

Quintech SFM Series Protocol v5.12

8/31/2004 Rev B

This document specifies a common command protocol that can be used to control a Quintech full fan-in (FFI) matrix or matrix controller from a computer. It is essentially the same as the standard 2.15 protocol for full fan-out (FFO) matrices except that the input and output fields are reversed.

Command Summary

This list gives the commands defined in Protocol 5.12

- C** Check Change Flag / Unit Status. This flag will be set if a crosspoint has been changed since the last polling or if any alarms are present.
- E** Ethernet. Various commands to set Ethernet parameters and control access.
- F** Firmware version. Identifies the model, protocol and firmware version, and size of the matrix as set on the controller.
- K** Keypad. Various commands to control access to the front panel keypad.
- L** Lock a crosspoint.
- O** Output query. Various commands to get information on the specified output.
- Q** Check queue. The queue stores up to 8 local changes made since the last "C" check.
- R** Reset. Soft reset equivalent to a reboot or a hard reset back to factory defaults.
- S** Set a crosspoint. Connect an input to an output.
- U** Unlock a crosspoint.
- Z** Access Control. Various commands to control access and manage accounts.

Other commands are reserved for future use.

QEC Telnet Console Command Structure

There are three interfaces to send commands to the SFM: a Telnet console, a QEC Ethernet port, and a serial port. When sending commands over the serial or QEC Ethernet ports, a STX/ETX bounded command packet is used. This is described in the next section. The packet structure is not used with the Telnet console interface. The same commands are used but no address, checksum, or ETX/STX packet boundaries are required. For example, to issue the Firmware Version command "F", you simply enter command mode on the console, type F and hit the Enter key.

QEC Protocol Message Structure

Command 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.** If you use a serial address other than FF in your Ethernet command packet, that serial address must match the serial address set for the target unit or the command will be rejected even if the IP address is 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

C: Check Change Flag/Unit Status

Each control port for the system maintains a change queue that allows changes throughout the system to be tracked. The change flag tells the user if any changes are in the change queue. The following changes will cause an entry in the change queue and set the flag:

1. Crosspoint (input-output connection) setting.
2. Lock status of a crosspoint (see L and U commands).
3. Access control settings for an input.
4. A user's group ID setting.
5. Enable/Disable of access control for the control port.

The queue will store up to eight changes made anywhere in the system. This command can be sent periodically to check if any changes have been made or if any alarms have occurred. The change flag is cleared when the queue is emptied by the Q command. The response will always contain 8h as the MSD (most significant digit). The LSD (least significant digit) will be determined as follows:

0h – No Change since last “Q” Check Queue command.

1h – At least one crosspoint has been changed locally.

2h – At least one alarm is present.

4h – Access control has been enabled/disabled or a user's group ID has changed.

8h – The queue has overflowed. If the queue has overflowed, all crosspoints should be queried.

Command sent:

```
02 XX XX 43 03 XX
STX ADR ADR C ETX CHK
```

Examples of positive responses:

```
06 XX XX 43 80 03 XX
ACK ADR ADR C 80 ETX CHK (No changes have occurred)
```

```
06 XX XX 43 81 03 XX
ACK ADR ADR C 81 ETX CHK (Crosspoint changes have occurred)
```

```
06 XX XX 43 88 03 XX
ACK ADR ADR C 89 ETX CHK (The queue has overflowed)
```

```
06 XX XX 43 85 03 XX
ACK ADR ADR C 85 ETX CHK (Access control & crosspoint changes have occurred)
```

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

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 static default Ethernet gateway.

Command format:

```
02  XX  XX  45  47  XX  XX  XX  2E  XX  XX  XX  2E
STX  AD  AD  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 = 10.0.0.001)
```

Positive response:

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

Note:

The change will take place in ten seconds. If DHCP is enabled the static gateway value will not be used until DHCP is turned off and the unit has been reset.

EI: Set Ethernet IP Address

This command sets the static 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 = 10.0.0.234)
```

Positive response:

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

Note:

The change will take place in ten seconds. If DHCP is enabled the static IP address will not be used until DHCP is turned off and the unit has been reset.

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 QEC 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 XX . . . . XX 03 75
STX ADR ADR E L D [ PASSWORD ] 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 QEC 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 QEC 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 "xyzzzy")
```

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 QEC Ethernet port that is monitored for STX/ETX 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 static 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. If DHCP is enabled this will not take effect until DHCP is turned off.

