TOSHIBA

G9000 SERIES

MMS KIT

INSTALLATION MANUAL

480/480 V　1000/1330/1500/1660/2000kVA

Document No.: 200150-001
Document: 4GBH0153　Rev. B
March 2020

TOSHIBA

IMPORTANT NOTICE

Never attempt to install, operate, maintain or dispose of this equipment until you have first read and understood all of the relevant product warnings and user directions that are contained in this Installation manual.

The installation of this equipment must only be performed by qualified personnel.

The Instructions contained in this manual are not intended to cover all of the details or variations in equipment or to provide for every possible contingency to be met in connection with installation, operation, or maintenance. Should further information be required or should particular problems arise which are not covered sufficiently the matter should be referred to the local TOSHIBA sales office.

Nothing in this manual shall alter Toshiba International Corporation's standard terms and conditions or the conditions of any written sales contract.

Any Electrical or mechanical modifications to this equipment without prior written consent of TOSHIBA will void all warranties and may void UL/CUL listing. Unauthorized modifications may also result in personal injury, death, or equipment damage.

UNINTERRUPTIBLE POWER SYSTEM

If additional information or technical assistance is required call TOSHIBA Customer Support Center at (877) 867-8773, or write to: Toshiba International Corporation, 13131 West Little York Road, Houston, TX 77041-9990 Attn: UPS Product Manager.

Keep this manual with the UPS equipment.

Job Number:_____

Model Number: _____

Serial Number:_____

Application:_____

Shipping Date:_____

Date of Installation:_____

Inspected By:_____

TOSHIBA

Purpose and Scope of Manual

This manual provides information on how to safely install, operate, and maintain your TOSHIBA power electronics product. This manual includes a section on General Safety Instructions that describes the warning labels and symbols that are used throughout the manual. Read the manual completely before installing, operating, or performing maintenance on this equipment.

This manual and the accompanying drawings should be considered a permanent part of the equipment and should be readily available for reference and review. Dimensions shown in the manual are in metric and/or the Imperial equivalent.

TOSHIBA reserves the right, without prior notice, to update information, make product changes, or to discontinue any product or service identified in this publication.

TOSHIBA is a registered trademark of TOSHIBA INTERNATIONAL CORPORATION. All other product or trade references appearing in this manual are registered trademarks of their respective owners.

TOSHIBA shall not be liable for technical or editorial omissions or mistakes in this manual. Nor shall it be liable for incidental or consequential damages resulting from the use of information contained in this manual.

Printed in Japan

Contacting TOSHIBA Customer Support Center

The TOSHIBA Customer Support Center can be contacted to obtain help in resolving any **Uninterruptible Power System** problem that you may experience or to provide after sales service support.

Toshiba Customer Support Center
8 a.m. to 5 p.m. (CST) – Monday through Friday
Tel (877) 867-8773
Fax (713) 896-5212
E-mail – *TIC-UPSservice@toshiba.com*

You may contact TOSHIBA by writing to:

TOSHIBA INTERNATIONAL CORPORATION.
SOCIAL INFRASTRUCTURE SYSTEMS GROUP
POWER ELECTRONICS DIVISION
13131 West Little York Rd.
Houston, TX 77041-9990
Attn: UPS Product Manager

For further information on Toshiba products and services, please visit our website at:
http://www.toshibaups.com/

Table of Contents

List of Tables

List of Figures

This Page Left Intentionally Blank

1 How to use this Manual

This manual is designed for ease of use, giving the user easy and quick reference to information.
This manual uses notice icons to draw attention to the user important information regarding the safe operation and installation of the UPS.

1.1 Notice Icons

The notice icons used in this manual are explained below, and should be taken into account and adhered to whenever they appear in the text of this manual.

WARNING

Warning: A warning symbol shows potentially hazardous situation or condition which could result in personal injury or death, if not avoided.

CAUTION

Caution: A caution symbol shows potentially hazardous situation or condition which could result in personal injury or equipment damage, if not avoided.

NOTE

Note: A Note symbol shows the information the user or the service personnel should observe during the UPS operation or service work.

PROHIBIT

Prohibit: A prohibit symbol shows the act the user or the service personnel should NEVER perform during the UPS installation, operation or service work.

Safety Recommendations: If any problems are encountered while following this manual, contact the Toshiba Customer Support Center.

1.2 Qualified Personnel

Only qualified persons are to install, operate or service this equipment according to all applicable codes and established safety practices.

A qualified person must:

1) **Read this entire instruction manual carefully.**
2) Be skilled in the installation, construction or operation of the equipment and aware of the hazards involved.
3) Be trained and authorized to safely energize, de-energize, clear, ground, lockout and tag circuits in accordance with established safety practices
4) Be trained and authorized to perform the service, maintenance or repair of this equipment
5) Be trained in the proper care and use of protective equipment such as rubber gloves, hard hat, safety glasses, face shield, flash clothing, etc. in accordance with established practices
6) Be trained in rendering first aid.

2 OVERVIEW

TOSHIBA G9000 Uninterruptible Power Supply Systems (UPS) need an MMS KIT whenever two or more UPSs are installed in parallel operation configuration.
Each UPS requires an MMS KIT installed to allow it to complete the communication circuit with other modules.

CAUTION

All UPSs must be de-energized when the MMS KITs are installed and the parallel interconnections are established between the modules.

