

HAND HELD UNIT (APFC DATA COMMUNICATOR)



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INTRODUCTION

Hand Held Unit is a portable electronic unit. It is used to store logged data from APFC controllers. It can store four months logged data of controllers from site. The captured data is stored into external Flash Memory (Micro SD card) which can store up to 999 controllers' data.

Downloaded data can be fetched to PC from HHU via PC end software.

Provision of Date & Time is also provided, for that RTC (Real time clock) is embedded in the system. It is a battery operated device, which gives 8 hours continuous battery backup and it can also work on mains adaptor of +5V DC. It is having inbuilt lithium-ion battery charger. Battery voltage monitoring is provided with indication of low battery on LCD display. Also LED indication is provided for Battery charging & charging complete.

Additional facility provided by HHU is it can be used as a Firmware downloader.

FEATURES:

1. Downloads four months logged data of Controller (APFC) into Hand Held Unit.
2. Fully Microcontroller based unit.
3. The captured data store into external Flash Memory (Micro SD card) which can store up to 999 controllers' data.
4. Downloaded data can be fetched to PC from HHU via PC end software.
5. HHU can be used as a Firmware Downloader via JTAG Interface.
6. Portable unit.
7. Serial Communication (RS-232) is used for this data transfer, between Controller→ HHU & HHU→PC.
8. Date & Time displayed on LCD display, for this Real Time Clock (RTC) is embedded into system.
9. Battery operated device which gives 8 hours continuous battery backup.
10. Also works on Mains adaptor of +5V DC.
11. Inbuilt Lithium-ion battery charger.
12. Battery voltage monitoring provided with indication of low battery on LCD display. Also LED indication for Battery charging & charging complete.
13. LCD display of 8 character x 2 lines with LED backlight.
14. Separate ON & OFF keys are provided.
15. Five different keys are used
 - UP Key : To scroll in up direction.
 - Down Key: To scroll in Down direction.
 - Left key : To move cursor in Left direction.
 - Right Key : To move cursor in right direction.
 - Enter Key : To enter into Menu Mode.
16. LCD contrast can be changed through external potentiometer.

Electrical Specification:

- | | |
|-------------------------------------|----------------------------|
| 1. Operating Supply through adaptor | : +5Vdc. |
| 2. Battery voltage | : 3.7V - 4.2Vdc, 900mAh. |
| 3. Battery charging current | : 100 mA (+/- 5mA) |
| 4. Battery Type | : With In-built protection |
| 5. Battery Make | : Li-ion Cylindrical |

Mechanical Specification:

- i) 1. Plastic Enclosure
 - (a) Color : Black
 - (b) Dimensions : 155 X 85 X 30mm
- ii) 2. LCD slot on Enclosure : 57 X 25mm

Environmental Specification:

- 1. Temp Range : 0 - 55°C
- 2. Relative Humidity : 10 - 80%

FRONT FASCIA

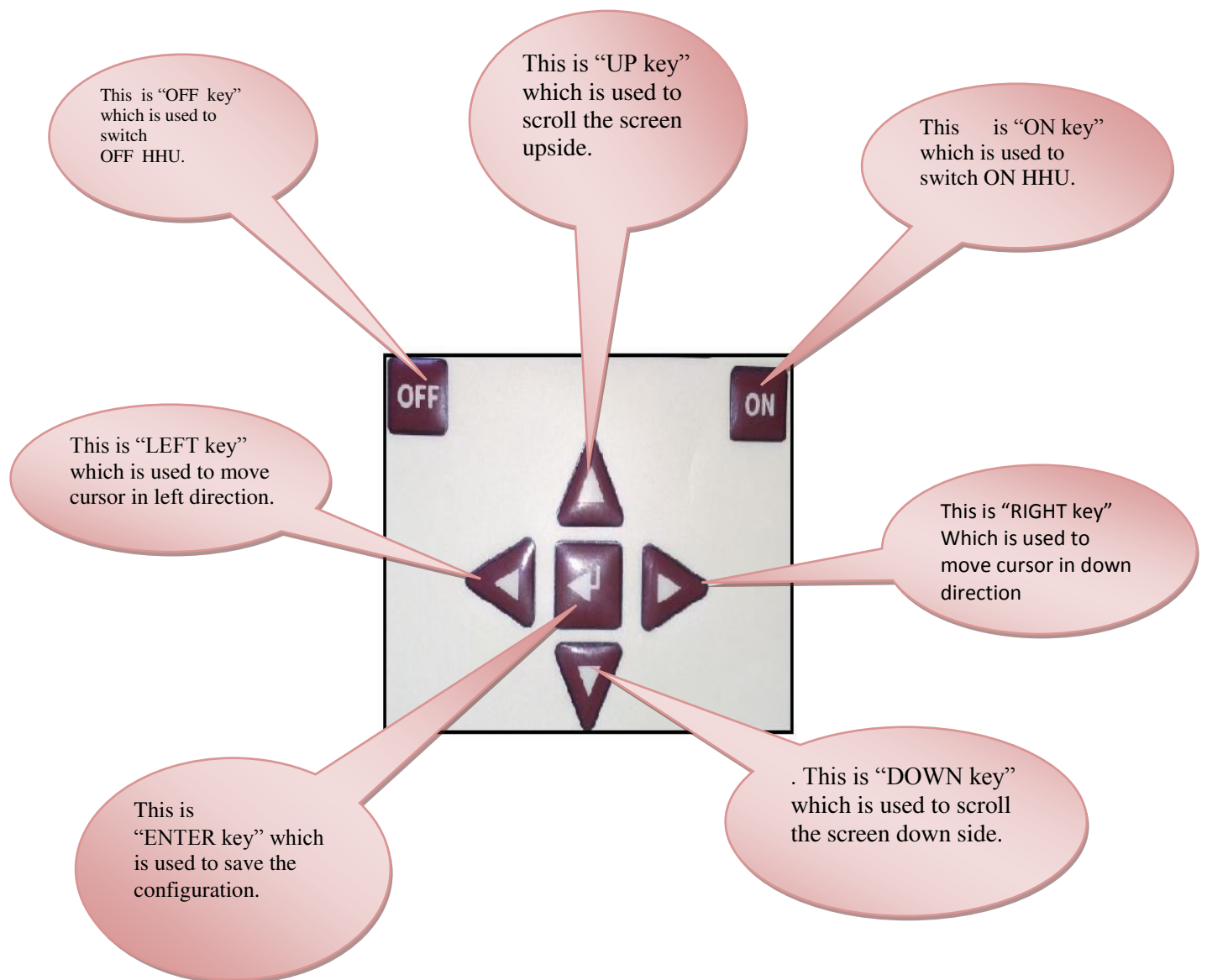


LED INDICATION

A single LED is provided in front of Unit to indicate charging status of Lithium-ion battery.

LED glows when unit is in charging mode, it charges battery when +5V adaptor is connected to HHU. If battery get fully charged LED stops glowing.

KEYPAD DETAILS



INSTALLATION DETAILS

For Installation we require:-

- HHU
- Cross Cable(HHU to APFC)
- Serial Cable(PC to HHU)

HHU is housed in a Plastic ABS cabinet with a 9-pin D type Female connector mounted on one side of HHU for uploading data from APFC & downloading it to PC and a DC power jack on other side for connecting adaptor.

3 Pin cross cable is required to upload data from APFC controller.



HHU is connected to PC using a serial cable for data downloading.



If battery is not sufficient to power ON the Unit or battery is low then connect DC adaptor, through DC power Jack which is at right corner of the Unit.

