

RPF6
user manual

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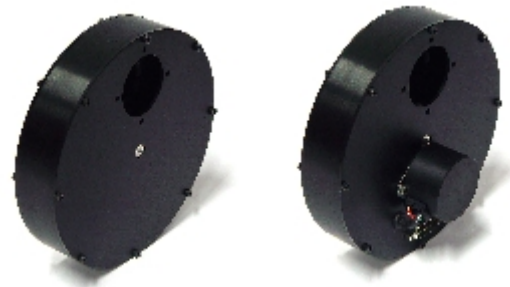
INTRODUCTION

RPF6 is a motorized filter wheel, which has six different holders for filters of 1¼" diameter.

It has been designed to be driven directly from ViSTA, the DTA software that manages the cameras, but it is also supplied with a separated control program for all Windows systems.

There are two different connection systems: by means of RS232 or by means of the parallel port.

It is possible to set the rotation speed and a different stop position for each filter.



The motor hold current is user adjustable.

This product can be customized specifying different size, number of filters, input or output adapters.

The typical applications are Photometry, Microscopy and colour sequences.

THE STANDARD SYSTEM INCLUDES:

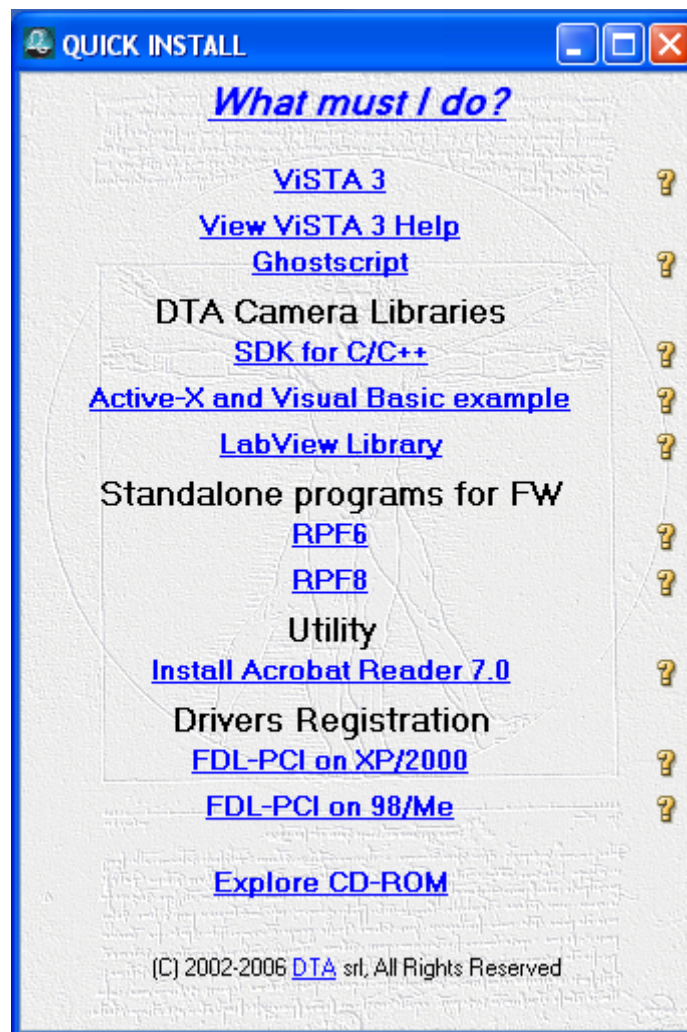
- assembled unit in light alloy with threaded 31.75 input
- RS232/Parallel interface
- 2.5 m PC parallel link cable
- managing software for Windows 95/98/ME/XP/2000
- 230V power supply
- case, manual with test report and 24 months of warranty

HARDWARE AND SOFTWARE INSTALLATION

Hardware and software installation of this instrument is particularly simple and intuitive. You must conform to the following steps:

I) SOFTWARE:

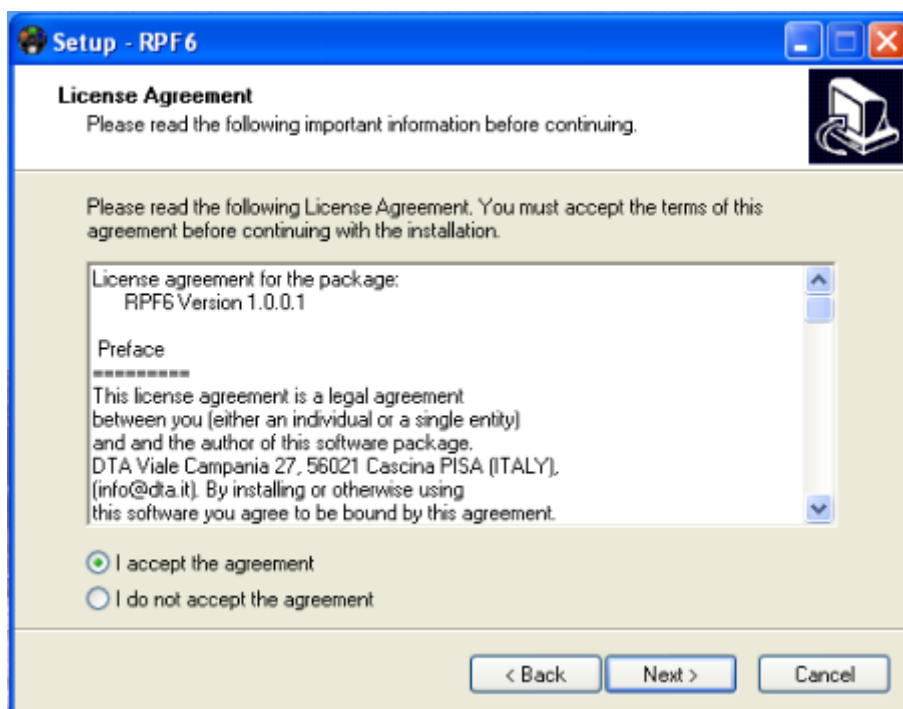
1. Insert the CD ROM, provided with the filter wheel and the "Quick Install" will appear. Click on RPF6 by the "Standalone programs for FW" menu:



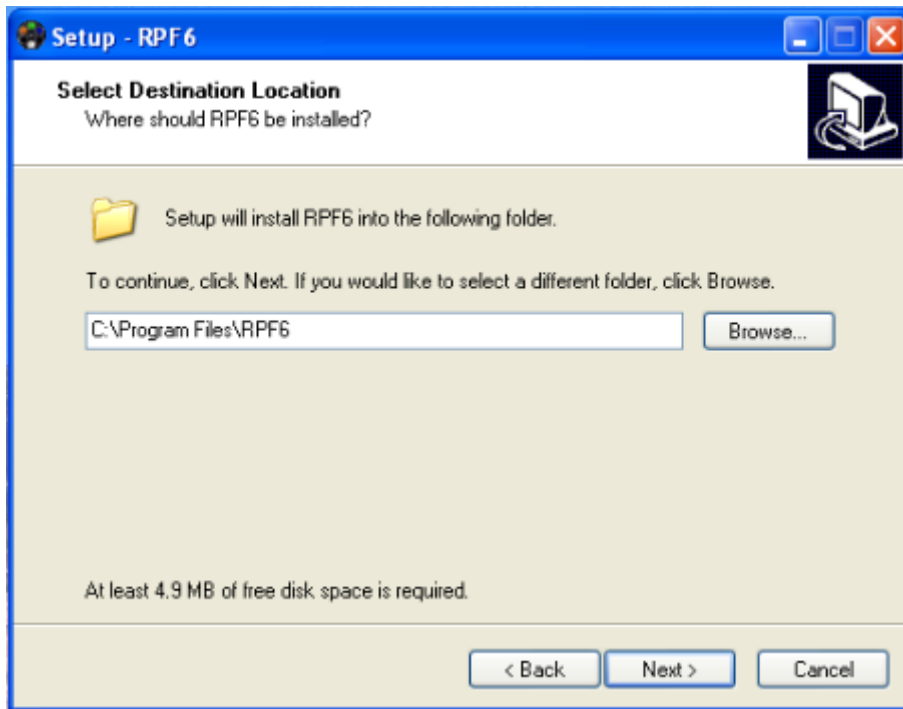
2. Now starts the installation of the program. Click on Next to continue the installation:



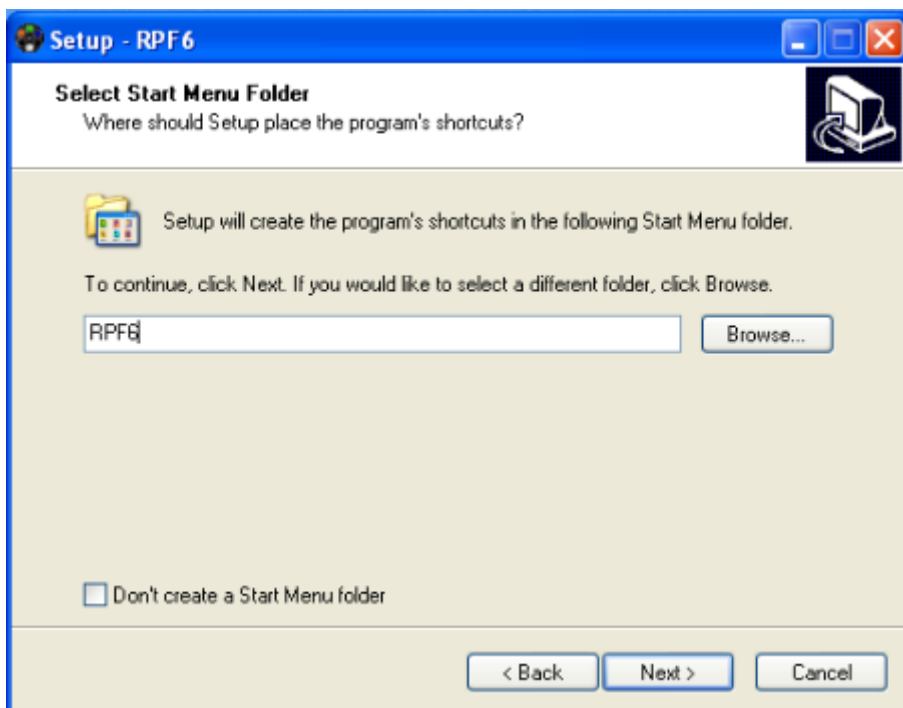
3. You'll be informed about the license agreement terms. Follow the indications shown in the window below and click on Next to continue the installation:



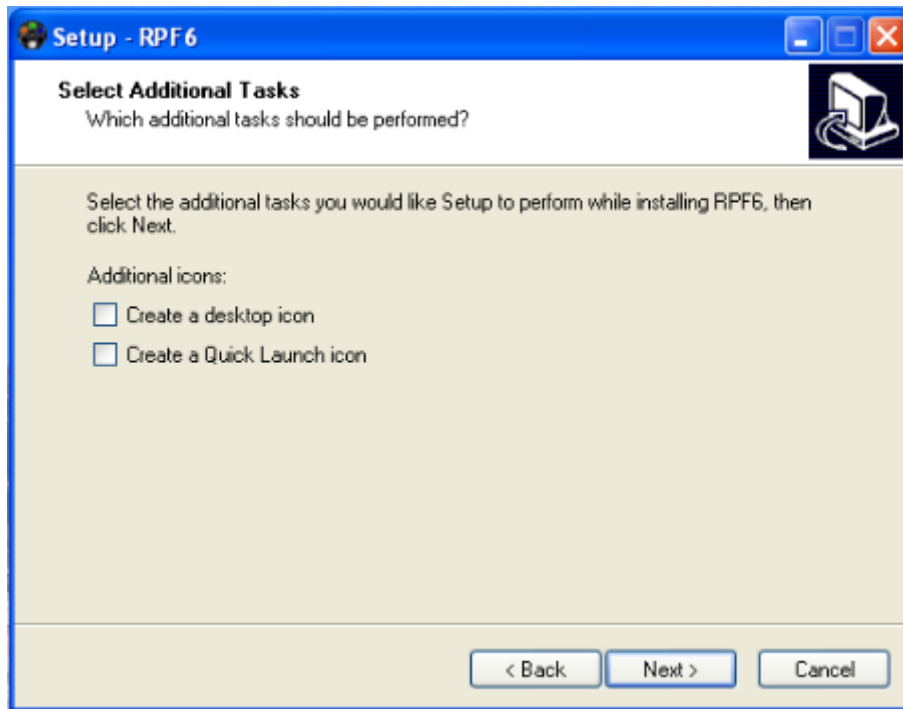
4. Select the folder where to install the RPF6 (we recommend you to choose the destination location suggested in the window below) and click on Next to continue the installation:



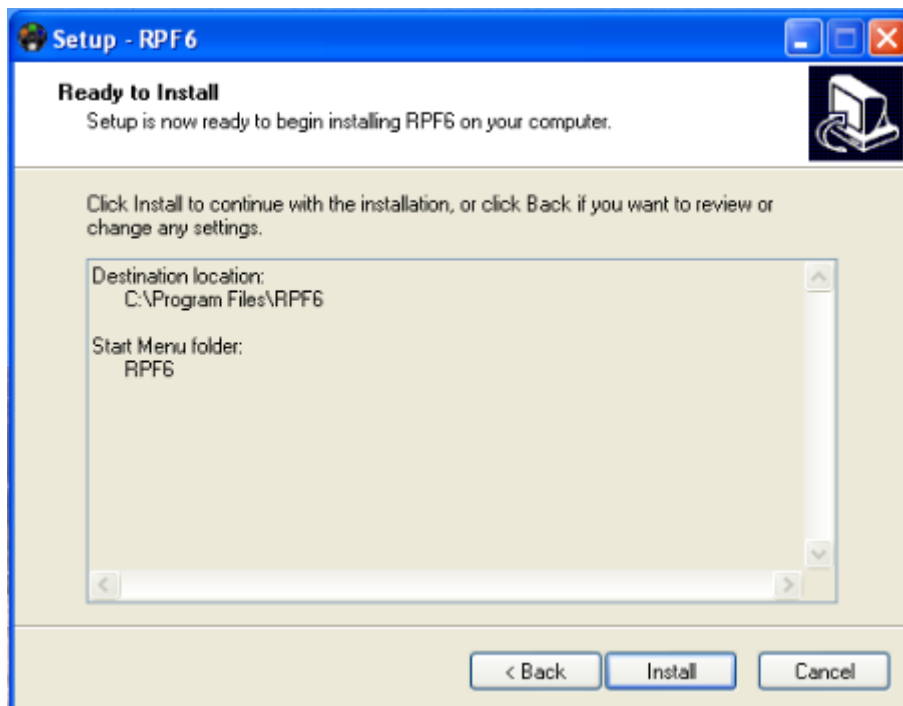
5. Select the Start Menu Folder (we recommend you to follow the suggestion indicated in the window below) and click on Next to continue the installation:



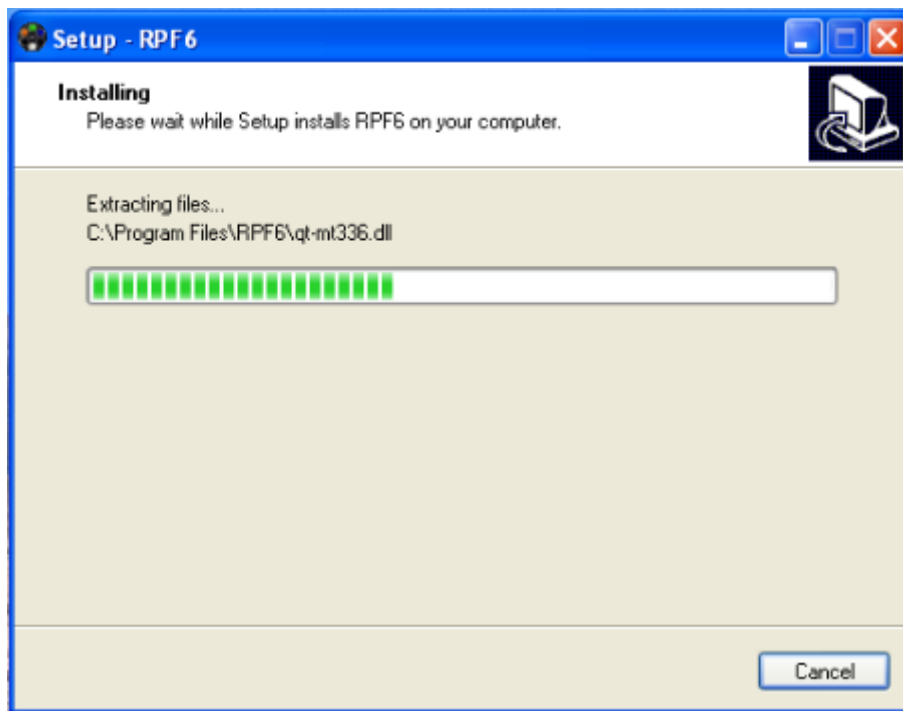
6. Select the additional tasks you prefer and click on Next to continue the installation:



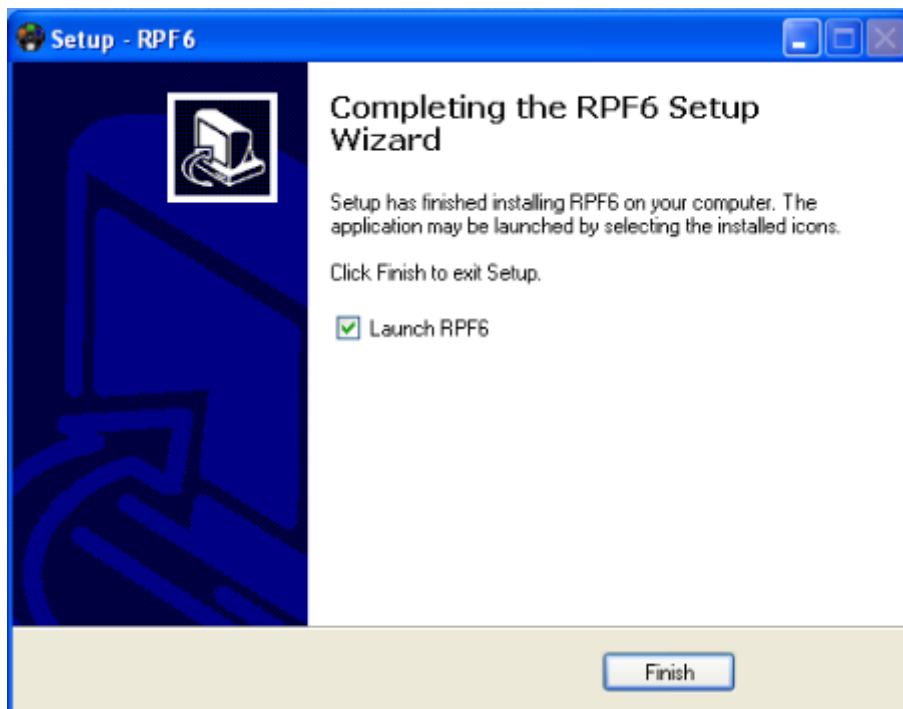
7. Click on Install or on Back to change any settings:



8. Wait while the wizard installs the software (just few seconds).



9. When the installation has been completed, a window like the one below will appear. Click on finish to close the wizard and to launch the RPF6 (recommended choice):

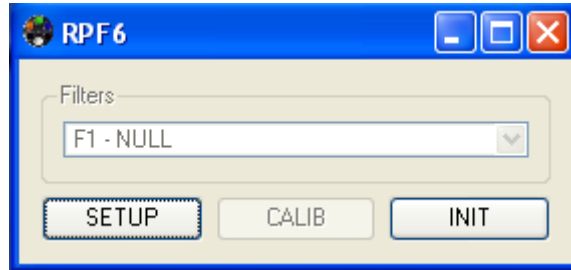


II) HARDWARE:

1. Connect the feeder to the instrument and to the PC serial port (this operation must be performed before **turning on the computer**).
2. Turn on the computer and start up Windows.
3. Feed the instrument.
4. Now the instrument is working and it selects the first filter automatically.
5. Start the RPF6.EXE program. Thanks to simple graphic interface it makes possible to:
 - Show the serial or parallel port by which the filter wheel has been connected to the computer
 - Choose the angular velocity of the filter wheel
 - Give a name to each of your filters
 - Calibrate the wheel
 - Select each filter

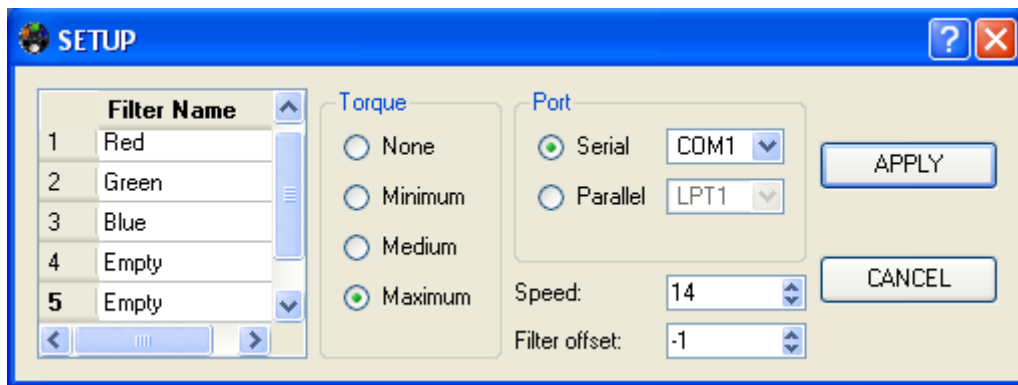
TUTORIAL

When you run the RPF6.EXE program, the following window will appear, allowing you to manage the filter wheel:



The first time you run the program, you have to set up the filter wheel parameters.

Click on SETUP to enter your parameters and the following panel will appear:



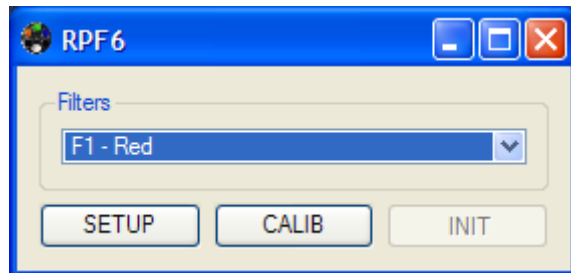
This panel consists of 5 fields, from left to right:

- 1) **Filter name:** it allows you to give a name to each of your filters (according to their position on the filter wheel) just typing it on the proper field.
- 2) **Torque:** it allows you to able or disable the holding torque of the filter wheel. You can choose between the following intensities
 - **None:** it turn off the holding torque (the power absorption of the filter wheel is 10 mA)
 - **Minimum:** set the holding torque at the minimum value (the power absorption is 90 mA)
 - **Medium:** set the holding torque at the medum value (the power absorption is 130 mA)
 - **Maximum:** set the holding torque at the maximum value (the power absorption is 350 mA)
- 3) **Port:** By this fileds you can use the Serial or the Parallel port to control the filter wheel.
- 4) **Speed:** it allows you to set the filter's positioning speed.