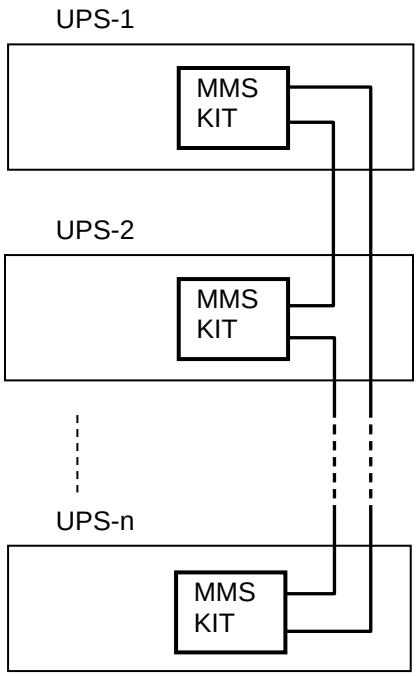


Figure 2-1: Parallel-Connection between UPSs

3 MMS KIT Parts List

Table 3-1: Parts List of MMS KIT

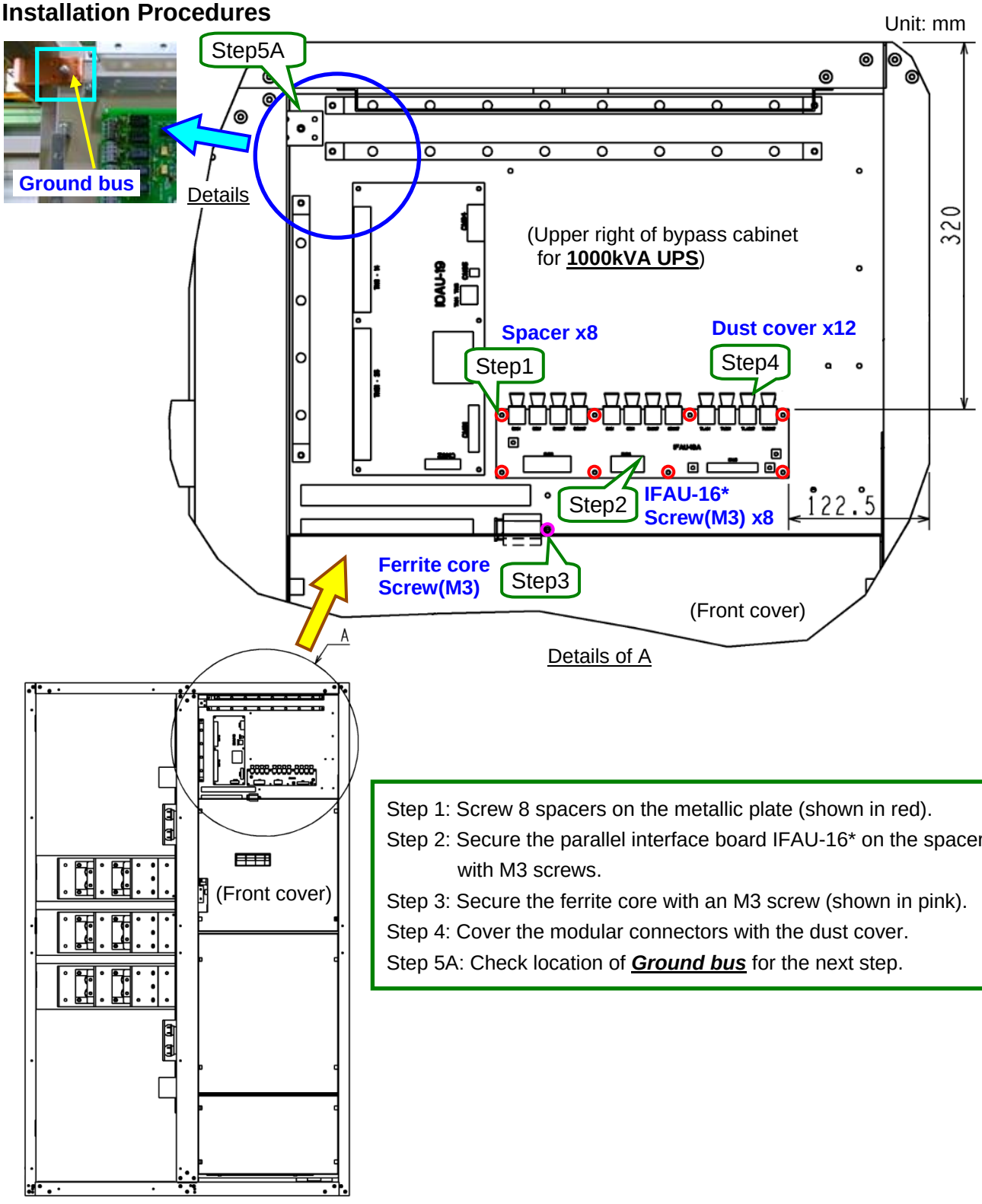
Part #	Part name	Qty	Remarks
1	Parallel Interface board: IFAU-16* (IF3)	1	
2	Cable: CN95 (IFAU-16* - UPJR-D*)	1	1865mm HIF3-20D - HIF3-20D
3A	Cable: CN94 (IFAU-16* - UPJR-D*)	1	1820mm, J-10P - J-8P
3B	Cable: CN96 (IFAU-16* - CSAU-07*)	1	1180mm, J-16P - J-16P
3C	Wire: IFAU-16* GNDB(M3 clamp) - Ground bus bar (M4 clamp)	1	1170mm, Green
3D	Wire: IFAU-16* GNDC(M3 clamp) - Ground bus bar (M4 clamp)	1	1220mm, Green
3E	Wire: IFAU-16* GNDD(M3 clamp) - Ground bus bar (M4 clamp)	1	1070mm, Green
4	Spacer: SQ-14(MBB-314)	8	
5	Ferrite Core: E2530MRC	1	
6	Dust Cover for LAN Jack: LD-DUSTBK6	12	6pcs/pack x 2
7	Screws (M3)	8	
8	Spring washers (M3)	8	
9	Flat washers (M3)	8	
10	Screws (M4)	1	
11	Cable Tie (T30R)	18	Use as necessary
12	Cable Tie (T50R)	2	Use as necessary
13	Base (ABMM-A-D)	15	Use as necessary