MENU DESCRIPTION

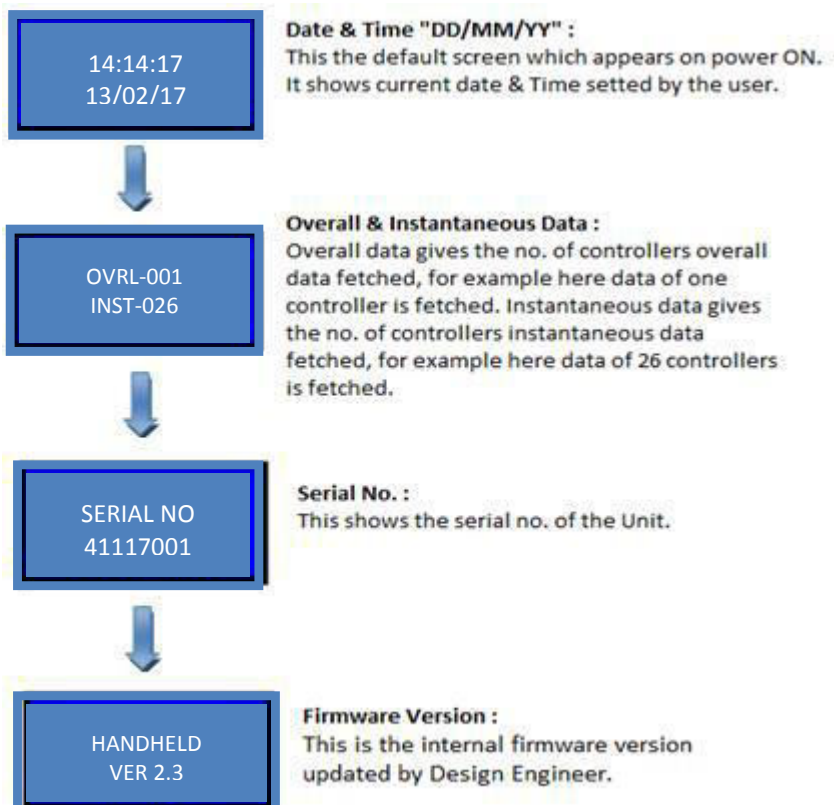
- 1) Power ON screen shows Company name & version, It appears for few seconds when Power On the unit.



- 2) Power On screen vanishes in few seconds then default Screen comes which shows Real Time Clock which includes Date & Time displayed on Front display of 8 character x 2 lines LCD screen.

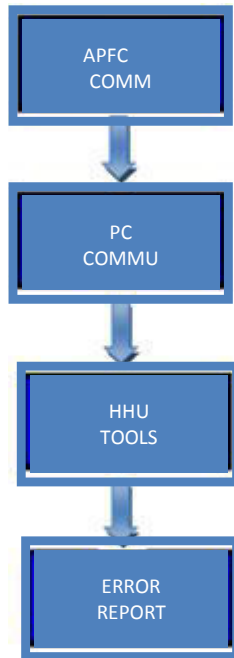


- 3) On default screen by pressing Up-Down keys, some non-editable parameters appear which are as below:-



4) MAIN MENU STRUCTURE :

By pressing ENTER key some Editable MENU appears, which are as follows:-



1) **APFC Communication -**

This mode comes in picture when Communication is established in between APFC & HHU, when data is to be upload from APFC.

In APFC communication after enter Key is pressed following MENU is shown on the display.

Overall Data → TAS Controller → Overall Data → GET ID

a) Overall Data:

Overall Data is used to fetch overall data of APFC.

Data includes

This section fetches the following parameters

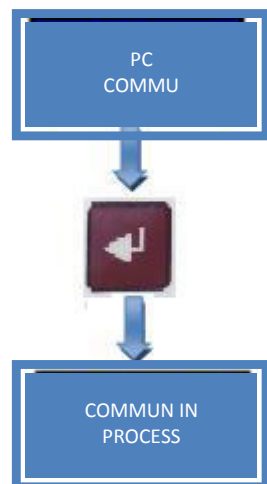
Interval Data, Event Data, instant data, parameters value & Utilization parameters

For fetching overall data, enter in APFC communication mode in main menu structure →
i) overall data → Get ID.

After entering in GET ID, Panel ID of the controller is fetched and downloading process starts. After downloading is completed, message of completion is displayed.

