

## Robot Communications Protocol

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This protocol allows any Fta32 Video system running its Sequencer to act as a slave to another robotic system. The Sequencer is active whenever hardware is installed that it can control. The user must choose to start the Sequencer; when the Sequencer is not running, messages sent to the Fta32 system have no effect. Finally, for the robot commands to have effect, appropriate commands must be placed in the Sequencer's script to recognize and act on them.

### General Format

The protocol uses RS-232 ASCII text messages. The serial line is setup at 19200 baud, no parity, 8 bit characters, and 1 stop bit. The communications port is chosen on the LogOn screen.

Each message consists of a command and any number of parameters. Each parameter is separated from the others by one or more blank spaces. The message is terminated by CR or CR + LF. Commands are case sensitive. In the following descriptions, n0, n1, etc., are numeric parameters which may include negative signs and decimal separators consistent with the Windows locale settings.

### Commands Received by Fta32 from Controlling Robot

Parameters enclosed by square brackets [] are optional and may be omitted.

#### **OK [MovieBaseName]**

OK signifies the Fta32 should continue with its script if it has been waiting for a signal from the controlling robot. The Sequencer instruction to wait for external go-ahead is Program Control | Wait for external device. This instruction also has a timeout parameter, Wait time, which can be up to 60 seconds. If this parameter is zero or left blank, then there is no timer employed and the script will wait indefinitely. There is a GoTo line number if a timeout is specified and the timeout occurs. This allows for error trapping.

If a MovieBaseName is specified, then any saved movie will have this name plus an Index, if an Index is specified in the script. This allows the controlling robot to directly specify the name of the movie that is about to be taken. If the script already has a movie base name specified by a script instruction, then the robot's name is concatenated to the script's name. Within the

Sequencer, the Index is specified as the second parameter in the Movie Capture | Save movies as instruction. Leave the parameter blank for no Index. The path may be further specified by commands listed below.

## **ER**

ER signifies an error condition. It will cause the Sequencer to leave a Wait for external device condition, just as if it had timed out. A GoTo line must have been specified in the Wait for external device instruction for the error condition to cause a branch in the Sequencer operation.

## **MP DrivePath**

MP makes a drive path for storing movies that are acquired by the Sequencer. The path must include the drive letter and should end with “\”. If this command is not sent, the Sequencer uses its default path, which can be set explicitly within the script. The Sequencer contains an explicit make path instruction which can be used instead.

## **MD Directory**

MD makes a specific folder for storing movies that are acquired by the Sequencer. If this command is not sent, the Sequencer uses its default path, which can be set explicitly within the script. The Sequencer contains an explicit make directory instruction which can be used instead.

## **Commands Sent by Fta32 to Controlling Robot**

Parameters enclosed by square brackets [] are optional and may be omitted.

### **P [n0] [n1] [n2]**

P is a position set for the external robot. This command is sent from the Sequencer Stage Moves | Move external device instruction. The numeric parameters are optional, but allow data to be embedded in the Fta32 Sequencer instructions to be acted upon by the robot. This may be a convenient way of tweaking the robot’s placement of drops.