* – PCB revision suffix may be applied.

Part #1: Parallel Interface board (IFAU-16*) 	Part #2: Cable 
Part #3A, 3B: Cable 	Part #3C, 3D, 3E: Wire 
Part #4: Spacer 	Part #5: Ferrite Core 
Part #6: Dust Cover for LAN Jack 	Part #7: Screw(M3), Part #10:Screw(M4)  

Figure 3-1: MMS KIT Parts Identification

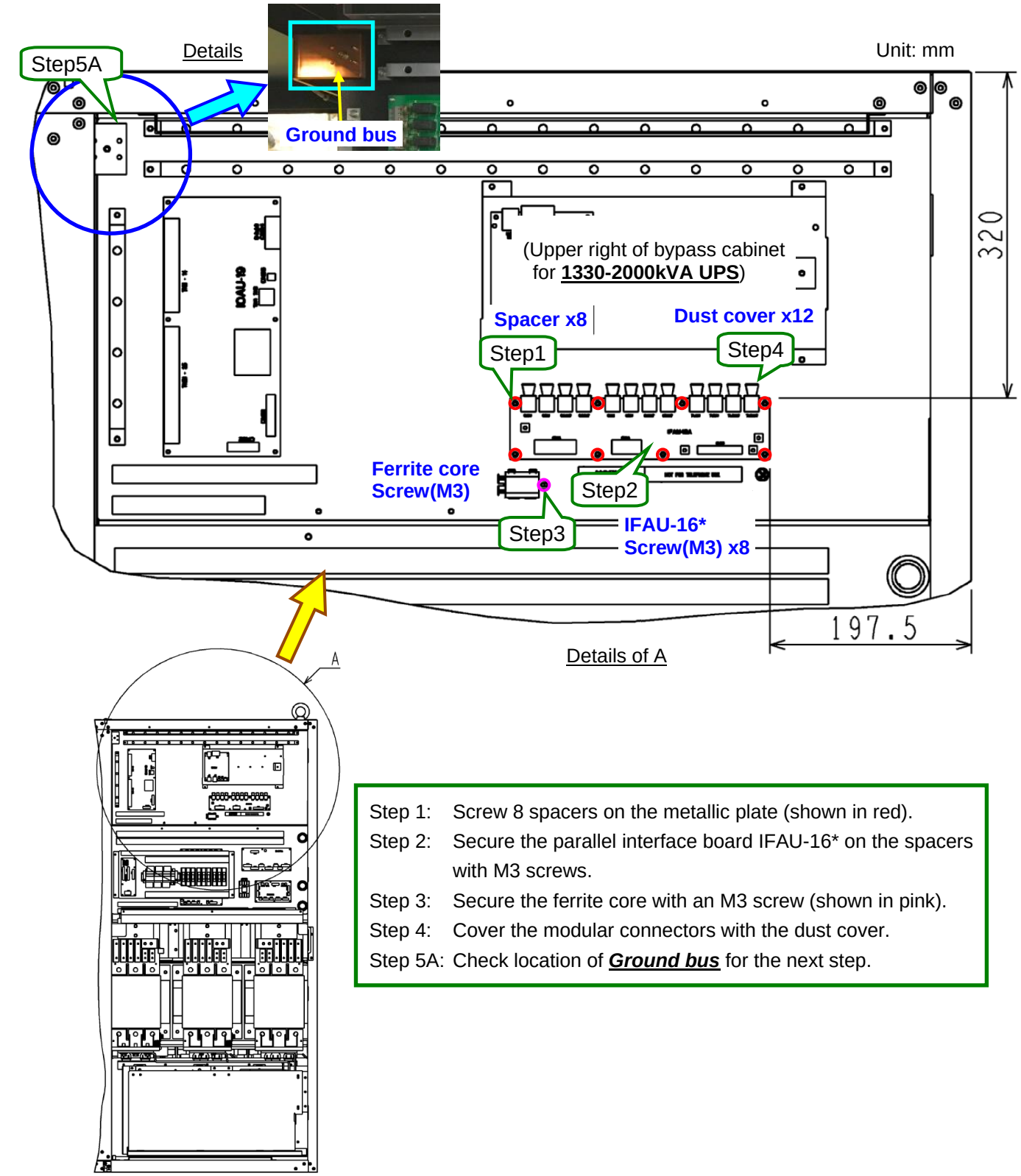
4 Installation Procedures



Front View of bypass cabinet (with door open)

Step 1: Screw 8 spacers on the metallic plate (shown in red).
Step 2: Secure the parallel interface board IFAU-16* on the spacers with M3 screws.
Step 3: Secure the ferrite core with an M3 screw (shown in pink).
Step 4: Cover the modular connectors with the dust cover.
Step 5A: Check location of ***Ground bus*** for the next step.

