AstroDrive 7072/7152 User's Manual

Software Version: XXXX1-09801

Project: XXXX – XXXX

Rev: 01.0

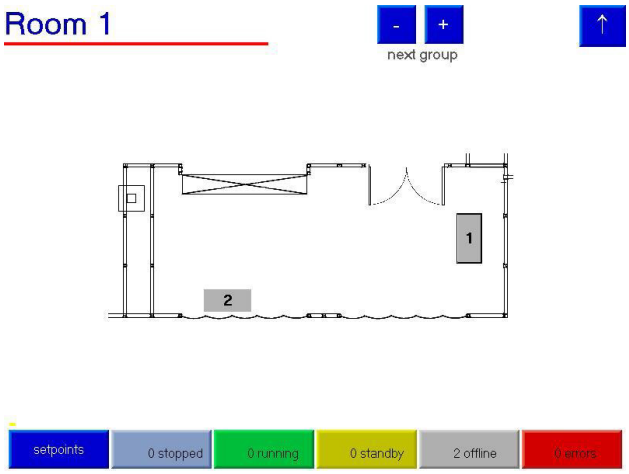
AstroDrive 7072/7152 User's Manual

Table of Contents

9. 1. **System overview**

1.1. Functional Overview

The AstroDrive 7072/7152 console controls/monitors 1 fans organized in 1 room:



1.2. Nodes & States

The term 'node' in this manual refers to a fan or a sensor. Nodes (fans and sensors) are assigned a unique identifier consisting of room name + unit #. The unit #s are unique within each room and numbered consecutively starting at 1. A node can be assigned to only one room.
The user can put each node –individually, or all in a room; or the whole facility – in any one of the following states:

- Run– In this state, the fan runs at speed set for Run
- Standby– In this state, the fan runs at speed set for Standby
- Stop– In this state, the fan will Stop
- Offline– In this state, communication between fan and console is deactivated. The fan continues running at its latest speed setting. All limit checking for this node is disabled.

1.3. Error monitoring

The following errors are monitored at each node:

- Communication error on the LAN
- RPM high and low limits

When an error is found, the alarm is activated and the error is recorded in the event log. Acknowledge the alarm (facility display) to turn it off.

THE NODE MUST BE TAKEN OFFLINE TO RESET ITS ERROR STATUS.

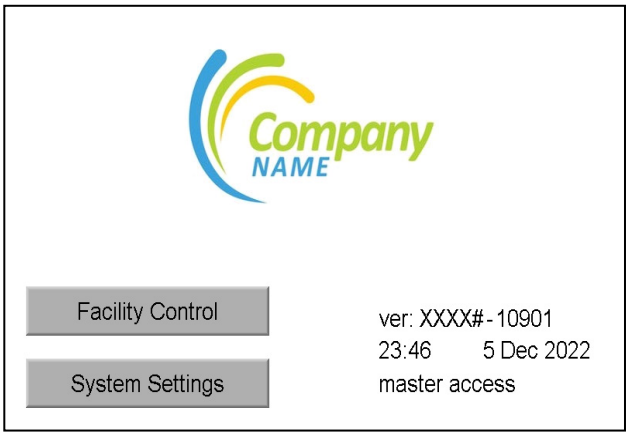
1.4. Guidelines for using the displayed screens

All screens feature a '↑' button in the upper right corner. Use this button to return to the next higher screen.

Variables intended for operator entry or touch are shown as buttons. To enter a value in the variable, press the button to activate the variable. A new value can be entered via the keyboard. The LEFT arrow key will erase the value. When the desired value has been entered, press the ENTER key to store the value and update the system. If the variable value continues to blink after pressing the ENTER key, the value entered is not valid or outside of allowed limits.

The ESC key can be used at anytime to abort the variable entry process.

2. Main screen

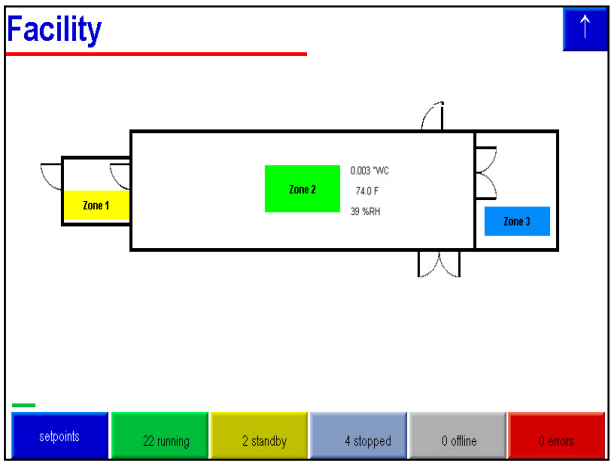


The main screen shows in the lower right corner the software version number, system time and date, and the current access level.

