



matrixProtocol Port Keyboard Control

Universal Protocol

Legal Information

About this Document

- This Document includes instructions for using and managing the Product. Pictures, charts, images and all other information hereinafter are for description and explanation only.
- The information contained in the Document is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version of the Document at the Hikvision website (<https://www.hikvision.com>). Unless otherwise agreed, Hangzhou Hikvision Digital Technology Co., Ltd. or its affiliates (hereinafter referred to as "Hikvision") makes no warranties, express or implied.
- Please use the Document with the guidance and assistance of professionals trained in supporting the Product.

About this Product

This product can only enjoy the after-sales service support in the country or region where the purchase is made.

Acknowledgment of Intellectual Property Rights

- Hikvision owns the copyrights and/or patents related to the technology embodied in the Products described in this Document, which may include licenses obtained from third parties.
- Any part of the Document, including text, pictures, graphics, etc., belongs to Hikvision. No part of this Document may be excerpted, copied, translated, or modified in whole or in part by any means without written permission.
- **HIKVISION** and other Hikvision's trademarks and logos are the properties of Hikvision in various jurisdictions.
- Other trademarks and logos mentioned are the properties of their respective owners.
- **HDMI**™ The terms HDMI and HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc. in the United States and other countries.

LEGAL DISCLAIMER

- TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, THIS DOCUMENT AND THE PRODUCT DESCRIBED, WITH ITS HARDWARE, SOFTWARE AND FIRMWARE, ARE PROVIDED "AS IS" AND "WITH ALL FAULTS AND ERRORS". HIKVISION MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY, SATISFACTORY QUALITY, OR FITNESS FOR A PARTICULAR PURPOSE. THE USE OF THE PRODUCT BY YOU IS AT YOUR OWN RISK. IN NO EVENT WILL HIKVISION BE LIABLE TO YOU FOR ANY SPECIAL, CONSEQUENTIAL, INCIDENTAL, OR INDIRECT DAMAGES, INCLUDING, AMONG OTHERS, DAMAGES FOR LOSS OF BUSINESS PROFITS, BUSINESS INTERRUPTION, OR LOSS OF DATA, CORRUPTION OF SYSTEMS, OR LOSS OF DOCUMENTATION, WHETHER BASED ON BREACH OF CONTRACT, TORT (INCLUDING NEGLIGENCE), PRODUCT LIABILITY, OR OTHERWISE, IN CONNECTION WITH THE USE OF THE PRODUCT, EVEN IF HIKVISION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES OR LOSS.
- YOU ACKNOWLEDGE THAT THE NATURE OF THE INTERNET PROVIDES FOR INHERENT SECURITY RISKS, AND

HIKVISION SHALL NOT TAKE ANY RESPONSIBILITIES FOR ABNORMAL OPERATION, PRIVACY LEAKAGE OR OTHER DAMAGES RESULTING FROM CYBER-ATTACK, HACKER ATTACK, VIRUS INFECTION, OR OTHER INTERNET SECURITY RISKS; HOWEVER, HIKVISION WILL PROVIDE TIMELY TECHNICAL SUPPORT IF REQUIRED.

- YOU AGREE TO USE THIS PRODUCT IN COMPLIANCE WITH ALL APPLICABLE LAWS, AND YOU ARE SOLELY RESPONSIBLE FOR ENSURING THAT YOUR USE CONFORMS TO THE APPLICABLE LAW. ESPECIALLY, YOU ARE RESPONSIBLE, FOR USING THIS PRODUCT IN A MANNER THAT DOES NOT INFRINGE ON THE RIGHTS OF THIRD PARTIES, INCLUDING WITHOUT LIMITATION, RIGHTS OF PUBLICITY, INTELLECTUAL PROPERTY RIGHTS, OR DATA PROTECTION AND OTHER PRIVACY RIGHTS. YOU SHALL NOT USE THIS PRODUCT FOR ANY PROHIBITED END-USES, INCLUDING THE DEVELOPMENT OR PRODUCTION OF WEAPONS OF MASS DESTRUCTION, THE DEVELOPMENT OR PRODUCTION OF CHEMICAL OR BIOLOGICAL WEAPONS, ANY ACTIVITIES IN THE CONTEXT RELATED TO ANY NUCLEAR EXPLOSIVE OR UNSAFE NUCLEAR FUEL-CYCLE, OR IN SUPPORT OF HUMAN RIGHTS ABUSES.
- IN THE EVENT OF ANY CONFLICTS BETWEEN THIS DOCUMENT AND THE APPLICABLE LAW, THE LATTER PREVAILS.