Figure 4-1: Location of IFAU-16* MMS PCB Installation (1000kVA)



Step 1:	Screw 8 spacers on the metallic plate (shown in red).
Step 2:	Secure the parallel interface board IFAU-16* on the spacers with M3 screws.
Step 3:	Secure the ferrite core with an M3 screw (shown in pink).
Step 4:	Cover the modular connectors with the dust cover.
Step 5A:	Check location of ***Ground bus*** for the next step.

Front View of bypass cabinet (with door open)

Figure 4-2: Location of IFAU-16* MMS PCB Installation (1330-2000kVA)

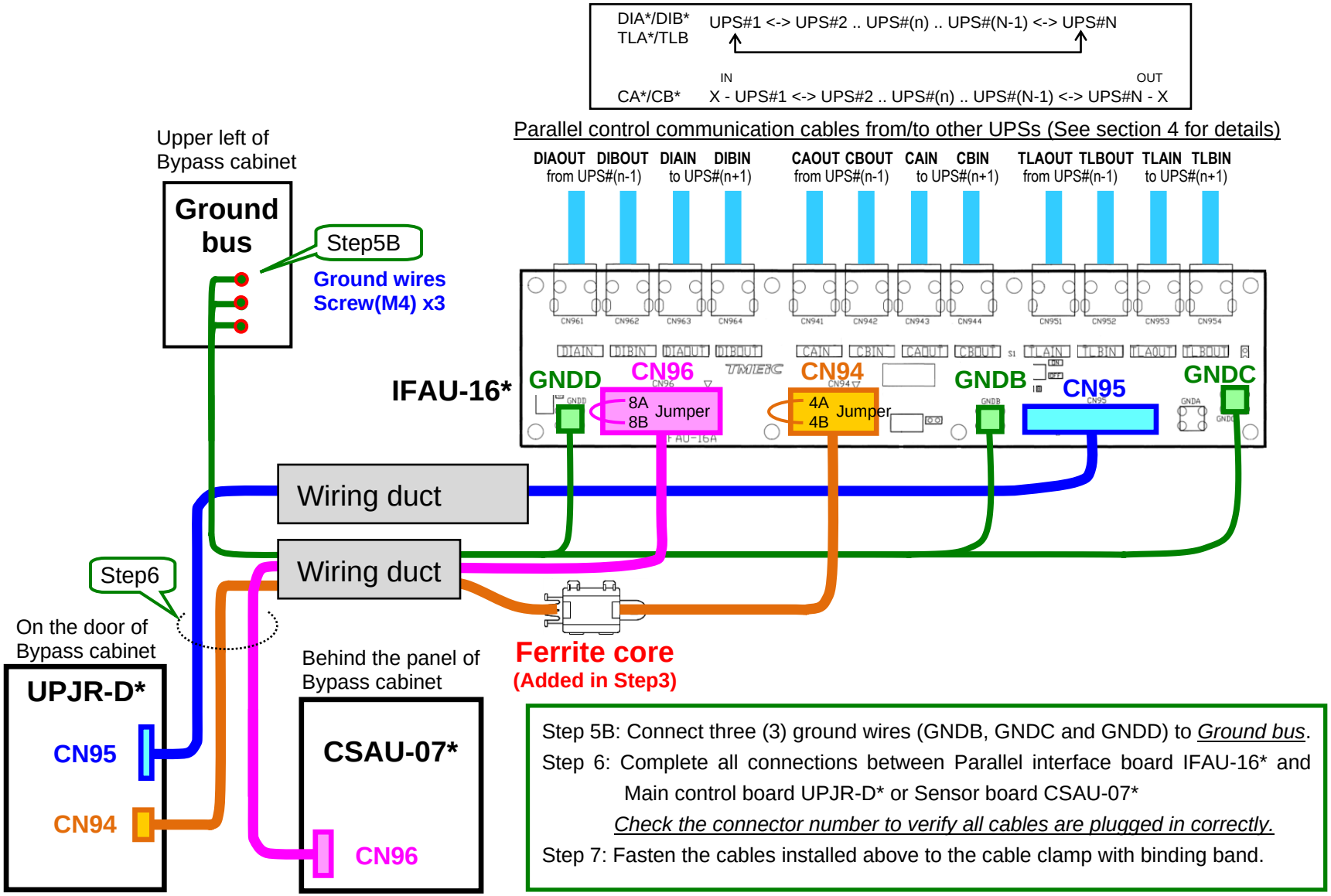


Figure 4-3: Cable Connections Between IFAU-16* and Others

PROHIBIT

IMPORTANT NOTICE

In cases where there are large amounts of slack LAN cables after installation:

- ***Keep cables away from the power conversion circuits and conductors in order to avoid interference in the parallel control communication.***
- ***Do not roll cables as doing so may cause signal interference.***