F: Firmware Version / Unit ID

This command will return a message with the protocol and firmware versions, the series and model number, and the size of the matrix. The fields will be returned as follows: "Firmware version" "Protocol version" "Model Number"/ "Matrix Size". For example, a 36x6 SRM would give a response of the form "Fv1.01 Pv5.12 SFM2150/036X006".

Command sent:

```
02 XX XX 46 03 XX
STX ADR ADR F ETX CHK
```

Example of positive response:

```
06 XX XX 46 76 31 2E 30 31 20 50 76 35 2E 31 32 20...
ACK ADR ADR F v 1 . 0 1 P v 5 . 1 2 ...

...56 46 4C 32 31 35 30 2F 30 33 36 58 30 30 36 3 XX
... S F M 2 1 5 0 / 0 3 6 X 0 0 6 ETX CHK
```

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

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.

L: Lock Crosspoint

This command sets a crosspoint and then “locks” it. Once locked, the crosspoint combination cannot be changed until it is either unlocked or locked again to a different port.

Command sent:

```
02 XX XX 4C 30 30 31 30 30 35 03 XX  
STX ADR ADR L 0 0 1 0 0 5 ETX CHK  
(Lock input 1 to output 5)
```

Positive response:

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

O: Query Output Channel

This command queries for the output connected to the specified input.

Example command sent:

```
02 XX XX 4F 30 30 31 03 XX  
STX ADR ADR 0 0 0 1 ETX CHK  
(Query the status of input 1)
```

Example positive response:

```
06 XX XX 4F 30 30 32 03 XX  
ACK ADR ADR 0 0 0 2 ETX CHK  
(Input 1 is connected to output 2)
```

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

OS: Query Output State

This command queries for the output connected to the specified input along with the locked/unlocked state and access control parameters.

The access control parameters are given by the last two characters in the response. They give numbers that represent an access control bitmap table:

Bit	7	6	5	4	3	2	1	0
Group	8	7	6	5	4	3	2	1
Hex	Response character 1				Response character 2			

If a particular bit is set, then that group is allowed to change a particular crosspoint with the L, S, and U commands. If the bit is clear then the corresponding group is not allowed access.

Character	Response 1: Groups allowed access	Response 2: Groups allowed access
0	none	none
1	5	1
2	6	2
3	5, 6	1, 2
4	7	3
5	5, 7	1, 3
6	6, 7	2, 3
7	5, 6, 7	1, 2, 3
8	8	4
9	5, 8	1, 4
A	6, 8	2, 4
B	5, 6, 8	1, 2, 4
C	7, 8	3, 4
D	5, 7, 8	1, 3, 4
E	6, 7, 8	2, 3, 4
F	5, 6, 7, 8	1, 2, 3, 4

Example command sent:

```
02 XX XX 4F 53 30 30 31 03 XX
STX ADR ADR O S 0 0 1 ETX CHK
(Query the state of input 1)
```

Examples of positive responses:

```
06 XX XX 4F 53 30 30 32 4C 30 31 03 XX
ACK ADR ADR O S 0 0 2 L 0 1 ETX CHK
(Input 1 is connected to output 2, is locked, and only users in group 1 are
allowed to change the crosspoint)
```

```
06 XX XX 4F 53 30 30 37 55 36 46 03 XX
ACK ADR ADR O S 0 0 7 U 6 F ETX CHK
(Input 1 is connected to output 7, is unlocked, and users in group 1, 2, 3,
4, 6 and 7 are allowed to change the crosspoint)
```

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

Q: Check Queue

This command will read the change queue. Each control port for the system maintains a change queue that allows changes throughout the system to be tracked. The change queue contains up to 8 crosspoint changes executed since the last Q command. This includes changes to the lock state of a crosspoint. All crosspoint changes are put in the queue regardless of the source. If more than one change is executed for a given output, only the last change will be stored in the queue.

The ASCII number after Q in the response is the number of changes that the queue contains and ranges from 0 to 8. If no crosspoint changes are stored in the queue this number will be zero. If more than 8 changes occurred since the last Q command, this number will not be valid and bit 3 of the queue change flag (see command C) will be set to signal that an overflow has occurred. After the queue is checked the queue and the queue change flag are cleared, including the crosspoint, queue overflow, and access control change bits.

