

# How to install a Wyatt Technology DAWN or miniDAWN with an AKTA HPLC system

## Part I: UV (a.k.a. DAD / PDA) detectors:

Connect the PS2 end of the Wyatt AKTA Analog Output cable p/n **164211** to the Analog Out connection on the rear of the AKTA FPLC system UV module. The large door at the rear of the AKTA unit must be opened to gain access to the rear of the UV module.

Connect the RJ-12 connector end of this cable to the Aux1/Aux2 connection at the rear of the HELEOS or TREOS. This connection will display the analog voltage of the AKTA UV detector on the Aux1 channel in ASTRA. Note: *This cable must be modified if the cable will be connected to a Wyatt Optilab rEX, T-rEX or ViscoStar detector.*



**Fig 1. Rear of AKTA modules**



**Fig. 2: Wyatt miniDIN/RJ-12 cable p/n 164211**



**Fig. 3: AKTA UV back panel**



**Fig. 4: HELEOS/TREOS back panel**

**Note:** When the **164211** is connected to the HELEOS or TREOS Aux1/Aux2 connector on the rear of the detector the UV analog signal is taken into ASTRA as the auxiliary 1 channel. Similarly, an Aux3/Aux4 connection would produce a UV signal on the Aux3 channel in ASTRA.

### **Part III: Autosampler:**

When properly connected, the AKTA Unicorn method will send a trigger signal to ASTRA to automatically begin data collection when an injection is made.



**Fig. 5: Wyatt AKTA/RJ-12 autoinject cable  
p/n 164210**



**Fig. 6: AKTA "Remote" port on pump**

Connect the Wyatt AKTA injection cable p/n **164210** (Cable Assy, AKTA Autoinject) to the inside rear of the AKTA unit. The 9 pin DB connector connects to the "Remote" connector on the rear of the AKTA pump module. To access this "Remote" connection open the rear, mesh door of the AKTA unit. Make sure the connection is made to the AKTA pump module and not the AKTA UV module.

Connect the other end of the Wyatt AKTA injection cable to the Autoinject In connector at the rear of the Wyatt Heleos or Treos detectors.

***Note:** The autosampler is **not** factory configured to send an adequate electrical pulse (contact closure) to the HELEOS or TREOS upon injection. Please see the configuration guide below to configure this output. Once configured, this pulse can be used to initiate ASTRA data collection if ASTRA is properly configured. There is no formal communication between the HPLC and ASTRA beyond this simple pulse, nor does ASTRA control the autosampler in any way.*

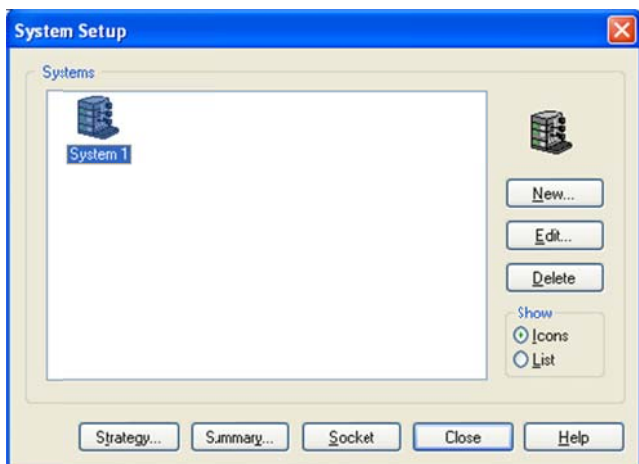
### **Part II: Software configuration:**

#### **Section 1: Unicorn Software Changes to Create Auto Inject Signal**

The AKTA unit uses **Auxiliary Equipment AuxOut1** signals to trigger the Wyatt ASTRA auto injection start. To activate the AKTA AuxOut Events one must add "Auxiliary Equipment" to the "Component" list for the AKTA System.