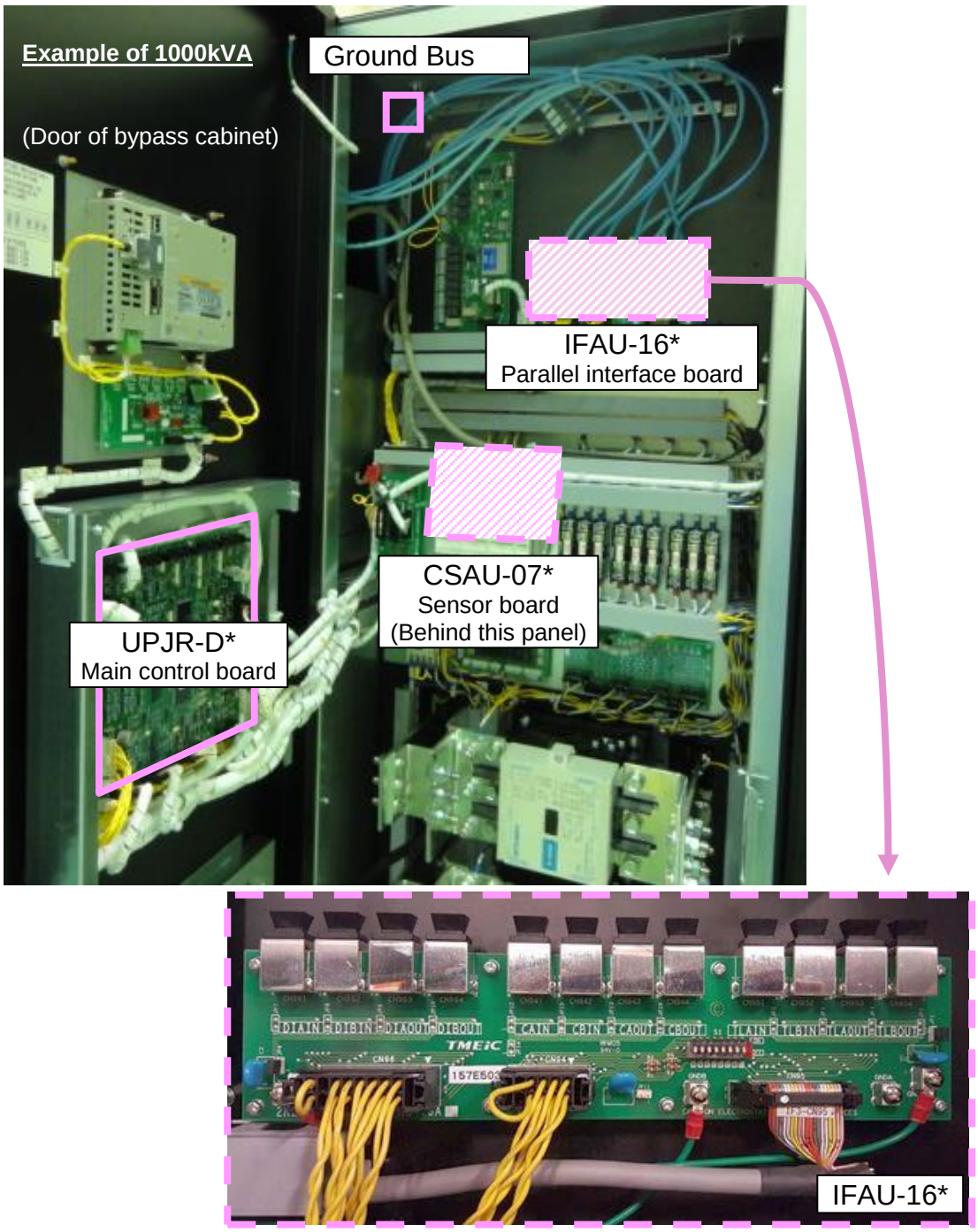


Figure 4-4: Example of the Inside of Bypass Cabinet after Installation (1000kVA)

Step 8: Setup the dip switch on IFAU-16* according to Table 4-1.

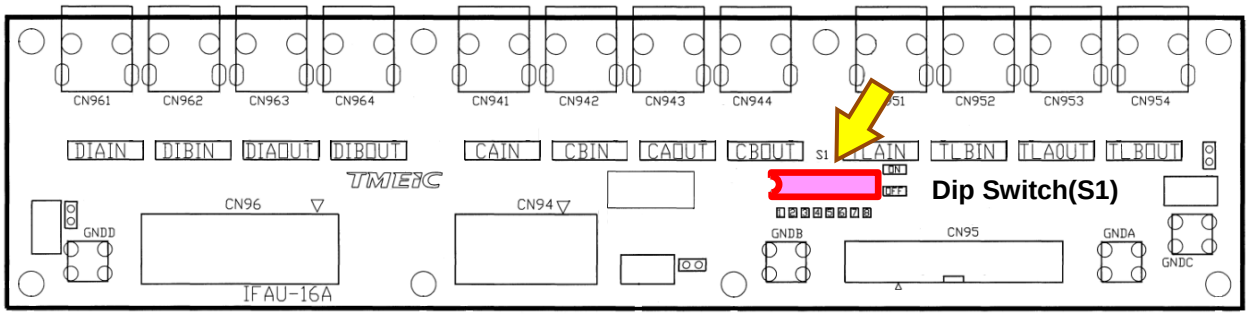
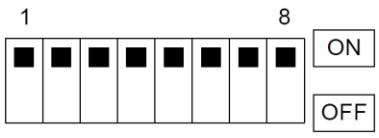