Command sent:

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

Example positive responses:

```
06 XX XX 51 30 03 XX
ACK ADR ADR Q 0 ETX CHK
(No changes have occurred)
```

```
06 XX XX 51 32 30 30 35 30 31 35 30 31 36 30 30 31 03 XX
ACK ADR ADR Q 2 0 0 5 0 1 5 0 1 6 0 0 1 ETX CHK
(Two changes have occurred: input 5 was connected to output 15, and input
16 was connected to output 1)
```

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

RH: Hard Reset

This command resets all parameters to the factory specified defaults. Note that the matrix and SFM module sizes are reset to 16x16 and the SFO 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:	On
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
SFM Module Size:	16x16
SFO Rows:	4
SFM Model:	2150

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 Crosspoint

This command will connect one input to an output. The command byte is followed by three bytes giving the input, then three bytes giving the output.

Example command sent:

```
02 XX XX 53 30 30 31 30 30 32 03 XX  
STX ADR ADR S 0 0 1 0 0 2 ETX CHK  
(Connect input 1 to output 2)
```

Positive response:

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

U: Unlock Crosspoint

This command will unlock a locked crosspoint.

Command sent:

```
02 XX XX 55 30 30 31 30 30 35 03 XX  
STX ADR ADR U 0 0 1 0 0 5 ETX CHK  
(Unlock input 1 to output 5)
```

Positive response:

```
06 XX XX 55 03 XX  
ACK ADR ADR U ETX CHK
```

ZA: Set Group Access for Output

This command can only be executed by the Admin.

This command sets the privilege for a group to change an input.

Command structure:

ZA:<GID>:<access>:<output>

GID = Group ID. Can be 1-8, with 1 being Admin.

Access = Access Control. 1 = Allow, 0 = Deny.

Output = Matrix output number. Can be 1 to the size of the matrix.

If access is allowed for that input, then any user in that group can issue an L, S, or U command for that input.

Example Command sent:

```
02 XX XX 5A 41 3A 32 3A 30 3A 30 30 35 03 XX
STX ADR ADR Z A : 2 : 0 : 0 0 5 ETX CHK
(Deny group 2 access to input 5)
```

Positive response:

```
06 XX XX A5 41 03 XX
ACK ADR ADR Z A ETX CHK
```

ZC: Current User

This returns the user ID, group ID, and username of the current logged in user.

Example Command sent:

```
02 XX XX 5A 43 03 XX  
STX ADR ADR Z C ETX CHK
```

Example Response:

```
06 XX XX 5A 43 3A 31 3A 31 3A 41 64 6d 69 6E 03 XX  
ACK ADR ADR Z C : 1 : 1 : A d m i n ETX CHK  
(User 1, group 1, username = Admin)
```

ZG: Set User Group

This command can only be executed by the Admin.

This command sets a new group for a user.

Command structure:

ZG:<username/UID>:<GID>

Username = The username that will be assigned a new password.

UID = User ID. Alternatively the user ID can be specified.

GID = Group ID.

The username must start with a character, not a number.

Example Command sent:

```
02 XX XX 5A 47 3A 41 64 6d 69 6E 3A 31 03 XX
STX ADR ADR Z G : A d m i n : 1 ETX CHK
(Set the Admin user to be in group 1)
```

Example Command sent:

```
02 XX XX 5A 47 3A 31 3A 31 03 XX
STX ADR ADR Z G : 1 : 1 ETX CHK
(Set the Admin user to be in group 1)
```

Positive response:

```
06 XX XX A5 47 03 XX
ACK ADR ADR Z G ETX CHK
```

Note: This command will set a flag in the Change “C” command response.

Note: Some firmware versions do not implement this command. For those firmware releases, the group ID is set to be the same as the user ID and can't be changed. For example, User 1 (UID = 1 = Admin) is in group 1, UID 2 is in group 2, and so on.

ZI: Login

This command is used to login to a particular control port. (A different user may be logged in to each available command port on a controller.) The command is sent with the username and password. The user ID and group ID are returned in response to a successful login.

Example Command sent:

```
02 XX XX 5A 49 3A 41 64 6d 69 6E 3A 31 03 XX
STX ADR ADR Z I : A d m i n : 1 ETX CHK
```

Example Response:

```
06 XX XX 5A 49 3A 31 3A 31 03 XX
ACK ADR ADR Z I : 1 : 1 ETX CHK
(User 1, group 1)
```

ZL: List user by User ID (UID)

This command can only be executed by the Admin.

This command shows the current group ID, username, and password for a given user ID (UID).

Command:

ZL:<UID>

Response structure:

ZL:<GID>:<username>:<password>

Example Command sent:

```
02 XX XX 5A 4C 3A 31 03 XX
STX ADR ADR Z L : 1 ETX CHK
```

Example response:

```
06 XX XX 5A 4C 3A 31 3A 41 64 6d 69 6E 3A 31 03 XX
ACK ADR ADR Z L : 1 : A d m i n : 1 ETX CHK
(User ID 1 is in group 1, has a username of Admin and password = 1)
```

ZO: Logoff System

This command will logoff the current user.

