

## Quintech SRR Series Protocol v1.21

Rev G, 10/24/06

This document specifies a common command protocol that can be used to control a Quintech SRR Series Switch from a computer.

### Command Summary

This list gives the commands defined in Protocol 1.21.

- E** Ethernet. Various commands to set Ethernet parameters and control access.
- K** Keypad. Various commands to control access to the front panel keypad.
- Q** Query Path. Polls for the current path.
- R** Reset system.
- S** Set a Crosspoint. Connect an input to an output.
- U** Unit ID. Identifies the series and parameters (size) of the SRR.

Other commands are reserved for future use.

## Protocol Message Structure

Commands packets can be sent over the Ethernet and serial ports (if available) and use a standard STX/ETX protocol wrapper. Each packet includes a header byte, a two-byte address field, a command byte, necessary data bytes, end byte, and a checksum byte. The bytes are transmitted using an 8-bit word, with 1 stop bit and no parity. The general form for commands and messages is:

Header Address          Command          Databyte(s) End          Checksum

### Control Bytes

Control bytes are transmitted as hexadecimal values.

Command Header Byte = STX (0x02)

Command End Byte = ETX (0x03)

Response Header Byte = ACK (0x06) for accepted commands.

Response Header Byte = NAK (0x15) for rejected commands.

Response End Byte = ETX (0x03)

The Header Byte (STX) is also used to reset the command receive buffer. If this byte is received, it will be accepted as the beginning of a new message. The previous message will be discarded. The only exception to this is if the byte (0x02) is a checksum byte. When the buffer is reset, the checksum byte is also reset.

There is a 32-byte limit on command length. Any command longer than this will automatically generate an error response if or when an ETX end byte is received. If a new STX is received before an ETX, it will reset the command receive buffer and no error message will be sent.

If a break in communication occurs while a message is being transmitted (i.e., before the unit receives the ETX and CHK byte), the buffer will clear and the command will be lost (no response will be sent). This condition will occur if there is a delay of about 200 milliseconds between bytes.

### Address Field

The address field consists of two ASCII digits. The address for a control unit is normally set using the front panel keypad. Each unit will only respond to a command with a matching address. This allows multiple control units to be connected on a shared RS-422/485 control bus. The address can be set from 00 to FF on units with front panel configuration.

Address FF is a serial broadcast address. Any unit will respond to a command with an address of FF regardless of the actual serial address set for the unit. **Commands being sent to units over Ethernet must contain an address of FF for proper operation.** Otherwise a non-matching serial address could cause the command to be rejected even though the IP address was correct.

### Command

The command is one or more ASCII characters from A to Z. A list of available commands is in the next section.

### Data Bytes

Each command has a fixed number of data bytes. A response to a command may have a variable number of data bytes. In that case one of the data bytes will signify how many data bytes are contained in the message.

### Checksum

The checksum byte is a bit wise Exclusive OR (XOR) of all the bytes, inclusively, from the header to the ETX. For example:

```
02h 30h 30h 51h 03h 50h  
STX  0   0   Q  ETX CHK
```

## Command Descriptions

### ED: Set DHCP On/Off

This command turns DHCP on or off.

#### Command Format:

```
02 XX XX 45 44 30 03 XX  
STX ADR ADR E D 0 ETX CHK
```

```
02 XX XX 45 44 31 03 XX  
STX ADR ADR E D 1 ETX CHK
```

#### Example Command:

```
02 XX XX 45 44 30 03 XX  
STX ADR ADR E D 0 ETX CHK  
(Turn DHCP Off)
```

```
02 XX XX 45 44 31 03 XX  
STX ADR ADR E D 1 ETX CHK  
(Turn DHCP on)
```

#### Positive Response:

```
06 XX XX 45 44 03 XX  
ACK ADR ADR E D ETX CHK
```

#### Note:

DHCP will immediately be set as on or off. If DHCP is turned on the unit will not ask for new IP parameters from the DHCP server until the unit is reset or the power is cycled.

## EG: Set Ethernet Default Gateway

This command sets the default Ethernet gateway.

### Command Format:

```

02  XX  XX  45  47  XX  XX  XX  2E  XX  XX  XX  2E
STX ADR ADR  E   G  nn  nn  nn   .  nn  nn  nn   .

XX  XX  XX  2E  XX  XX  XX  03  XX
nn  nn  nn   .  nn  nn  nn  ETX CHK

```

### Example Command:

```

02  46  46  45  47  30  31  30  2E  30  30  30  2E
STX  F   F   E   G   0   1   0   .   0   0   0   .

30  30  30  2E  30  30  31  03  2D
 0   0   0   .   0   0   1  ETX CHK
(Set Gateway = 010.000.000.001)

```

### Positive Response:

```

06  46  46  45  47  03  07
ACK  F   F   E   G  ETX CHK

```

Note:

The change will take place after the current Ethernet session ends and the connection is released.