Figure 4-5: Dip Switch Location on Parallel Interface Board (IFAU-16*)

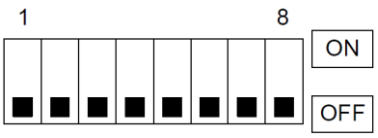
Table 4-1: Dip Switch Setting on Parallel Interface Board (IFAU-16*)

System	No.1 UPS	No.2 UPS	No.3 UPS	No.4 UPS	No.5 UPS	No.6 UPS
2 by MMS	All ON	1 and 2: ON 3 to 8: OFF				
3 by MMS	All ON	All OFF	1 & 2: ON 3 to 8: OFF			
4 by MMS	All ON	All OFF	All OFF	1 & 2: ON 3 to 8: OFF		
5 by MMS	All ON	All OFF	All OFF	All OFF	1 & 2: ON 3 to 8: OFF	
6 by MMS	All ON	All OFF	All OFF	All OFF	All OFF	1 & 2: ON 3 to 8: OFF

UPS#1
1 to 8: ON
(All ON)



UPS#2 ~ UPS#(N-1)
1 to 8: OFF
(All OFF)



UPS#N
1 and 2: ON
3 to 8: OFF

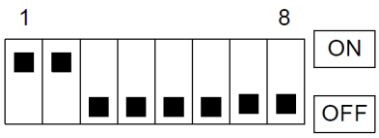


Figure 4-6: Example of Dip Switch Setting

Step 9: Make sure the status of Jumpers on IFAU-16* according to Table 4-2.

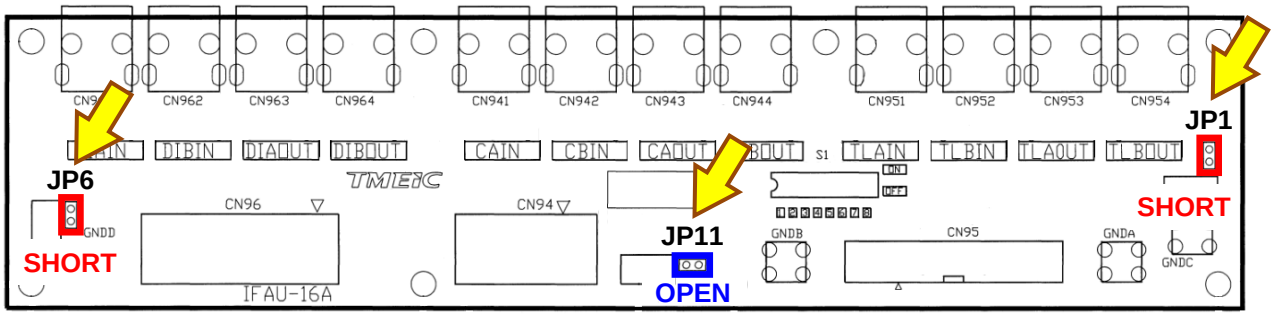


Figure 4-7: Location of Jumpers on Parallel Interface Board(IFAU-16*)

Table 4-2: Status of Jumpers on Parallel Interface Board(IFAU-16*)

#	Device	Status
1	JP1	SHORT
2	JP6	SHORT
3	JP11	OPEN

NOTE	**When in Parallel Operation, the rectifier inputs to all G9000 UPS Systems in the Multi-Module System (MMS)-must be fed from a single source at all times including any operation of Automatic Transfer Switches. All G9000 bypass inputs must also be fed from a single source at all times (not necessarily the same source as the rectifier inputs).**