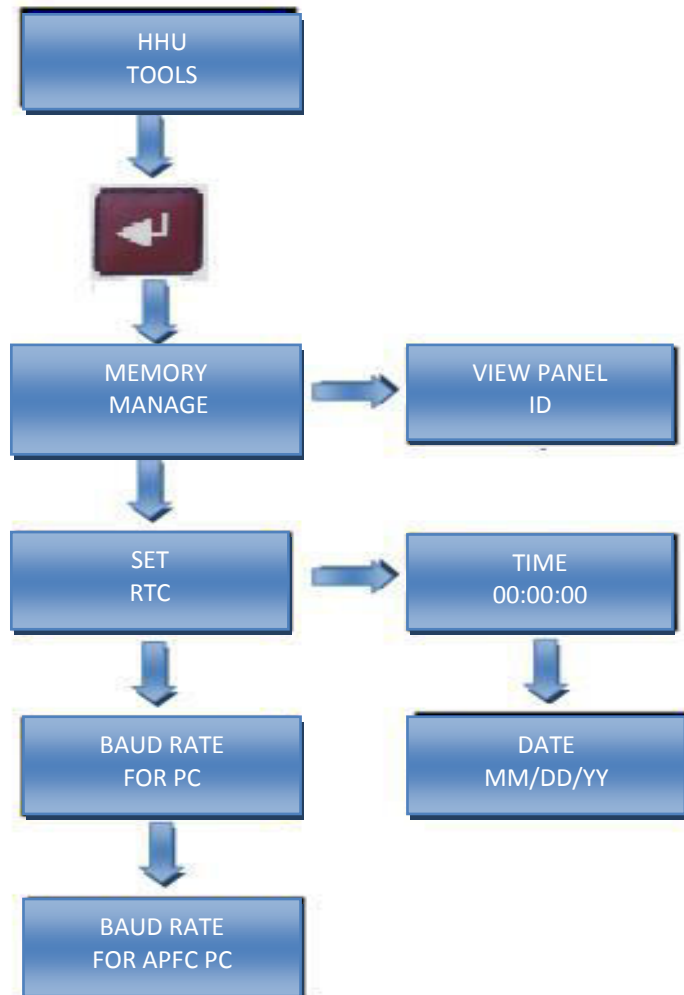
2) PC communication:

PC communication mode is utilized when data is uploaded to PC from HHU. Entering in this mode allows uploading of data into PC.

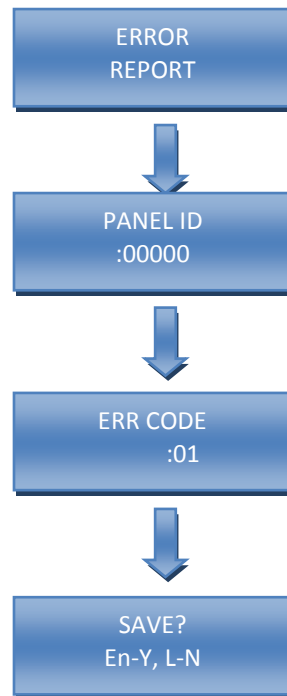


3) HHU Tools:

This mode allows setting of RTC, selection of baud rate, memory manage.