If the keypad is not used after 3 minutes, the screen will automatically go to the facility overview screen.

3. Facility control

3.1. Facility overview



This screen shows the total number of nodes and groups defined in the system. It also shows the number of fans found with an error, offline, Run, Standby and Stop.

Fans with error, offline indicate problems or potential problems requiring attention by the operator. Communication will be terminated to fans with a comm error. The user must change the fan's state to re-start communication with the fan.

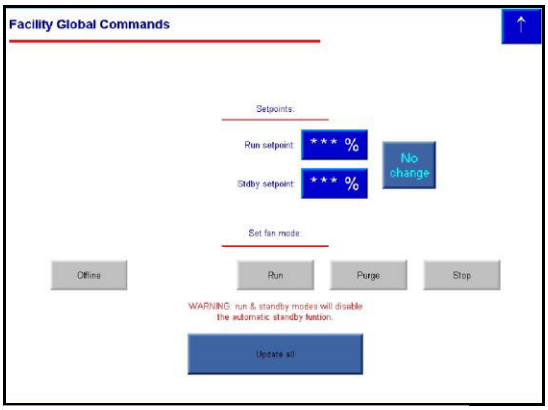
Press the group icon to access the group overview screen. Press any of the keys at the bottom of the screen to access the facility global command screen.

If an error is found at anytime (if the alarm is activated) an alarm is turned on and the screen automatically goes to the facility overview screen. Here an "ALARM!" message is

shown. Press this button to acknowledge and turn off the alarm. In this case, the error indication(s) will remain until the error conditions are corrected or the fan is taken offline.

If the emergency stop function input is activated this will be indicated on the factory overview screen.

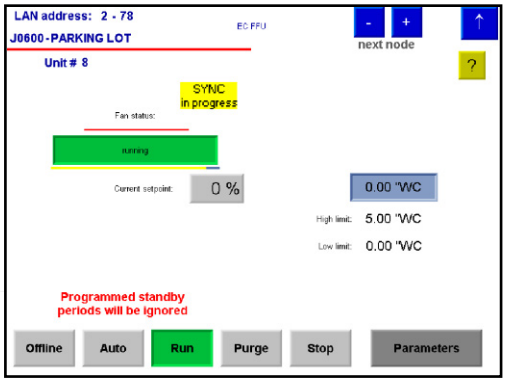
3.2. Facility global commands



In this screen the operator can set the 3 speeds or state for all fans in the system. The system is updated with the new values only after the "update all fans" button is pressed. Press the ↑ button to abort the entry process without implementing the change.

4. Fan control

4.1. EC fan control screen



This screen shows the status of the fan identified by the unit # and group name. The fan's current speed setting and RPM are shown.

The '-' and '+' keys allow the operator to navigate to the previous or next fan in that group.

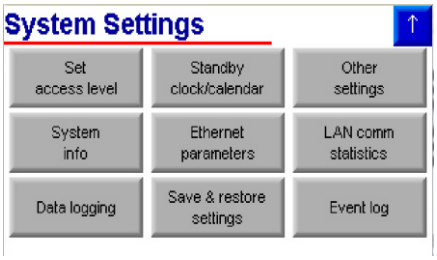
The fan's 3 speed set points and RPM high and low limits can be adjusted by pressing the 'Parameters' button.

4.2. Set parameters (EC FFU)

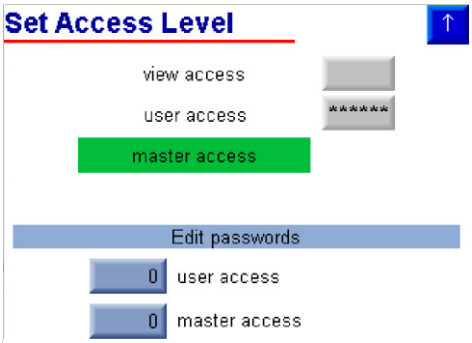
The fan's set point and RPM limits can set here for the 3 speeds.

The 'Assign' button is used only during system setup to assign the address to the FFU, if required.

5. System settings



5.1. Select access level



Three levels of access are:

- View access: The operator can only view the system operation and fan settings. No changes are allowed. VIEW DOES NOT HAVE A PASSWORD.
- User access: The operator can view all, acknowledge an alarm, and change only the state of the fans. This enables the user to initially acknowledge an alarm condition.
- Master access: The operator has complete access to all features and functions.