## EI: Set Ethernet IP Address

This command sets the Ethernet IP Address.

### Command Format:

```
02  XX  XX  45  49  XX  XX  XX  2E  XX  XX  XX  2E
STX ADR ADR  E   I  nn  nn  nn   .  nn  nn  nn   .

XX  XX  XX  2E  XX  XX  XX  03  XX
nn  nn  nn   .  nn  nn  nn  ETX  CHK
```

### Example Command:

```
02  46  46  45  49  30  31  30  2E  30  30  30  2E
STX  F   F   E   I   0   1   0   .   0   0   0   .

30  30  30  2E  32  33  34  03  27
 0   0   0   .   2   3   4  ETX  CHK
(Set IP Address = 010.000.000.234)
```

### Positive Response:

```
06  46  46  45  49  03  09
ACK  F   F   E   I  ETX  CHK
```

Note:

The change will take place after the current Ethernet session ends and the connection is released.

## ELD: Ethernet Lock Disable

This command disables the Ethernet lock. If the lock has been enabled (using the ELE command), command packets input from the Ethernet port are received but ignored except for the ELD command. This provides an additional level of control over the switch and the Ethernet port. The ELD command is used to disable the lock and enable the processing of command packets.

The ELD command must contain a password value that matches the current password in order for the Ethernet lock to be disabled. The default value for the password is “Quintech”. The value of the password can be changed using the ELP command.

### Command Format:

```
02 XX XX 45 4C 44 03 XX
STX ADR ADR E L D ETX CHK
```

### Example Command:

```
02 46 46 45 4C 44 51 75 69 6E 74 65 63 68 03 75
STX F F E L D Q u i n t e c h ETX CHK
(Disable Ethernet Command Lock)
```

### Positive Response:

```
06 46 46 45 4C 03 0C
ACK F F E L ETX CHK
```

### Note:

The password may be reset to the default “Quintech” from the front panel LCD and keypad.

An ELD command with an incorrect password value will return a NAK response.

The switch is shipped from the factory with the Ethernet lock disabled so it will accept and process command packets. If the ELE command is never issued, the Ethernet lock will never be enabled and the ELD, ELE, and ELP commands can be ignored.

## **ELE: Ethernet Lock Enable**

This command enables the Ethernet command lock. When the lock is enabled, command packets input from the Ethernet port are received but ignored except for the ELD command. The ELD command is used to disable the lock and enable the processing of command packets.

### **Command Format:**

```
02  XX  XX  45  4C  45  03  XX
STX ADR ADR E   L   E   ETX CHK
```

### **Example Command:**

```
02  46  46  45  4C  45  03  4D
STX  F   F   E   L   E   ETX CHK
(Enable Ethernet Command Lock)
```

### **Positive Response:**

```
06  46  46  45  4C  03  0C
ACK  F   F   E   L   ETX CHK
```

### **Note:**

The switch is shipped from the factory with the Ethernet lock disabled so it will accept and process command packets. If the ELE command is never issued, the Ethernet lock will never be enabled and the ELD, ELE, and ELP commands can be ignored.

If the Ethernet lock is on, valid command packets sent over the Ethernet will return a NAK message with the issued command, indicating that it was rejected because of the lock. Valid packets sent over the serial port will still be accepted.

## ELP: Set Ethernet Lock Password

This command sets a new Ethernet Lock Password. The password is an alpha-numeric value from 1 to 10 characters. A null password (no password) is also allowed.

### Command Format:

```
02 XX XX 45 4C 50 XX ... XX 03 XX
STX ADR ADR E L P [Password] ETX CHK
```

### Example Command:

```
02 46 46 45 4C 50 78 79 7A 7A 79 03 20
STX F F E L P x y z z y ETX CHK
(Set password to "xyzzy")
```

### Example Command:

```
02 46 46 45 4C 50 31 2B 52 61 4C 70 48 21 32 03 16
STX F F E L P 1 + R a L p H ! 2 ETX CHK
(Set password to "1+RaLpH!2")
```

### Example Command:

```
02 46 46 45 4C 50 03 58
STX F F E L P ETX CHK
(Set password to no password)
```

### Positive Response:

```
06 46 46 45 4C 03 0C
ACK F F E L ETX CHK
```

### Note:

Although almost any hex value or ASCII character can be used in the password, users would be wise not to use the hex values 00 – 1F or 7F – FF since these are not associated with keys on a standard keyboard. They may also cause undesirable side effects. In particular hex 02 (STX) and 03 (ETX) are used to delineate the command packet and should never be used in the password. If the password is set to some unknown value, it can be reset to the default "Quintech" from the front panel LCD and keypad.