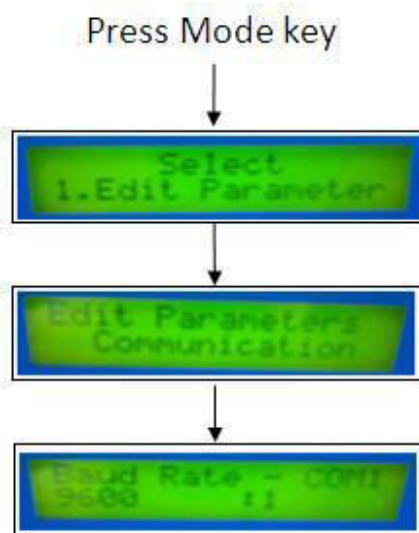
a) ERROR REPORT



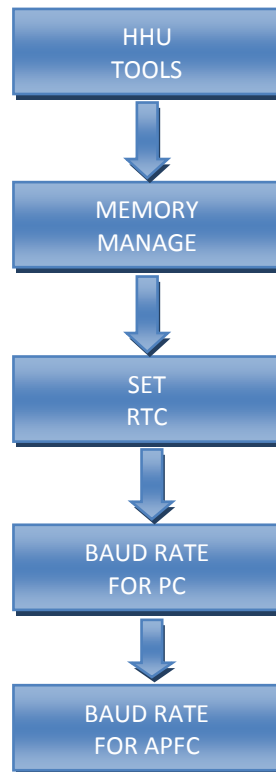
Configuration of APFC & HHU to download data into HHU

1. Connect APFC and HHU using a 3-pin cross cable.
2. Select baud rate for APFC as given below:-

Press "Mode key" → "Edit Parameters" → "Communication" → Select "Com1 Communication Baud rate" and edit it.



3. Then select baud rate for HHU.



Enter in this mode and select appropriate baud rate for communication.

4. Baud rate of controller and HHU must be same otherwise “communication error” occurs.

- For fetching instant data, enter in APFC communication mode in main menu structure → instant data → Get ID. Same process is repeated with the instantaneous data, Panel ID is fetched and then downloading process starts.

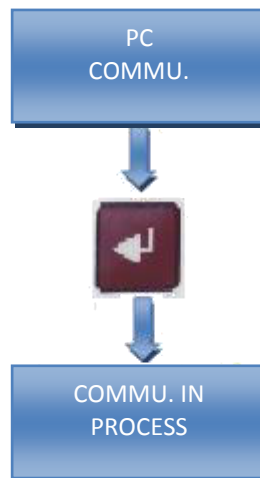
Configuration of HHU & PC to upload data into PC:

1) Baud rate setting for HHU & PC:

- For uploading data into PC, firstly set baud rate for both PC & HHU.
- Baud rate setting for HHU is shown in the previous section. (refer page no. 15)
- Baud rate of PC & HHU must be same for proper communication.

2) HHU Setting:

- While uploading data from HHU into PC, enter into PC Communication mode of HHU as given below.
- Communication is established between HHU & PC only when entered in this particular mode.



Error Code List:

0029 - If no ID is received from JTAG.

Solution: Check/replace FRC Cable & Ensure power supply is given to APFC.

0030 – Flash erase failure.

Solution: FRC cable problem.

0031 – Blank check failure.

Solution: FRC cable problem.

0032 - Write failure.

Solution: FRC cable problem.

0033 - Blank check failure.

Solution: FRC cable problem.

0035 – No response from Target while at write, read operation.

Solution: restart HHU.

0036 – Checksum fail.

Solution: FRC cable problem, MMC Error or may be corrupt.

0037 – Lock Flash fail.

Solution: FRC cable problem.

0040 – Communication fails at erase.

Solution Connect FRC Cable between APFC & HHU.

0041 – Communication fails at blank check.

Solution Connect FRC Cable between APFC & HHU.

0042 –Communication fails at write operation.

Solution Connect FRC Cable between APFC & HHU.

0050 – Serial communication error.

Solution: Connect Serial Cable between APFC & HHU, match baud rate of APFC & HHU
(set baud rate of both devices at same value.)

0051 – TAS identification failure.