5 Parallel Operation System Connection

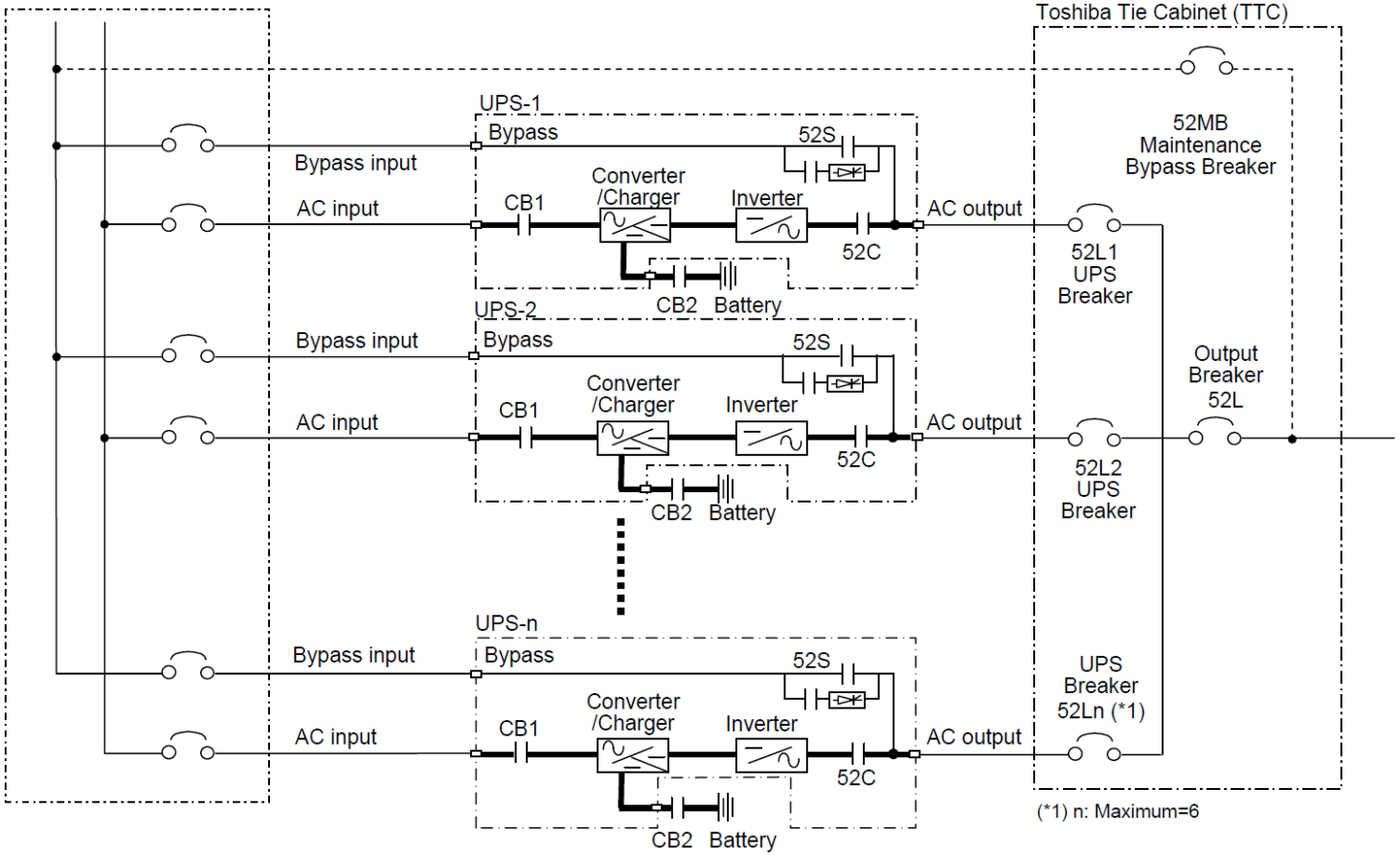


Figure 5-1: Diagram of Power Wire Connections (Parallel Operation System)

NOTE

Use Ethernet STP(Shielded Twisted Pair) Cable (Cat 6 or better) with RJ45 modular connectors for all communication cabling.

Use of UTP (Unshielded Twisted Pair) Cable may cause malfunction.

Total cable length from UPS-1 to UPS-n should be within 100m (330ft).