© Hangzhou Hikvision Digital Technology Co., Ltd. All rights reserved.

TABLE OF CONTENTS

Chapter 1 Introduction	1
1.1 Background	1
1.2 Terms and Abbreviations	1
1.3 References	1
Chapter 2 Protocol Overview	1
Chapter 3 Protocol Item Description	1
3.1 Log In (Command Code: 0x01)	1
3.1.1 Command Format	1
3.1.2 Command Examples	1
3.2 Log Out (Command Code: 0x02)	2
3.2.1 Command Format	2
3.2.2 Command Examples	2
3.3 Single-Channel Switch (Command Code: 0x03)	2
3.3.1 Command Format	2
3.3.2 Command Example	2
3.4 Window Division (Command Code: 0x07)	2
3.4.1 Command Format	2
3.4.2 Command Example	3
3.5 Add Users (Command Code: 0x08)	3
3.5.1 Command Format	3
3.5.2 Command Example	3
3.6 Delete Users (Command Code: 0x09)	3
3.6.1 Command Format	3
3.6.2 Command Example	3
3.7 Call the Scene (Command Code: 0x0b)	4
3.7.1 Command Format	4
3.7.2 Command Example	4
3.8 Sub-window Switch (Command Code: 0x0c)	4
3.8.1 Command Format	4
3.8.2 Command Example	4
3.9 Single-channel Switch (Command Code: 0x12, Compatible with Multiple Smart Walls)	4
3.9.1 Command Format	4
3.9.2 Command Example	4
3.10 Window Division (Command Code: 0x14, Compatible with Multiple Smart Walls)	5
3.10.1 Command Format	5
3.10.2 Command Example	5
3.11 Switch Scene (Command Code: 0x16, Compatible with Multiple Smart Walls)	5
3.11.1 Command Format	5
3.11.2 Command Example	5
3.12 Sub-window Switch (Command Code: 0x17, Compatible with Multiple Smart Walls)	6

3.12.1 Command Format	6
3.12.2 Command Example	6
3.13 Switch Plan (Command Code: 0x1C, Compatible with Multiple Smart Walls).....	6
3.13.1 Command Format	6
3.13.2 Command Example	6
3.14 Window Roam Zooming Out (Command Code: 0x1D, Compatible With Multiple Smart Walls)	7
3.14.1 Command Format	7
3.14.2 Command Example	7
Chapter 4 Revision Record.....	8

Chapter 1 Introduction

1.1 Background

Conflicts exist in the protocols of port keyboard features developed by Display and Control Department. To decrease potential troubles for customers and follow the rules of compatibility with released products, protocols of unreleased products are revised and this Protocol is developed as the standard.

