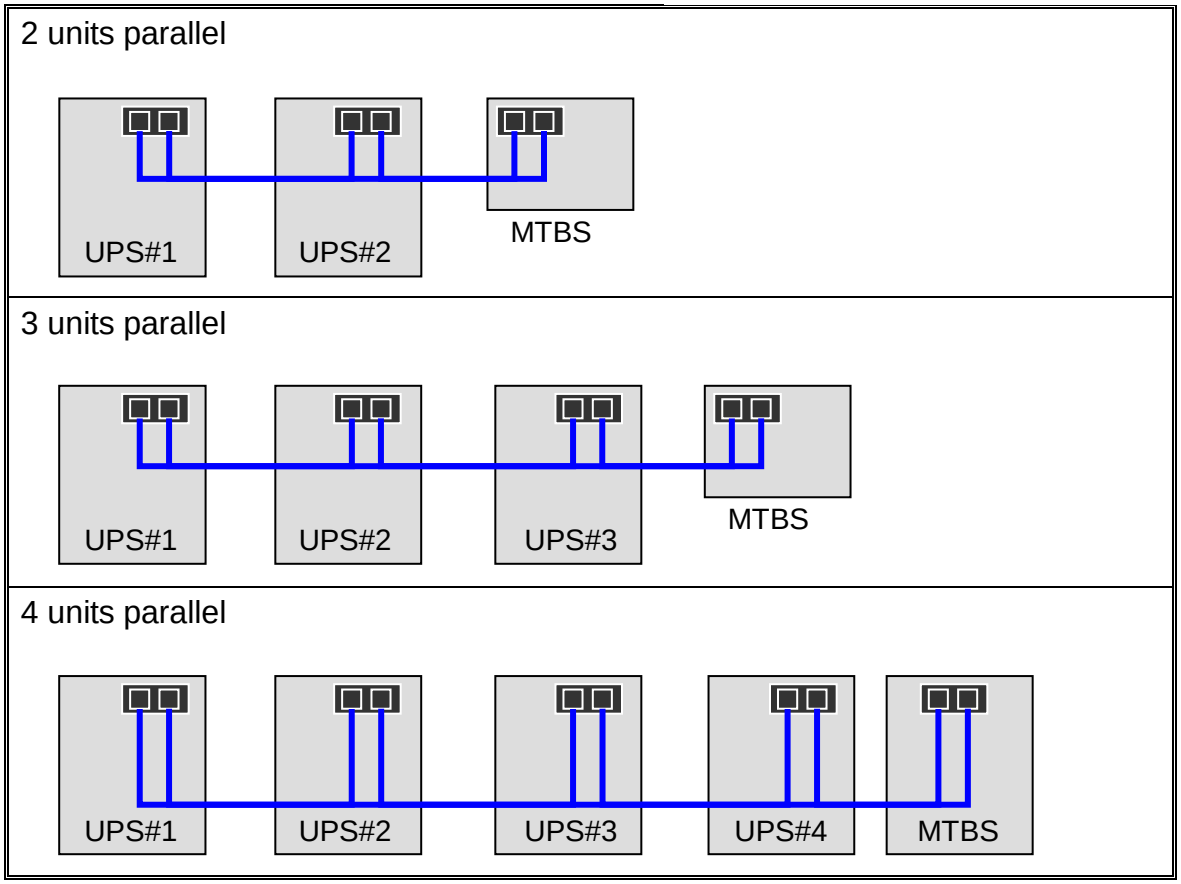
Parallel unit Terminal Resistor setting examples

Parallel Units	Terminal Resistor Status			
	UPS1	UPS2	UPS3	UPS4
2 units	ON	ON	---	---
3 units	ON	OFF	ON	---
4 units	ON	OFF	OFF	ON

Caution: Incorrect Terminal Resistor settings cannot be detected by the UPS, and will cause failure of one or more UPS's in the system.

- Please use standard parallel kit fixing plate to secure parallel cables.
- Connect parallel RJ-45 cables as a "Ring-Network" as below.