The current access level is highlighted in this screen. The access level can be changed by entering the valid password (1-5 digits) for the new level desired. The view access level does not have a password. Simply touch the button to activate this level.

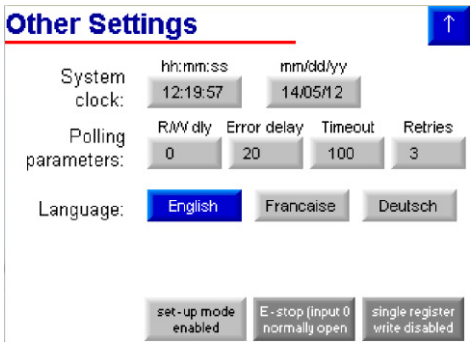
If 'master' access is active, the passwords can be viewed and changed.
Press the ESC button to abort the password entry process at any time.

Default password for all three levels is a single "0" without the parenthesis.

5.2. Clock / calendar function

Clock Calender function does not apply to this custom program.

5.3. Other settings



This screen allows the user to:

- change the system time and date,
- set polling parameters,
- select the display language,
- enable/disable set-up mode,
- invert the E-stop input from normally open to normally closed
- enable the single register write option

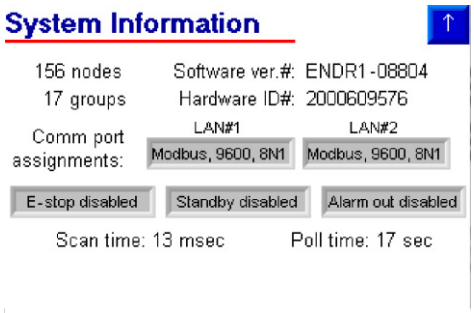
The polling parameters affect the speed of the continuous updating / checking of the fans on the LAN. A slower speed improves system robustness, but its response time is, of course, slower.

'Error delay' is the most important of these parameters. This determines the time delay between when a communication error is found and when the alarm is activated. If during this delay period a subsequent attempt to communicate is successful, then delay period is reset and the alarm will not be activated.

The 'read/write delay', 'timeout' and 'retries' parameters should normally not be adjusted without consulting from factory.

After the AstroDrive 7072/7152 has been correctly set-up on site, it is recommended to disable the set-up mode. This will disable the user's ability to assign the FFU address and change the 'error delay' parameter for the nodes.

5.4. System information

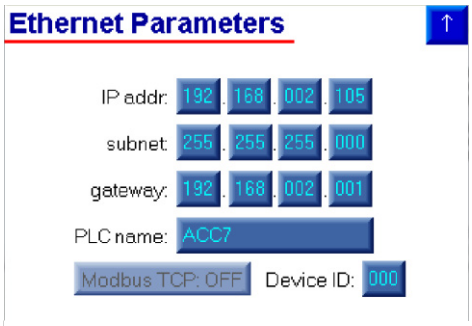


This display shows the basic configuration options enabled for this application. The options shown are configured by the manufacturer when the unit is sold.

The scan time is an approximate measure of the time needed for the AstroDrive 7072/7152 PLC to update outputs and react to inputs connected directly to the AstroDrive 7072/7152

The poll time is the approximate time for the AstroDrive 7072/7152 to update and react to changes in the nodes attached via the LAN connection.

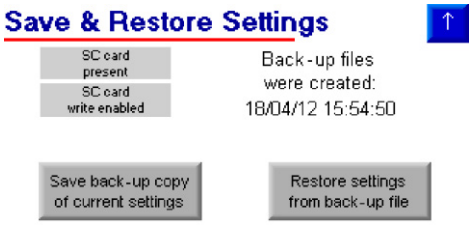
5.5. Ethernet parameters.



This display allows the user to define the:

- Unit IP address
- Subnet mask
- Gateway (or router) IP address
- PLC name – max 8 characters, case sensitive, must be unique on the LAN
- Device ID: used only for Modbus TCP communication

5.6. Save & restore parameters



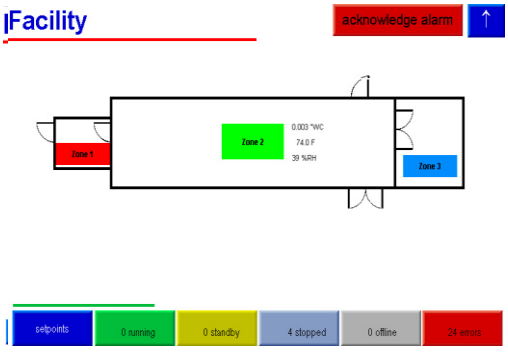
A back-up copy of the current node settings (all fans and sensors) can be saved to an SD card inserted in the AstroDrive 7072/7152. This copy can also be restored (written) to the AstroDrive 7072/7152.