## EP: Set Ethernet Port

This command sets the Ethernet port that is monitored for command packets. The default port set at the factory is 9100. There is no need to change this unless it conflicts with another network device.

### Command Format:

```
02  XX  XX  45  50  XX  XX  XX  XX  03  XX
STX ADR ADR  E   P  nn  nn  nn  nn  ETX CHK
```

### Example Command:

```
02  46  46  45  50  39  31  30  30  03  1C
STX  F   F   E   P   9   1   0   0  ETX  CHK
(Set Port = 9100)
```

### Positive Response:

```
06  46  46  45  50  03  10
ACK  F   F   E   P  ETX  CHK
```

Note:

The change will take place after the current Ethernet session ends and the connection is released.

## ES: Set Ethernet Subnet Mask

This command sets the Ethernet Subnet Mask.

### Command Format:

```

02  XX  XX  45  53  XX  XX  XX  2E  XX  XX  XX  2E
STX ADR ADR  E   S  nn  nn  nn   .  nn  nn  nn   .

XX  XX  XX  2E  XX  XX  XX  03  XX
nn  nn  nn   .  nn  nn  nn  ETX  CHK

```

### Example Command:

```

02  46  46  45  53  32  35  35  2E  32  35  35  2E
STX  F   F   E   S   2   5   5   .   2   5   5   .

32  35  35  2E  32  33  34  03  3B
 2   5   5   .   0   0   0  ETX  CHK
(Set Netmask = 255.255.255.000)

```

### Positive Response:

```

06  46  46  45  53  03  13
ACK  F   F   E   S   ETX  CHK

```

Note:

The change will take place after the current Ethernet session ends and the connection is released.

## **KL: Keypad Lock**

This command locks the front panel keypad. To unlock the keypad use the KU command.

### **Command Sent:**

```
02 XX XX 4B 4C 03 XX  
STX ADR ADR K L ETX CHK
```

### **Positive Response:**

```
06 XX XX 4B 4C 03 XX  
ACK ADR ADR K L ETX CHK
```

Note: The front panel will display “Keypad Locked”. The keypad can be unlocked from the front panel by entering the 3-digit password 857.

## KS: Keypad State

This command gives the locked/unlocked state of the front panel keypad.

### Command Sent:

```
02 XX XX 4B 53 03 XX  
STX ADR ADR K S ETX CHK
```

### Positive Responses:

```
06 XX XX 4B 53 4C 03 XX  
ACK ADR ADR K S L ETX CHK  
(keypad locked)
```

```
06 XX XX 4B 53 55 03 XX  
ACK ADR ADR K S U ETX CHK  
(keypad unlocked)
```

Note: This command will be accepted regardless of whether a user is logged in.

## **KU: Keypad Unlock**

This command unlocks the front panel keypad. To lock the keypad use the KL command.

### **Command Sent:**

```
02 XX XX 4B 55 03 XX  
STX ADR ADR K U ETX CHK
```

### **Positive Response:**

```
06 XX XX 4B 55 03 XX  
ACK ADR ADR K U ETX CHK
```

Note: The front panel will display “Keypad Locked”. The keypad can be unlocked from the front panel by entering the 3-digit password 857.

## Q: Query Path

This command polls for the current path. The response contains three ASCII data bytes.

### Command Sent:

```
02  XX  XX  51  03  XX
STX ADR ADR  Q  ETX CHK
```

### Example of a Positive Response:

```
06  XX  XX  51  31  35  03  XXO  (Path 15 is selected)
ACK ADR ADR  Q  1    5   ETX  CHK
```

## **RH: Hard Reset**

This command resets all parameters to the factory specified defaults. Note that the matrix and SRM module sizes are reset to 16x16 and the SRO to 4. If these are not correct, your matrix will no longer operate correctly. Other parameters are also changed that might make it difficult to access the controller to reconfigure the matrix.

**WARNING! DO NOT USE** this command unless you are absolutely sure you want the following configuration:

DHCP:	Off
Default Static IP:	192.168.0.249
Default Static Netmask:	255.255.255.0
Default Static Gateway:	192.168.0.1
Telnet Port:	23
QEC Ethernet Port:	9100
Serial Port:	RS232, 9600 baud, 8N1
RS485 Terminations:	Off
Matrix Size:	16x16
Module Size:	16x16
SRO Size:	4

### **Example Command Sent:**

```
02 XX XX 52 48 03 XX  
STX ADR ADR R H ETX CHK
```

### **Example Positive Response:**

```
06 XX XX 52 48 03 XX  
ACK ADR ADR R H ETX CHK
```

**RS: Soft Reset**

This command reboots the control program and is the equivalent of a power cycle.