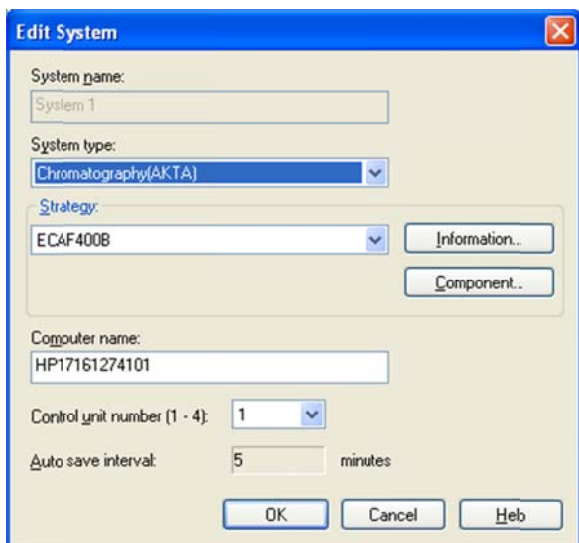
Open UNICORN Manager:

Select main menu item "**Administration**", and select "**System Setup**". This should open and display the following window:



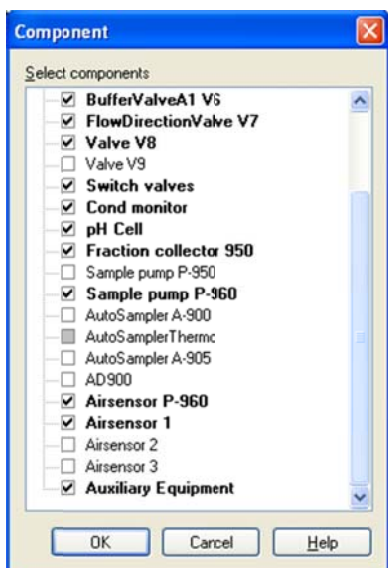
**Fig. 7: System Setup Display**

Double click on the System 1 (The user may have given the system a special name) Icon in the window above to open the following window:



**Fig. 8: Edit System Profile View**

Click the "Component" button to open the window below:



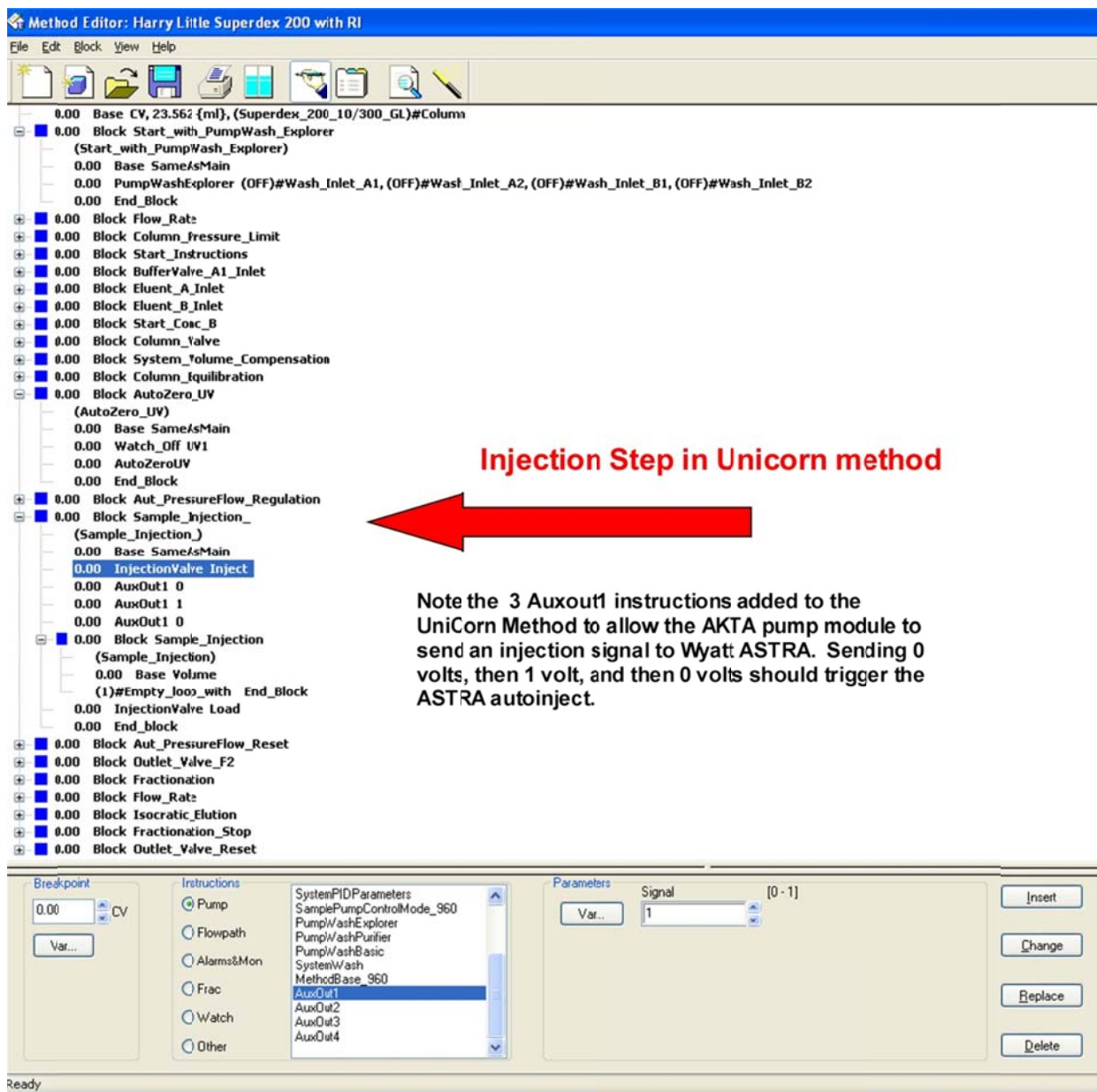
**Fig. 9: Component View**

Place a check mark in the box for "**Auxiliary Equipment**" in the window above. Click "OK" then OK again, and then "Close" to return to the UNICORN Manager.

## Unicorn Method Changes to Enable ASTRA Autoinject Signal

Open the Unicorn "Method Editor"

In Unicorn Method Editor: Select: **File < Open**: Navigate to the Unicorn method to be used and open it. The display should look similar to the window below



**Fig. 10: Method Editor**

Expand the [+] "Block Sample Injection" of the method and insert three (3) AuxOut1 instructions for the **Pump**. **1st**: AuxOut1 with Signal = 0, **2nd**: AuxOut1 with Signal = 1, and **3rd**: AuxOut1 with Signal = 0. In the

bottom portion of the above window make sure the pump is selected. Enter the 0 or 1 in the “Signal” field, and use the “Insert” button to insert the instruction into the Unicorn method.

The modifications to the Unicorn Method in the Block Sample Injection should look like the display above.

**Save this newly modified method.**

## Unicorn Software Changes for UV Detector:

Note: To change the AKTA UPC-900 UV detector parameters from the front panel of the UV detector module “The user interface of the monitor must be unlocked if connected to a UNICORN control system”. *Page 14, Monitor UPC-900, User Manual 18-1125-55 Edition AE.*

Wyatt	Din 280	Din 260	Din 254
White (+)	Brown (1)	Green (3)	Orange (5)

## AKTA UV Range

On the front panel of the AKTA UV detector set the UV Analog Out to 1.0 AUFS. (AUFS = Absorbance Units Full Scale) Refer to the AKTA manual for directions to set this parameter. Using this AKTA UV setting the UV analog output will be 0 to 1.0 volts with 0 absorbance outputting 0 volts and 1.0 absorbance units outputting a voltage of 1.0 volts.