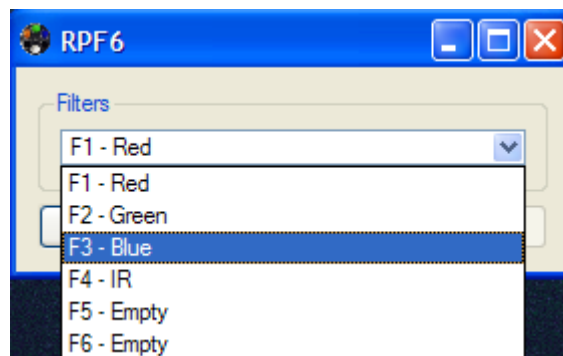
- 5) **Filter offset:** it allows you to change the alignment of the filter wheel. Positive values correspond to clock wise rotation, negative values correspond to counter clock wise rotation.

From now on, the parameters are stored, so everytime you run the program, you can manage the filter wheel on the basis of these settings by the use of the RPF6 panel.

Let describe it in details:



- 1) **Filters:** it allows you to select the filter you want to use for your acquisition of the image, just choosing it by the list:



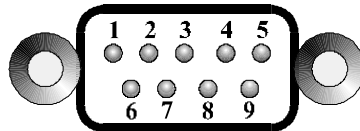
or by pressing the function keys 'F1' ... 'F6' to select filters '1' ... '6' respectively.

- 2) **SETUP:** it allows you to change the filter wheel parameters as described previously.
- 3) **CALIB:** clicking on this function, the filter wheel is automatically aligned on the first filter.
- 4) **INIT:** it allows you to initialize the filter wheel in order to manage it by the use of the RPF6 program on the basis of the parameters you have already setted according to the previous explanation.

RPF6 CONNECTOR'S DETAIL

The filter wheel can be connected to the PC either by means of the serial interface or the parallel one. Nevertheless, using the serial interface you will obtain the better connection, because it enables to use very long connection cables .

CONNECTOR'S NUMERATION



SIGNALS ON THE CONNECTOR

PIN	SIGNAL	COMMENT
1	READY	Parallel port Handshake
2	TxD	Serial Transmission
3	RxD	Serial Reception
4	D3	Parallel Bit 3
5	GND	Ground
6	D2	Parallel Bit 2
7	D1	Parallel Bit 1
8	D0	Parallel Bit 0
9	VDD	Feed 12V 500 mA (max)

FILTER WHEEL'S SOFTWARE MANAGEMENT.

It is possible to check the RPF6 filter wheel by programming the serial interface. These are the statements to be respected:

- bit-rate : 4800
- no parity bit
- 8 characters plot
- 1.5 bit stop

The following controls are available:

1. "F" < filter number > <CR>
2. "N" < filter number > <steps > <CR>
3. "R" <CR>
4. "E" <CR>
5. "V" <velocity> <CR>
6. "Z" <CR>
7. "D" <duty cicle> <CR>
8. "D" <CR>
9. "O" <offset> <CR>

CONTROL DESCRIPTION

1. "F" < filter number > <CR>

Let suppose we want to set filter number 2; taking into account the positionings range between 0 to 5, it will be enough to send:

- a) character "F";
- b) character "1";
- c) carriage return.

(<CR> indicates carriage return, whose ascii code is 13).

After sending the control, in case of not transmission errors, the filter wheel will set the specified filter (in our example, filter number 2) and, once the operation is concluded, it will transmit us: "ACK"<CR>.