This feature is useful once the fans have been commissioned on site. Saving a back-up copy of the fan settings provides assurance that these will not be lost and can easily be rewritten to the AstroDrive 7072/7152.

The micro-SD card must be formatted using the Tools program found in the Unitronics SD Card Suite and can be downloaded from this site: http://www.unitronics.com/Content.aspx?page=Downloads.

6. Fan errors

6.1. Alarm function & error monitoring



If a fan error is detected, the system will automatically activate the alarm. The facility overview screen will be displayed with an “ALARM!” message is shown.

Press this button to acknowledge and turn off the alarm. In this case, the error indication(s) will remain until the node(s) is(are) reset, ie, the node is taken offline.

The following errors are monitored at each node:

- Communication error on the LAN
- RPM high & low limits (run & purge) exceeded for EC FFUs
- Fan fault for AC FFUs
- Sensor value high & low limits exceeded (run & purge)

When an error is found, the alarm is activated and the error is recorded in the event log. Acknowledge the alarm (facility display) to turn it off.

THE NODE MUST BE TAKEN OFFLINE TO RESET ITS ERROR STATUS.

If a fan experiences a communication error, the system will not try to communicate with the fan. This is necessary to prevent degrading the system response (ie, polling) time.

7. Advanced user information

7.1. Setting key Ethernet comm parameters

To set key system parameters necessary for Ethernet communication, go to the system settings screen and press the ‘comm parameters’ button.

7.1.1. IP & default gateway addresses

The IP address is the address of the AstroDrive 7072/7152 (PLC) unit. This must have the same subnet address as the host PC, router or gateway to which the AstroDrive 7072/7152 (PLC) is directly connected.

The subnet mask depends on the type of network employed. In almost all cases the subnet mask will be either 255.255.0.0 (for a medium-sized intranet) or 255.255.255.0 (small networks). The former reserves last two octets in the IP address for the subnet address. The latter reserves only the last octet for the subnet address.

The default gateway address is the IP address of the host PC, router or gateway to which the AstroDrive 7072/7152 (PLC) is directly connected.

7.1.2. PLC name

The PLC name consists of up to 8 ASCII characters. This is required and used as a unique identifier by all programs that employ the Ethernet connection to communicate with the AstroDrive 7072/7152. Examples of such programs are: Remote Operator, UniOPC Server, and UniDownLoader.

The correct capitalization is necessary for using this name in application programs.

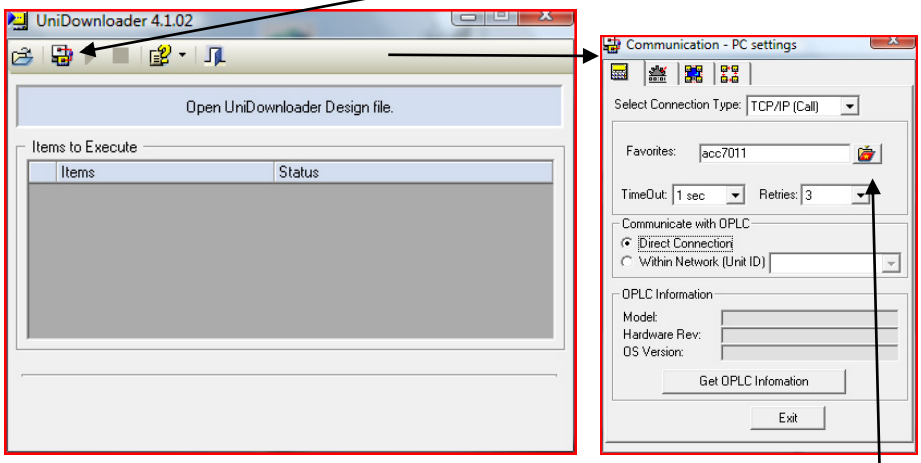
7.2. Downloading and installing program updates from the Manufacturer

7.2.1. Install the UniDownLoader program from Unitronics. The program can be downloaded from: www.unitronics.com/Content.aspx?page=Downloads

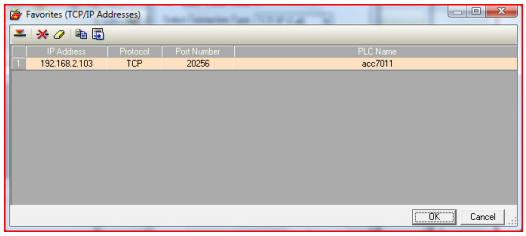
7.2.2. Connect the AstroDrive 7072/7152 to your PC. Insert the RJ11-to-RJ232 adapter cable in port 2 (port 1 is also possible). If your PC does not have an RS232 interface, use a USB-to-RS232 converter.