## AKTA UV Offset (zero level).

The AKTA UV offset default value is 10 %. This means that when the AKTA UV detector is “zeroed” the analog output voltage will be 10 % of 1.0 volts or 0.10 volts. There is no need to change this offset just be aware that when the AKTA UV is zeroed that the UV signal in ASTRA will read 0.1 volts.

## AKTA UV Wavelength.

Set the AKTA UV to the desired wavelength. Generally for protein work a wavelength of 280 nm is recommended.

## AKTA UV Flow Cell Path Length.

The UV flow cell path length must be entered in ASTA in the ASTRA UV detector profile. The AKTA UV flow cell path length may be 0.2 cm or 0.5 cm (other path lengths may be available). The flow cell path length should be labeled on the AKTA UV flow cell.

## Appendix 1: Wyatt Wiring

### Auxiliary Connector Wire Colors:

	aux1 (+)	aux1 (-)	aux2 (+)/ Autoinject in	aux2 (-)/ Autoinject in
HELEOS or TREOS	White	Black	Red	Green
EOS or TriStar	Brown	Blue	Brown	Blue





**Fig. 11: HELEOS/TREOS RJ-12 cable**  
p/n P4045-19

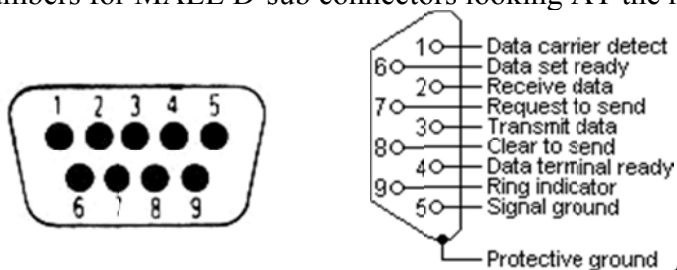


**Fig. 12: Wyatt EOS/TriStar Turck cable**  
p/n P4045-05

## **Appendix 2: AKTA UV Wiring**

### **AKTA Autoinject out:**

PIN numbers for MALE D-sub connectors looking AT the male pins.



**Fig. 13: AKTA 9-pin connector wiring**

The pins on the MALE DSub connector are as follows:

PINS 1-4 are inputs only.

PIN 5 is ground.

PIN 6 – referred to as “AUX 1” in the Unicorn Software;

PIN 7 – AUX 2

PIN 8 – AUX 3

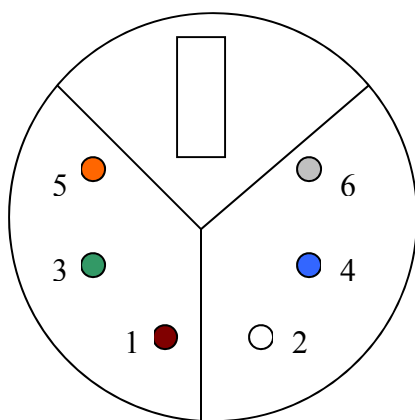
PIN 9 – AUX 4

### **AKTA UV Analog Out:**

*\*Note: Wyatt representatives have only seen AKTA systems with one analog output. Wiring specifications are provided for an AKTA UV instrument with more than one analog output.*

On rear panel find the “miniDIN” style connector, labeled as “Analog Output”, has a range from 0 to 1 VDC.

A signal cable may be provided by AKTA or purchased: “18-1110-64” \$115.00 signal cable, 6 pin/miniDIN.



**Fig. 14: AKTA miniDIN connector wiring**

According to AKTA Manual:

Wire #1 is [+] and Wire #2 is [-] for  $\lambda_1$  (in our case 280 nm)

Wire #3 [+] and Wire #4 [-]  $\lambda_2$  (260 nm)

Wire #5 [+] and Wire #6 [-]  $\lambda_3$  (254 nm)

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For additional information, please refer to the DAWN or miniDAWN hardware manual or contact Wyatt Technology Support at [support@wyatt.com](mailto:support@wyatt.com)