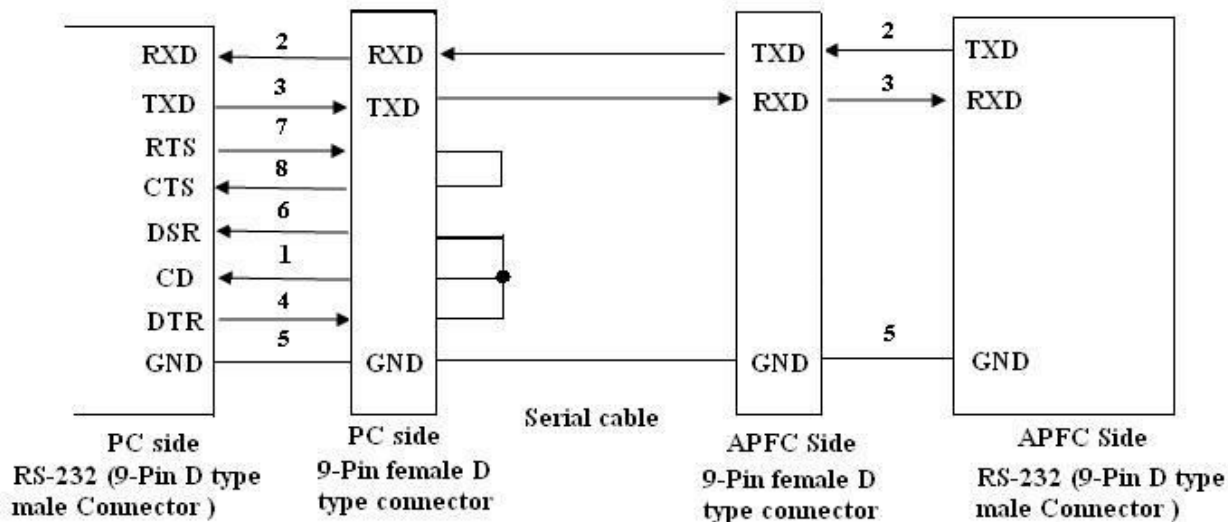
Solution: Check baud rate and serial cable.

Troubleshooting Tips

The causes of communication failure during data downloading of HHU from APFC are as follows:

1. Ensure that the **Baud Rate** of Hand Held Unit & APFC controller is same for communication.
2. **Cross cable** must be used for communicating between HHU & APFC, otherwise communication fails. Cross cable assembly made as TXD (Pin 2) of one terminal is get connected to RXD (Pin 3) of another terminal.
3. While connecting these devices to each other, if cable length is large, then select lower Baud rate like 9600bps or 4800bps.
4. If above conditions are checked & still communication failure occurs then check the DB-9 connectors wire connections whether soldering is proper or not.

DB9 connectors pin out for both HHU & APFC are shown below.



The above wiring diagram of the RS-232 Serial Communication Cable which is meant for communication between:

- 1] PC Serial Port and TNEB APFC Unit.
- 2] PC Serial Port and the TAS HHU Unit.

For your connecting HHU to the TNEB APFC Unit, basically the same connections towards the PC Side are valid; however, in the Connector End towards the TNEB APFC Unit, you need to **interchange** the wires for 9-Pin "D" Connectors Pins 2 and Pin 3.

Also please note that if you are using a Laptop, instead of Desktop PC, then, most Laptops now a day do not have in-built Serial RS-232 Port.

These Laptops now have USB Port and then, some user make use of a USB-to-RS-232 Converter Adapter to effectively get RS-232 Interface ability via USB.

The USB is software configurable and NOT all USB Ports successfully handle the RS-232 Converter / Adapter.

Therefore, in order to avoid the compatibility issues, please **avoid using USB Port** and use the RS-232 directly available from the required computer.

5. Also check the connections are tightly connected on both the ends or not, both DB9 connectors should be screwed well so that there is no possibility of loose connection.
6. Different error codes occur at display screens of HHU are given below with its causes.

Error code listing:

- a) **“ERROR 001”** - Initialization of SD card failure.(SD card not supported or not connected)
 - b) **“ERROR 002”** – SD card not responding.
 - c) **“ERROR 003”** – SD card working but unable to read FAT entries
 - d) **“ERROR 004”** – Communication error occurs because of low battery.
 - e) **“ERROR 005”** - Not occurs in system used for testing purpose only
 - f) **“ERROR 006”** - Not occurs in system used for testing purpose only
 - g) **“ERROR 007”** – Checksum error.
 - h) **“ERROR 008”** – Wrong address given to card.
 - i) **“ERROR 009”** - Communication failure.
7. Another reason causes communication failure, if battery of Hand Held Unit is low & shows on LCD display then there is possibility of data corruption. To avoid this, communication is restricted in this case.