7.2.3. Start the UniDownLoader program.

7.2.4. Open the communication settings window.



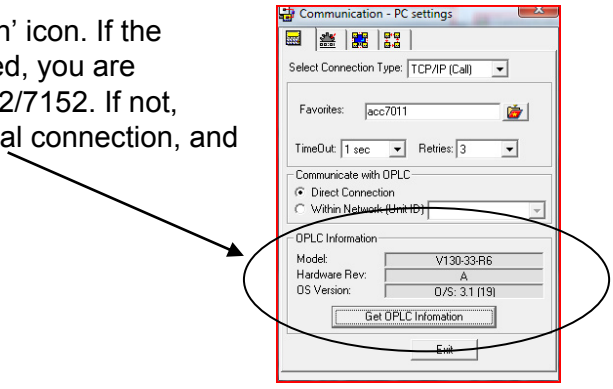
7.2.5. Set connection type to TCP/IP (call). Click on the favorites icon to open the IP settings window.



correct PLC information is displayed, you are connected with the AstroDrive 7072/7152. If not, then check the settings, the physical connection, and confirm that the PLC is running.

7.2.6. Enter the IP address of the AstroDrive 7072/7152 (PLC), and its PLC name - use correct capitalization for this name. The port number should be 20256. Then click on 'OK' to close this window and return to the communication – PC settings window.

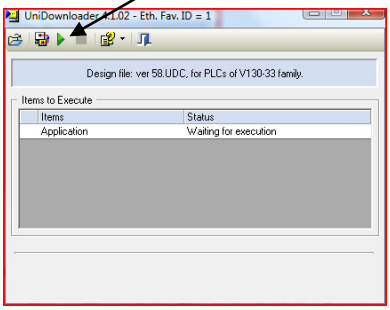
7.2.7. Click on the 'Get OPLC Information' icon. If the correct PLC information is displayed, you are connected with the AstroDrive 7072/7152. If not, then check the settings, the physical connection, and confirm that the PLC is running.



7.2.8. Click on 'Exit' to close the communication – PC settings window and return to the UniDownLoad main window.

7.2.9. Click on the 'open runner design' icon to load the new AstroDrive 7072/7152 program supplied by manufacturer.

7.2.10. After selecting the .udc update file supplied by manufacturer, one or two items will appear waiting for execution. Press the green run icon to start the upgrade process.



7.2.11. After successfully upgrading the AstroDrive 7072/7152 software, close the UniDownLoad program and cycle the AstroDrive 7072/7152 power off / on. This will reset the AstroDrive 7072/7152 and start the new program. The AstroDrive 7072/7152 system parameters & fan settings will not be lost during this upgrade and re-initialization process.

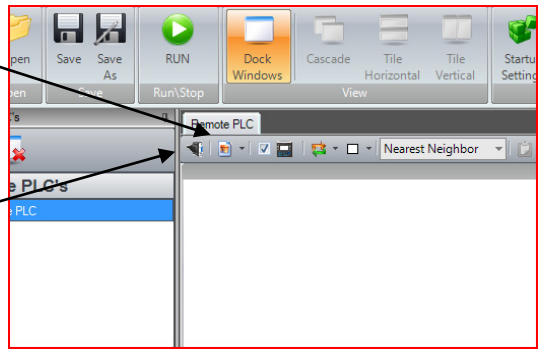
7.3. <u>Manual remote control via an Ethernet connection (optional feature for the AstroDrive7072/ 7152)</u>

7.3.1. Install the Remote Operator program from Unitronics. The program can be downloaded from: www.unitronics.com/Content.aspx?page=Downloads

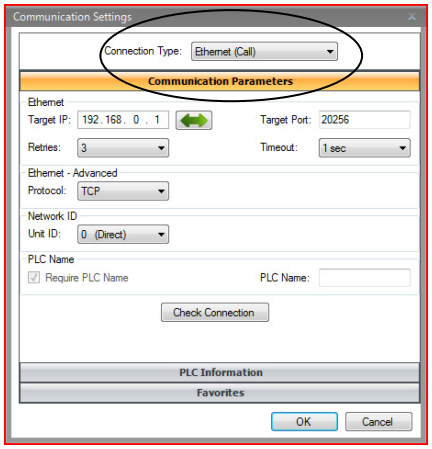
7.3.2. Start Remote Operator

7.3.3. The manufacturer will supply you with a *.urc file containing the images used by the AstroDrive 7072/7152-050. Open the cache file icon and import the cache file.