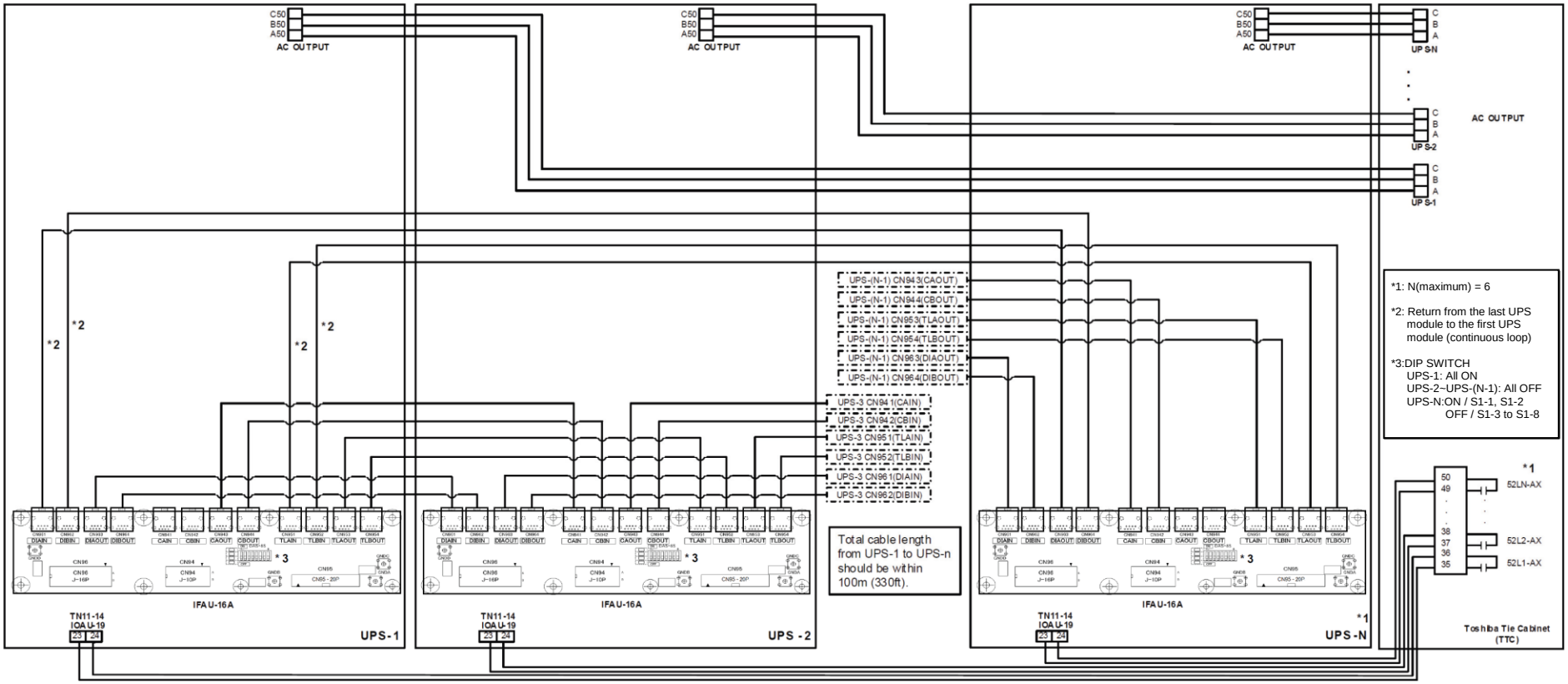


Figure 5-2: Diagram of Power Wire and Control Wire Connection (Parallel Operation System)

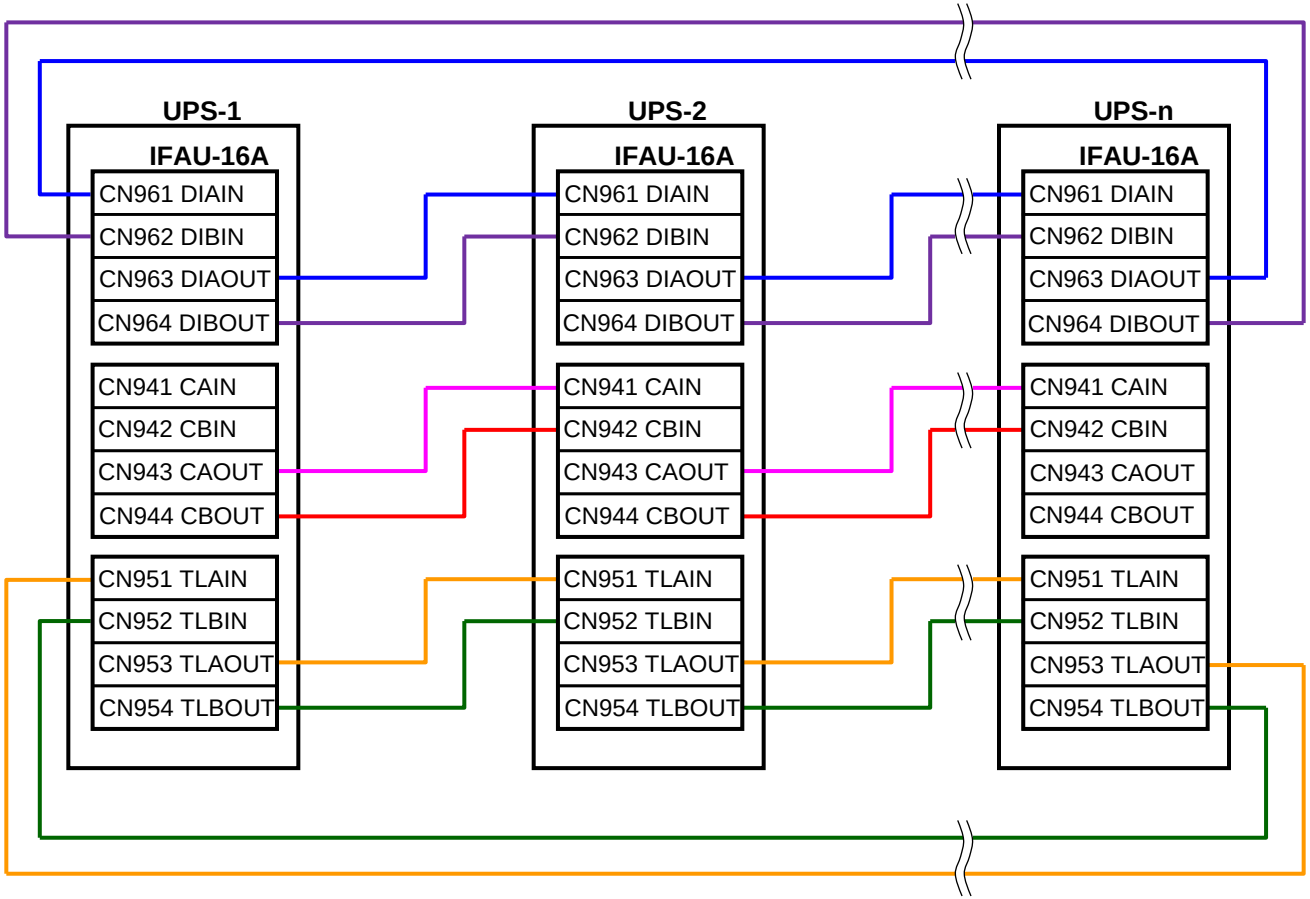


Figure 5-3: UPS Module Parallel Interface Board (IFAU-16*) Interconnections

TOSHIBA

TOSHIBA INTERNATIONAL CORPORATION

SOCIAL INFRASTRUCTURE SYSTEMS GROUP
POWER ELECTRONICS DIVISION

13131 West Little York Rd., Houston, TX 77041
Tel: 855-803-7087 Fax 713-896-5212

US 800/231-1412 Canada 800/872-2192 Mexico 01/800/527-1204

www.toshibaups.com

Printed in Japan