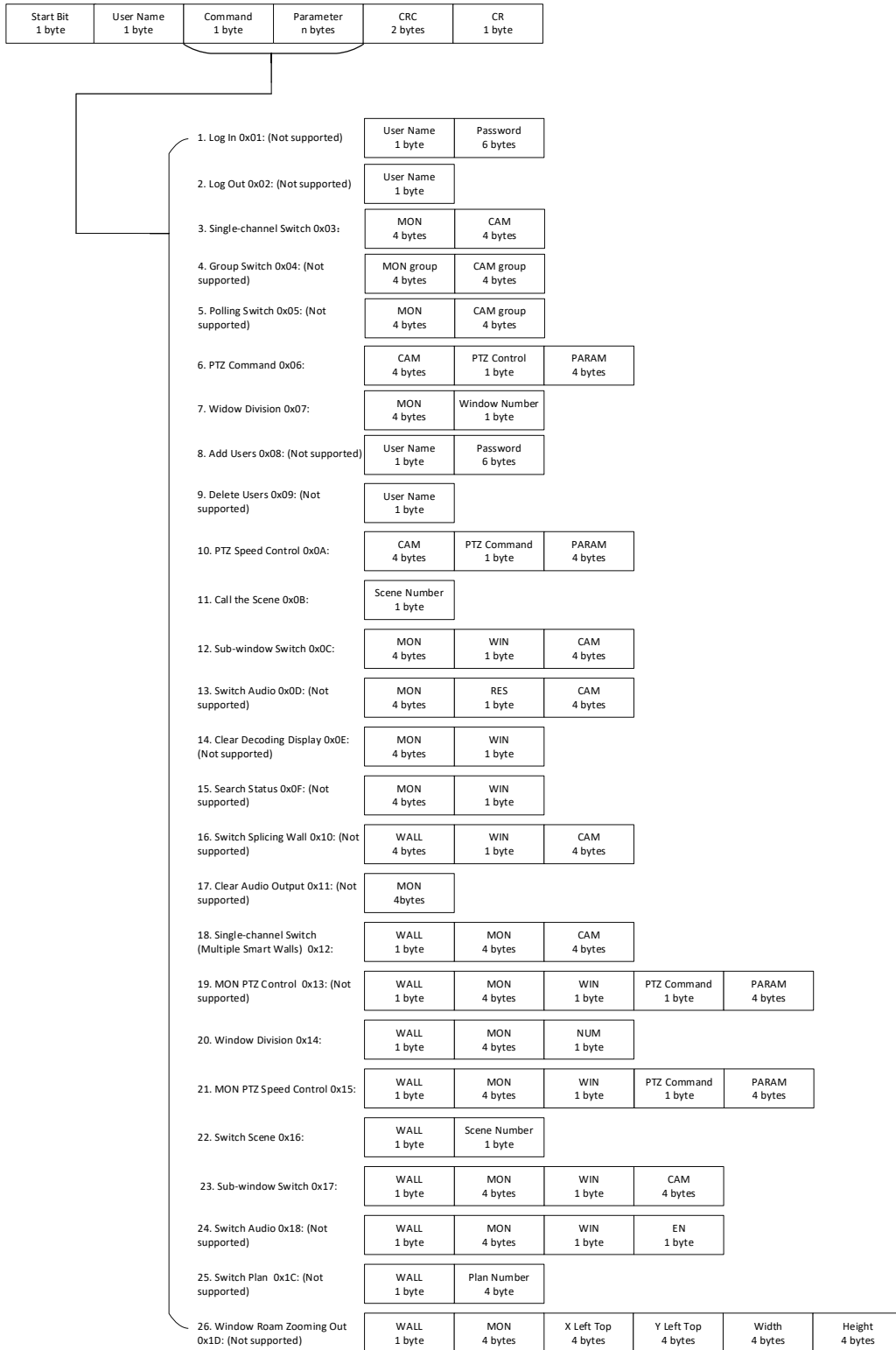
1.2 Terms and Abbreviations

Term/Abbreviation	Description
CAM	Input signal number of camera, got from configuration tools.
MON	Monitor number, decided by the order of opening window.
WIN	Sub-window number.
CRC	Parity bit, consists of two bytes.
CR	Terminator, consists of one byte.
WALL	Smart wall number, exists in the protocols supporting multiple smart walls.

1.3 References

Port Keyboard Control Protocol V2.0.0

Chapter 2 Protocol Overview



Chapter 3 Protocol Item Description

For the command format of multi-function video center, the start bit is 0x23 (#), terminator is carriage return CR (0x0D), and the user name is one digit and takes up one byte. Users need to log in to the device before sending commands, and set the user name as 0. All port commands contain this user name. Each command code takes up one byte. For all command codes and corresponding parameter formats, see Protocol Overview. CRC is parity code. This code is the sum of characters except the start bit, CRC, and terminators.

As the privilege user of port protocol command, User 0 needs to log in to the device as privilege user before sending any command. You need to add another user for operation. For how to log in as a privilege user and add users, see the first and the eighth commands.

3.1 Log In (Command Code: 0x01)

3.1.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	User Name 1 byte	Password 6 bytes	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	---------------------	---------------------	----------------	--------------

The first user name of this command has to be 0. The second user name is the one you used when logged in, and it is one digit, taking up one byte (i.e. if the user name is 12, send 0x0C.), and its password takes up six bytes as ASCII code (i.e. if the password is 123456, send 0x31 0x32 0x33 0x34 0x35 0x36); both 0x01 and 0xff are special users who can send commands without logging in. >=0xfe is an isolated user and cannot be established.

3.1.2 Command Examples

Log in as a privilege user:

0x23 0x00 0x01 0x00 0x31 0x31 0x31 0x31 0x31 0x31 0x01 0x27 0x0d

Log in as a common user:

(User name: 0x33)

0x23 0x00 0x01 0x33 0x31 0x32 0x33 0x34 0x35 0x36 0x01 0x69 0x0d

3.2 Log Out (Command Code: 0x02)

3.2.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	User Name 1 byte	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	---------------------	----------------	--------------

The first user name of this command has to be the one used to log in before sending any command, and the second user name has to be the one used to log out. These two user names must be consistent.