Otherwise, if there have been transmission errors, no one operation will be implemented and it will transmit: "NACK"<CR>.

2. "N" < filter number> <steps > <CR>

Let suppose we want to vary the steps number between filter 2 and filter 3 and increase them to 50; it is sufficient to transmit:

- a) character "N";
- b) character "2";
- c) a character whose ascii code is equivalent to the steps number (in this case a character whose ascii code is 50);
- d) carriage return.

Even in this case, in case of not transmission errors, the filter wheel will transmit: "ACK"<CR>. Otherwise, no one operation will be implemented and it will transmit: "NACK"<CR>.

3. "R" <CR>

This control enables us to know the present position of the filter wheel.
Let suppose that presently it is selected filter number 3, then if we transmit:

- a) character "R";
- b) carriage return.

the filter wheel will transmit: "3ACK"<CR> if there have been no transmission errors, and NACK"<CR> if there are errors.

4. "E" <CR>

This control enables us to know the firmware version.

Transmitting:

- a) character "E";
- b) carriage return.

the filter wheel will answer: <2 byte> "ACK"<CR>.

For example if the firmware version is 1.0, we will receive: "10ACK"<CR>.

Even in this case, if there have been transmission errors, the filter wheel will transmit "NACK"<CR>.

5. "V" <velocity> <CR>

It is possible to change the wheel angular velocity by transmitting:

- a) character "V";
- b) a character whose ascii code indicates the velocity (velocity range gets from 220 for high angular velocity to 180 for low ones);
- c) carriage return.

The filter wheel will transmit: "ACK"<CR> if there have been no transmission errors; "NACK"<CR> on the contrary.

6. "Z" <CR>

If we want to have a perfect alignment between the telescope axis and each filter axis, it will be enough to transmit:

- a) character "Z";
- b) carriage return.

The filter wheel will implement the alignment, if there have not been transmission errors, it will set filter number 0 and will transmit "ACK"<CR>. In case of transmission errors, it will transmit "NACK"<CR>.

7. "O" <offset> <CR>

With this control we can choose the initial offset for the filter wheel alignment.

The value is indicated by a ascii code character.

If you set the character 26, the filter wheel is nominally aligned.

Setting values higher than 26, the filter wheel performs a clock wise rotation.
Setting values lower than 26, the filter wheel performs a counter clock wise rotation.

The syntax is clear and the wheel answer will be:
ACK<CR>
and NACK <CR>.

8. "D" <duty - cycle > <CR>

To change the duty cycle it is sufficient to send:

- a) character "D";
- b) a character included within 0 and 3 (0 = void torque; 1 = minimum torque; 2 = medium torque; 3 = maximum torque)
- c) <CR>

This point the wheel will answer ACK<CR> or NACK <CR>, as in the other cases.

9. "D" <CR>

This control enables us to know the present duty cycle of the microcontroller. The answer will be: <duty-cicle> ACK <CR> oppure NACK<CR>.

NOTE: the Power absorption changes according to the value of the holding torque you setted. In particular:

- **NONE:** 10 mA
- **MIN:** 90 mA
- **MED:** 130 mA
- **MAX:** 350 mA

SPECIFICATIONS

POSITIONING SPEED

0.2 s

NUMBER OF POSITIONS

6

STANDARD MOUNT

1¼"

SPEED CONTROL

Yes

SERIAL INTERFACE

RS232 4800 Baud

PARALLEL INTERFACE

4 bit input, 1 bit output

MAXIMUM FILTER THICKNESS

8 mm

BACKFOCUS

30 mm

POWER SUPPLY

12V 500mA (max)

DIMENSIONS

Φ 140 mm

OPTIONS

RGB-6

31.7 mm RGB interference filter kit

NIK-6

Adapter for Nikon lens

MIN-6

Adapter for 42x1 mm lens

ARH-6

Adapter for HiRes

ARI-6

Adapter for DISCOVERY, iCAM

PAR-6

Standard parallel port link cable

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