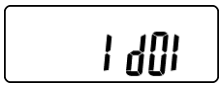
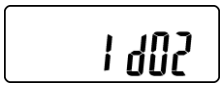
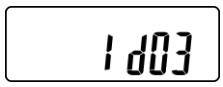
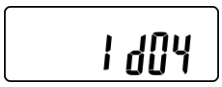
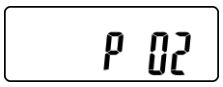
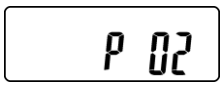
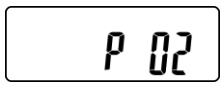
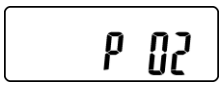
Note: MTBS BOX as shown in Fig. 1 and Fig.2 is optional equipment.

SECTION 3

PARALLEL SETTING

Parallel Function Enable and ID Numbers

- Turned on UPS AC input independently (Inverter off).
- Enter Setup Mode.
- Set ID numbers different for each UPS. Assign one UPS as the Master and set its ID number to “Id01”.
- Set Parallel function “Enable” (P 02)

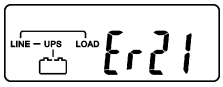
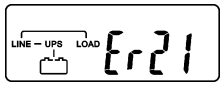
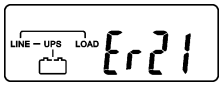
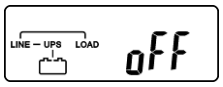
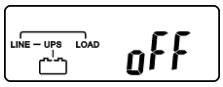
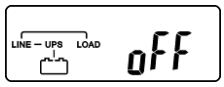
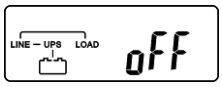
UPS#	UPS#1	UPS#2	UPS#3	UPS#4
ID Number				
Parallel Function				

SECTION 4

TEST STARTUP

Er21 Check (Communication Failure or Cannot find ID1 unit)

- Turn on AC input for UPS#2, UPS#3, UPS#4, while leaving UPS#1 (Id01) completely off.
- UPS#2, UPS#3, UPS#4 LCD will show “Er21”.
- Turn on UPS#1 AC input.
- UPS#2, UPS#3, UPS#4 “Er21” will not show, indicating that UPS#1 has been identified by the network.

UPS#	UPS#1	UPS#2	UPS#3	UPS#4
Test	AC OFF			
Test OK				

- If Er21 continues to appear, one or more communication problems exist. Please double check the settings and the parallel cables before continuing on.

Caution: Do not start any inverter before the Er21 test has been completed successfully or damage to one or more UPS’s may occur.

Redundancy Function Check

- Turn on 2 or more units, the redundancy indicator “N+1” LED will be lit (If normal).

- For 2 units paralleled, If load more than 50%, the “N+1” LED will dim. For 3 units paralleled is 66%, and 4 units paralleled will be 75%.
- Decrease the load under redundancy load point, the “N+1” LED will be lit again.

This completes the installation and initial test of the parallel UPS system. Please refer to the following section if any error codes appear in the display of any UPS.

SECTION 5

Other Errors Code Explanations And Trouble Shooting

- **Er16 (Output Parameters Setting Error)**
  Cause:
  If an Er16 appears during test 4.1, then there are one or more parameters setting in conflict between each unit.
  Solution:
  Repeat the installation process from the beginning and verify that all parameters and settings are correct.
- **Er17 (ID Numbers are in conflict in Parallel System or ID number Error in single unit)**
  Causes:
  2 or more units have the same ID number. (Parallel system)
  Parallel function is not enabled, but ID number is not 01. (Single unit)
  Solutions:
  - Change ID number setting.
  - Change ID number as 01.
- **Er27 (The UPS Must Be Operated in Normal-Mode in Parallel System)**
  Cause:
  UPS is not set to “Normal Mode”. “ECO Mode” and “Frequency-Converter Mode” are not supported for parallel system.
  Solution:
  Change UPS setting to “Normal mode”.
- **Er08 (DC BUS High Level Abnormal)**
  Cause:
  - If the voltage difference between each unit is higher than 1.0Vac, An Er08 could happen during parallel system starting up.
  - Improper installation or parallel system communication failure.

Solution:

- Check inverter output voltage independently for each unit. And apply calibration procedures to the units which have abnormal output voltage. Consult the factory is the voltage is greater than 1.0Vac.
- Check parallel setting and verify 4.1 Er-21check to the system.

- **Er34 (Balance Function Conflicted)**

  Cause:

  A unit with newer version than MS30074K was paralleled with older version unit(s).

  Solution:

  Use a distributor version “UPS Setting Tool” software to enable special function flag #8 can make the new version compatible with the old version. Consult the factory.