3.2.2 Command Examples

A privilege user (User 0x00) logs out: 0x23 0x00 0x02 0x00 0x00 0x02 0x0d

3.3 Single-Channel Switch (Command Code: 0x03)

3.3.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	MON 4 bytes	CAM 4 bytes	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	----------------	----------------	----------------	--------------

Single-channel Switch command is sent to switch an input image to be displayed on another monitor. MON is the monitor number.

CAM is the input signal number of analog input and IPC. MON and CAM must be configured to the device in advance via configuration file.

3.3.2 Command Example

Log in as User 0x0d to switch CAM 6 to MON 1.

0x23 0x0d 0x03 0x00 0x00 0x00 0x01 0x00 0x00 0x00 0x06 0x00 0x17 0x0d

3.4 Window Division (Command Code: 0x07)

3.4.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	MON 4 bytes	Window Number 1 byte	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	----------------	-------------------------	----------------	--------------

Window Division command is sent to divide windows of BNC/DVI/VGA/HDMI input. MON is the monitor number on the device, and the number of windows is the number of divisions on the display.

3.4.2 Command Example

Log in as User 0x33 to divide MON (Monitor 1) into four windows.

0x23 0x33 0x07 0x00 0x00 0x00 0x01 0x04 0x00 0x3f 0x0d

3.5 Add Users (Command Code: 0x08)

3.5.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	User Name 1 byte	Password 6 bytes	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	---------------------	---------------------	----------------	--------------

Add Users command is sent to add port command users to the device and change password.

The second user name is the one to be added. If this user name exists, then change its password.

This command can only be sent when log in as a privilege user, i.e. the first user name must be a privilege user, and the privilege user name is 0.

3.5.2 Command Example

Log in as a privilege user to add User 0x33, and the password is 123456.

0x23 0x00 0x08 0x33 0x31 0x32 0x33 0x34 0x35 0x36 0x01 0x70 0x0d

3.6 Delete Users (Command Code: 0x09)

3.6.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	User Name 1 byte	CRC 2 bytes	CR 1byte
---------------------	---------------------	-------------------	---------------------	----------------	-------------

Delete Users command is sent to delete port command users of the device. The second user name in this command is to specify the user to be deleted. This command can only be sent when log in as a privilege user.

3.6.2 Command Example

Log in as a privilege user to delete User 0x33:

0x23 0x00 0x09 0x33 0x00 0x3c 0x0d

3.7 Call the Scene (Command Code: 0x0b)

3.7.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	Scene Number 1 byte	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	------------------------	----------------	--------------

Scene number range: 1 ~ 16. The exact number depends on the device.

3.7.2 Command Example

Call Scene 1:

0x23 0x01 0x0b 0x01 0x00 0x0d 0x0d

3.8 Sub-window Switch (Command Code: 0x0c)

3.8.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	MON 4 bytes	WIN 1 byte	CAM 4 bytes	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	----------------	---------------	----------------	----------------	--------------

3.8.2 Command Example

Log in as User 0x1 to switch CAM 2 to sub-window 3 of Monitor 1.

0x23 0x01 0x0c 0x00 0x00 0x00 0x01 0x03 0x00 0x00 0x00 0x02 0x00 0x13 0x0d

3.9 Single-channel Switch (Command Code: 0x12, Compatible with Multiple Smart Walls)

3.9.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	WALL 1 byte	MON 4 bytes	CAM 4 bytes	CRC 2 bytes	CR 1byte
---------------------	---------------------	-------------------	----------------	----------------	----------------	----------------	-------------

Single-channel switch with smart wall number.

Command code: 0x12

WALL: smart wall number (WALL 1 by default if not assigned), MON: monitor number, CAM: input signal number of camera.

3.9.2 Command Example

Log in as User 0x01 to switch CAM 1 to MON 4.

0x23 0x01 0x12 0x01 0x00 0x00 0x00 0x04 0x00 0x00 0x00 0x01 0x00 0x19 0x0d

3.10 Window Division (Command Code: 0x14, Compatible with Multiple Smart Walls)

3.10.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	WALL 1 byte	MON 4 bytes	NUM 1 byte	CRC 2 bytes	CR 1byte
---------------------	---------------------	-------------------	----------------	----------------	---------------	----------------	-------------

Window Division command is sent to divide windows of BNC/DVI/VGA/HDMI output.