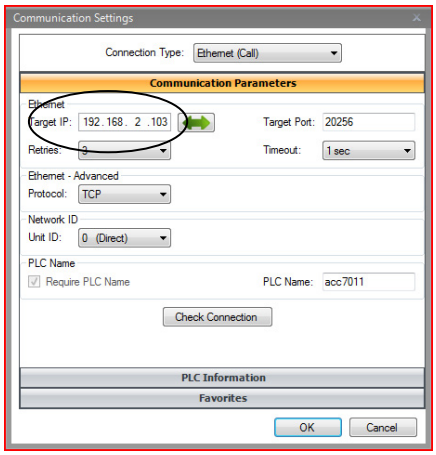
7.3.4. Open the communication settings window.



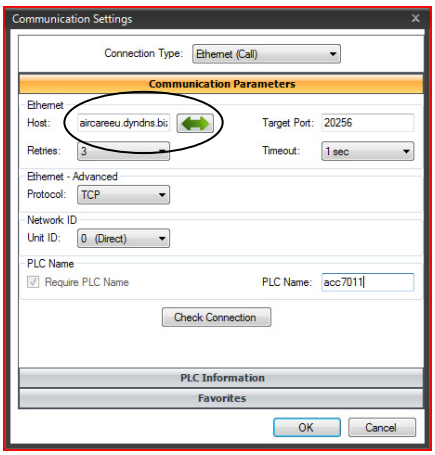
7.3.5. Select ‘Ethernet (call)’ for Connection Type at the top of the settings window.



7.3.6 Enter the IP address of the AstroDrive 7072/7152. Or, a URL can be entered by pressing the green double arrow next to the target IP input. This now becomes the host input. Enter the URL here.

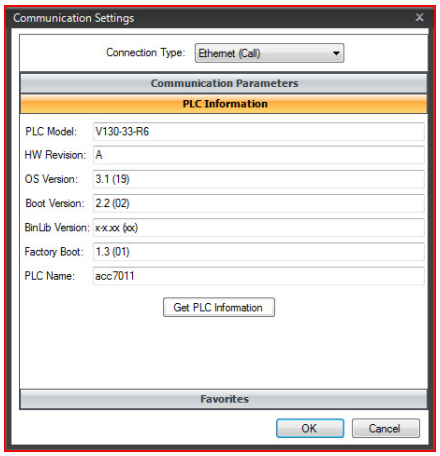


or



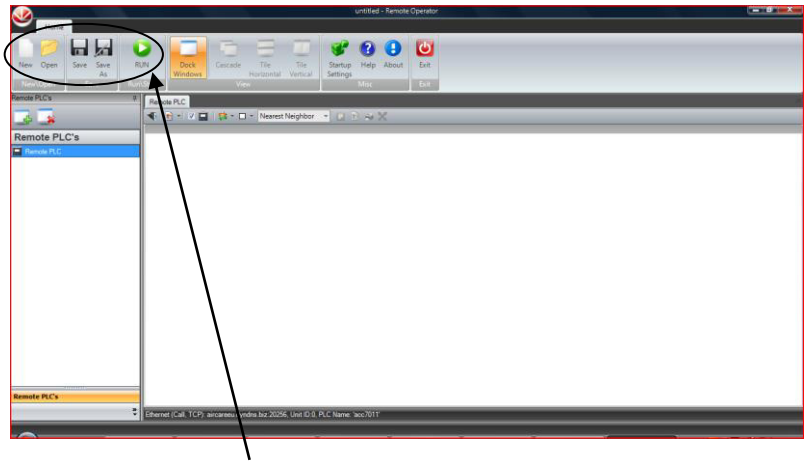
7.3.7 Enter 20256 for the target port. And enter the PLC name. Note: it is necessary to use correct capitalization for this name.

7.3.8 Click on ‘Check Connection’. If the AstroDrive 7072/7152 (PLC) information is displayed, you are connected. If not, then check the settings, the physical connection, and confirm that the PLC is running.



7.3.9 Click on ‘OK’ to close the communication settings window and return to the Remote operator main window.

7.3.10. It is recommended to save the settings via the ‘save’ or ‘save as’ icons. This will allow you to easily re-initializing the comm settings via the ‘open’ icon after restarting the application.