Example Command sent:

```
02 XX XX 5A 4F 03 XX  
STX ADR ADR Z O ETX CHK
```

Positive response:

```
06 XX XX A5 4F 03 XX  
ACK ADR ADR Z O ETX CHK
```

ZP: Set User Password

This command can only be executed by the Admin.

This command sets a new password for a user.

Command structure:

ZP:<username/UID>:<password>

Username = The username that will be assigned a new password.

UID = User ID. Alternatively the user ID can be specified.

Password = Up to 14 alphanumeric characters.

Example Command sent:

```
02 XX XX 5A 50 3A 41 64 6d 69 6E 3A 32 41 62 03 XX
STX ADR ADR Z P : A d m i n : 2 A b ETX CHK
(Set the Admin password to 2Ab)
```

Example Command sent:

```
02 XX XX 5A 50 3A 31 3A 32 41 62 03 XX
STX ADR ADR Z P : 1 : 2 A b ETX CHK
(Set the Admin password to 2Ab)
```

Positive response:

```
06 XX XX A5 50 03 XX
ACK ADR ADR Z P ETX CHK
```

ZU: Set Username

This command can only be executed by the Admin.

This command sets a new username for a user.

Command structure:

ZP:<username/UID>:<new username>

Username = The username that will be assigned a new password.

UID = User ID. Alternatively the user ID can be specified.

New Username = Up to 14 alphanumeric characters.

The username must start with a character, not a number.

Example Command sent:

```
02 XX XX 5A 55 3A 41 64 6d 69 6E 3A 55 31 03 XX
STX ADR ADR Z U : A d m i n : U 1 ETX CHK
(Set the Admin username to U1)
```

Example Command sent:

```
02 XX XX 5A 55 3A 31 3A 55 31 03 XX
STX ADR ADR Z U : 1 : U 1 ETX CHK
(Set the Admin username to U1)
```

Positive response:

```
06 XX XX A5 55 03 XX
ACK ADR ADR Z U ETX CHK
```

ZX: Show Access Control On/Off

This command shows the current port number and whether access control is on or off for the port.

Command:

ZL:<PID> where PID = Port ID.

Response structure:

ZL:<PID>:<access on/off>

Port IDs:

- 0: Current port (whatever port is receiving the command)
- 1: Local (Keypad)
- 2: Remote
- 3: PC Control In
- 4: QEC Ethernet Port
- 5: Telnet Ethernet Console Window

Example Command sent:

```
02 XX XX 5A 58 3A 31 03 XX
STX ADR ADR Z X : 0 ETX CHK
```

Example response:

```
06 XX XX 5A 58 3A 34 3A 31 03 XX
ACK ADR ADR Z X : 4 : 1 ETX CHK
(The current port is 4 = QEC port and access control is on.)
```

Negative Responses:

Occasionally, the matrix 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 matrix 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 matrix controller. This message would indicate data has been corrupted during transmission.

Negative response sent:

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

c: Command Unrecognized

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

Negative response sent:

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

u: Command Unavailable

This type of error message occurs when the matrix receives command that is not implemented or can't be done on a particular system or at a particular time. The unit will respond as specified below.

Negative response sent:

```
15 XX XX 75 03 XX  
NAK ADR ADR u ETX CHK
```

i: Improper Data

This reply is sent if an improper number of data bytes are contained in the protocol wrapper. For example, if an "S" command is sent with only an output number and no input number. This error will also be sent for any command that contains too many or too few bytes, even if the command does not have any data bytes.

Negative response sent:

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

d: Data out of Range

This message will be sent if the data bytes sent are outside the parameters of your matrix. If the SRM is polled for the status of input 17 and you only have 16 inputs, you will receive this message.

Negative response sent:

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

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 matrix controller before sending another command.

SFM "Control In" Serial Pinouts:

RS-232

1 - GND

2 - TXD

3 - RXD

4 - DTR

5 - GND

6 - DSR

7 - RTS

8 - CTS

9 - Not Used

RS-422/485

1 - GND

2 - Not Used

3 - Non-Inverting Transmit (+)

4 - Non-Inverting Receive (+)

5 - GND

6 - Inverting Transmit (-)

7 - Not Used

8 - Not Used

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 matrix unit uses a 4-wire RS-485 interface.