Command Code: 0x14

WALL: Smart wall number

MON: Monitor number

NUM: Number of windows after division (1, 4, 6, 8, 9, 16, or 25. 1 refers to single window status, and the specified returned value is subject to the device.)

3.10.2 Command Example

Log in as User 0x01 to divide MON 4 and 16 of WALL 1.

0x23 0x01 0x14 0x01 0x00 0x00 0x00 0x04 0x10 0x00 0x2a 0x0d

3.11 Switch Scene (Command Code: 0x16, Compatible with Multiple Smart Walls)

3.11.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	WALL 1 byte	Scene Number 1 byte	CRC 2 bytes	CR 1byte
---------------------	---------------------	-------------------	----------------	------------------------	----------------	-------------

Switch the scene with smart wall number.

3.11.2 Command Example

Log in as User 0x01 to switch Scene 4 to WALL 1.

0x23 0x01 0x16 0x01 0x04 0x00 0x1c 0x0d

3.12 Sub-window Switch (Command Code: 0x17, Compatible with Multiple Smart Walls)

3.12.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	WALL 1 byte	MON 4 bytes	WIN 1 byte	CAM 4 bytes	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	----------------	----------------	---------------	----------------	----------------	--------------

Switch sub-windows with smart wall number.

Command code: 0x17

WALL: Smart wall number (WALL 1 by default if not assigned).

MON: Monitor number.

WIN: Sub-window number.

CAM: Input signal number of camera.

3.12.2 Command Example

Log in as User 1 to switch CAM 2 to sub-window 1 of MON 4 on WALL 1.

0x23 0x01 0x17 0x01 0x00 0x00 0x00 0x04 0x01 0x00 0x00 0x00 0x02 0x00 0x20 0x0d

3.13 Switch Plan (Command Code: 0x1C, Compatible with Multiple Smart Walls)

3.13.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	WALL 1 byte	Plan Number 4 byte	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	----------------	-----------------------	----------------	--------------

WALL: Smart wall number (range: 1 ~ 6).

Plan number: 1 ~ Max. (Per smart wall. The maximum value depends on the device.)

If the plan number is 0, the plan of current smart wall will be stopped.

3.13.2 Command Example

Log in as User 0x01 to switch Plan 4 to WALL 1.

0x23 0x01 0x1c 0x01 0x00 0x00 0x00 0x04 0x00 0x22 0x0d

3.14 Window Roam Zooming Out (Command Code: 0x1D, Compatible With Multiple Smart Walls)

3.14.1 Command Format

Start Bit 1 byte	User Name 1 byte	Command 1 byte	WALL 1 byte	MON 4 bytes	X Left Top 4 bytes	Y Left Top 4 bytes	Width 4 bytes	Height 4 bytes	CRC 2 bytes	CR 1 byte
---------------------	---------------------	-------------------	----------------	----------------	-----------------------	-----------------------	------------------	-------------------	----------------	--------------

WALL: Smart wall number.

MON: Monitor number.

XleftTop: The x-coordinate of the upper-left corner of the window.

YleftTop: The y-coordinate of the upper-left corner of the window.

Width: Width of the window.

Height: Height of the window.

Note: A single video wall of a device supports LED mode or LCD mode, and does not support the two modes at the same time.

In LCD mode, normalized coordinates are applied and every single output is 1920×1920 .

In LED mode, resolution coordinates are applied and every single output is the corresponding resolution.

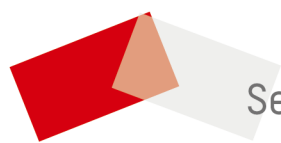
3.14.2 Command Example

Log in as User 0x33 to zoom out MON 1 on WALL 1 to 960×960 and set its position as (5760,0).

0x23 0x33 0x1D 0x01 0x00 0x00 0x00 0x01 0x00 0x00 0x16 0x80 0x00 0x00 0x00 0x00 0x00
0x03 0xc0 0x00 0x00 0x03 0xc0 0x02 0x6e 0x0d

Chapter 4 Revision Record

No.	Date of Revision	Revised By	Content	Related Products
1	1/2/2018	Wang Jianan	Unify port keyboard format, and add Switch Plan and Window Roam Zooming Out commands.	C20N_V1.0.0, B21_V1.4
2	1/16/2018	Wang Jianan	Revise Switch Plan and Window Roam Zooming Out commands.	C20N_V1.0.0, B21_V1.4
3	1/22/2018	Wang Jianan	Correct errors in the Protocol.	



See Far, Go Further