**Example Command Sent:**

```
02  XX  XX  52  53  03  XX  
STX ADR ADR  R   S  ETX CHK
```

**Example Positive Response:**

```
06  XX  XX  52  53  03  XX  
ACK ADR ADR  R   S  ETX CHK
```

## S: Set Path

This command makes path changes remotely. The command contains two ASCII databytes to indicate the path.

### Command Sent:

02	XX	XX	53	30	31	03	53
STX	ADR	ADR	S	0	1	ETX	CHK

### Example Positive Response:

06	XX	XX	53	03	XX
ACK	ADR	ADR	S	ETX	CHK

**U: Unit ID**

This command makes path changes remotely. The command contains two ASCII databytes to indicate the path.

**Command Sent:**

02	XX	XX	55	03	47
STX	ADR	ADR	U	ETX	CHK

**Reply Sent:**

06	XX	XX	55	76	31	2E	32	31	...03	XX
ACK	ADR	ADR	U	v	1	.	2	1	...ETX	CHK

The exact syntax of this message (without the header, address, checksum, and end bytes) is:

Uv1.21/2.21 REVA SRR SERIES NNX1/1XNN

## Negative Responses:

Occasionally, the SRR will be unable to carry out a command due to various reasons. The NAK reply set is provided to help determine where the error occurred. A NAK reply will be sent after the SRR has received the CHK byte.

### x: Checksum Incorrect

This reply is sent when the checksum sent by the computer controller is different from the one calculated by the SRR. This message would indicate that data has been corrupted during transmission, for example:

```
15 XX XX 78 03 6E  
NAK ADR ADR x ETX CHK
```

### c: Command Unrecognized

This type of error message occurs when the unit receives an unspecified command. The unit will respond as specified below.

### Command Sent:

```
02 XX XX 42 03 43  
STX ADR ADR B ETX CHK
```

### Reply Sent:

```
15 XX XX 63 03 75  
NAK ADR ADR c ETX CHK
```

**i: Improper Data**

This reply is sent if improper amounts of data is contained in the protocol wrapper. For example, if a set path is sent containing four (4) ASCII digits, the unit will respond with the following message:

```
15 XX XX 69 03 7F
NAK ADR ADR i ETX CHK
```

This message may also be seen if too many data bytes are sent. It can be sent in reply to any command including those not containing data bytes (if data bytes are included with a query path command, for example).

**d: Data out of Range**

This message will be sent if the data bytes sent are outside the parameters of your switch. If the module is commanded to set path 16 and you have only eight paths, you will receive this message:

```
15 XX XX 64 03 72
NAK ADR ADR d ETX CHK
```

**Please Note:**

If a message contains multiple errors, the SRR will send a NAK to the first detected error. The unit will check for errors in this order:

1. Checksum error
2. Command unrecognized
3. Improper data
4. Data out of range

The only exception to this condition is when the quantity of total number of data bytes sent exceeds 2. Under this condition, the unit will detect improper data (an overflow of information) before it detects an unrecognized command. The SRR will accept an infinitely long (number of bytes) command, so long as none of those bytes is an ETX byte.

## Serial Interface

A new command can be sent to the matrix as soon as a response to the previous command is received. If a break in communication occurs while a message is being transmitted the input buffer will automatically clear and no error response will be given.

### Serial Parameters:

Baud Rate: 9600

Data Bits: 8

Stop Bits: 1

Parity: None

Protocol: STX/ETX

Flow Control: None. The program sending commands must wait until a response is received from the SRR before sending another command.

### Serial Pinouts:

#### RS-232

1 - DCD (Data Carrier Detected)

2 - RXD (Receive Data)

3 - TXD (Transmit Data)

4 - DTR (Data Terminal Ready)

5 - GND

6 - DSR (Data Set Ready)

7 - RTS (Request To Send)

8 - CTS (Clear To Send)

9 - NC

#### RS-422/485

1 - GND

2 - NC

3 - Non-Inverting Transmit

4 - Non-Inverting Receive

5 - GND

6 - Inverting Transmit

7 - NC

8 - NC

9 - Inverting Receive

### Note on the RS-232 Port:

No null modem or crossover cable is needed on the serial port.

### Note on RS-485 Mode:

RS-485 is compatible with RS-422. RS-485 allows multiple devices on a single shared serial bus. The SRR uses a 4-wire RS-485 interface.