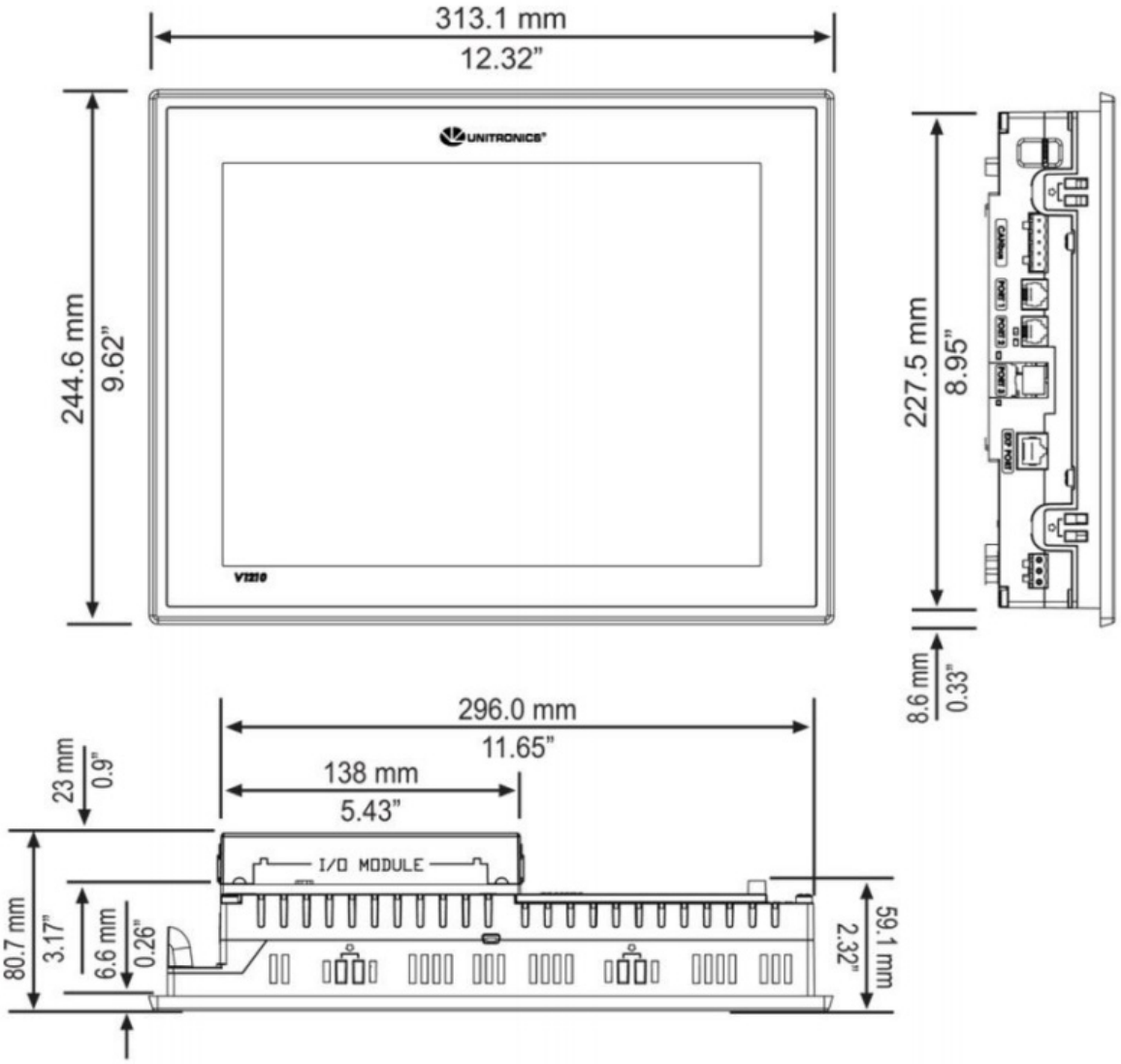
7.3.11. Click on ‘Run’ to start the remote control application.

7.3.12. You are now able to operate the AstroDrive 7072/7152 from your PC as if you were standing in front of the AstroDrive 7072/7152. If you are using a touchscreen, you must press and hold the desired button or touch icon for at least 3.5 seconds.

