

Wheel Positioning via RS232

Local application
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The model IFW (Intelligent Filter Wheel), made by Optec, is designed to position a filter wheel to one of 5 positions, with one filter in each position of the wheel. It supports a simple RS232 interface to provide for remote access, although it also has a local control box. This note describes the local application `WHEE` that is designed to provide the client side of the serial interface, so that the hardware appears as any other Acnet device. Each IRM includes a serial port interface, so this LA will run in a 68K node.

The parameter layout is as follows:

<i>Param</i>		<i>Size</i>	<i>Meaning</i>
ENABLE	B	2	Usual LA enable Bit#, remote status in this Bit# + 1.
PERIOD		2	Period of updating wheel position, in cycles.
TARGNODE		2	Target node# with serial port
WH POS	C	2	Wheel id/position Chan#

The following commands are used by the LA:

WSMODE	Select remote access mode	!
WIDENT	Request wheel identity	A–E
WFILTR	Request wheel position	1–5
WGOTOx	Set wheel position, x range 1–5	*
WEXITS	Return to local access mode	END

The operation of `WHEE`, once enabled, is to first acquire remote access. It periodically sends the `WSMODE` command until the expected response `!` is received, which acknowledges that remote access is enabled (and local access is disabled). Once in remote mode, the LA periodically asks for the current wheel position via the `WFILTR` command, and less often, it asks for the wheel identity. It deposits the result, as a hexadecimal value in range `A1–E5`, into the wheel position channel reading field. This can be an Acnet device like any other.

In order to change the wheel position, set the wheel position channel to the desired position. The valid range of such settings is 1–5. (The setting value may also include the wheel identity code, but it is not necessary.) The LA monitors the setting field of this channel, and when it sees its low 4 bits nonzero and in the valid range, it sends a `WGOTOx` command to tell the hardware to “go there.” This can take some time, but when the hardware reaches the specified position, and returns a `*`, the LA clears the wheel position setting to 0 to acknowledge success, and it resumes its periodic query for the current wheel id and position.

An error code returned in response to a `WGOTOx` command is of the form `ER=n`. If the LA sees this reply, it sets the wheel position channel to the negative of the error code number, such as `-4`, `-5`, or `-6`. The LA then does nothing for several seconds to allow the user to read the code before it resumes its normal updates. Here are the meanings of these codes:

ER=4	wheel stuck in a position
ER=5	x not in range 1–5
ER=6	wheel is slipping and takes too many steps to reach position

If `WHEE` is ever disabled, it sends the `WEXITS` command to return to local access mode.