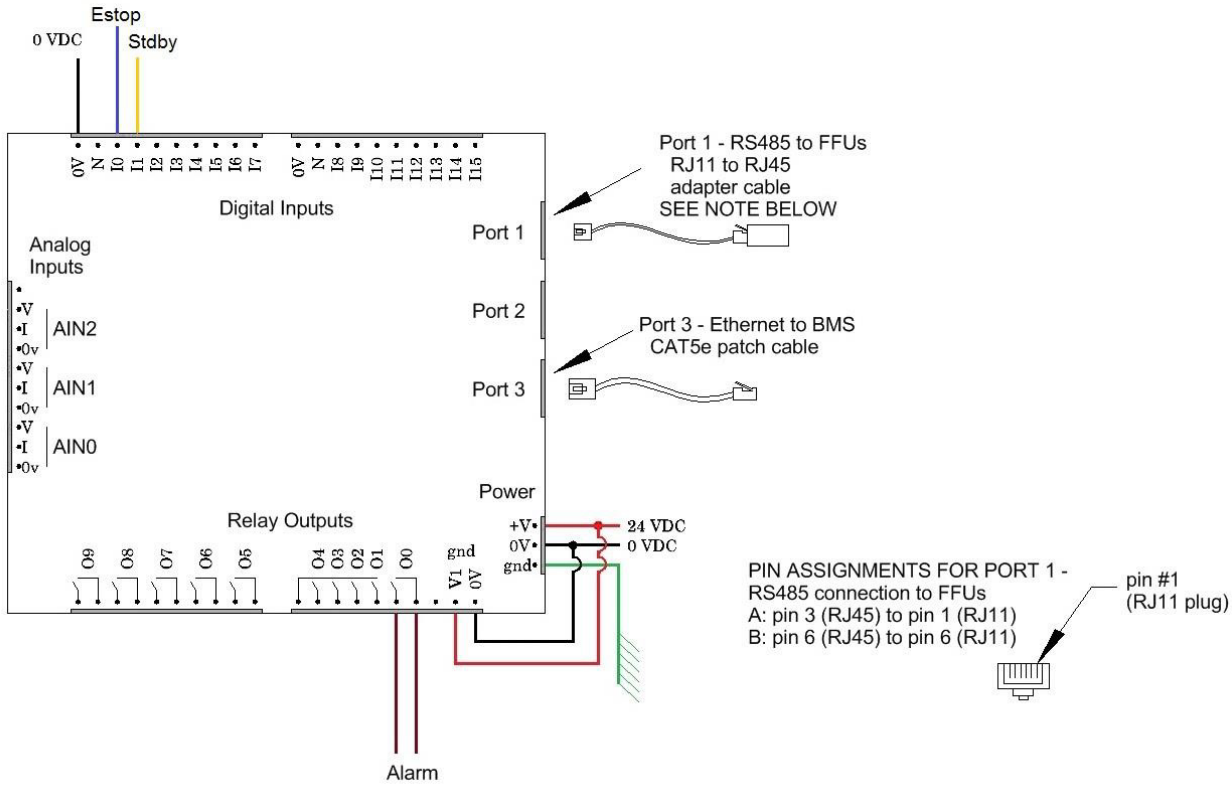
7.3.13. To close the program, click on the “stop” button, then click on “exit”.

8. Installation and wiring diagram

8.1. Panel mount dimensions:



8.2. Wiring diagram:



8.3. AstroDrive 7072/7152 technical specifications

Model number:	V1210-T20BJ
Power supply nominal: 24VDC	
Permissible range:	10.2-28.8VDC
Max. current consumption:	0.5A@24V
Battery back-up:	7 years typical at 25°C
Battery back-up for RTC and system data. Replaceable without opening the controller.	
Graphic Display Screen:	TFT LCD, White LED backlight
Display resolution:	800x600 pixels (SVGA)
Viewing area:	12.1"
Colors:	65,536
Touchscreen:	Resistive, analog

8.4. I/O technical specifications:

Model number:	V200-18-E1B

Relay Outputs (O0-O9)

Output type	SPST-NO relay (Form A), individually isolated
Output current rating	Resistive Load 5A maximum per output 8A maximum total for O1-O4. Inductive Load 1A maximum per output 4A maximum total for O1-O4.
Rated voltage	250VAC / 30VDC
Minimum load	1mA@5VDC
Life expectancy	50k operations at maximum load
Operating voltage	20.4 to 28.8VDC (24 VDC nominal)

Digital Inputs (I0-I15)

Nominal input voltage	24VDC
Input voltage	0-5VDC for Logic ‘0’ 17-28.8VDC for Logic ‘1’
Input current	6mA@24VDC for I4-I15 8.8mA@24VDC for I0-I3

Transistor Outputs (O10p-O13p)

Output type pnp:	P-MOSFET (open drain)
Galvanic isolation:	Yes
Output current pnp:	0.5A maximum (per output)
Total current:	2A maximum (per group)
On voltage drop pnp:	0.5VDC maximum
Short circuit protection:	Yes (pnp only)

Analog inputs (AIN0-AIN2)

Input range:	0-10V
Resolution:	10-bit (1024 units)
Input impedance:	>100KΩ
Galvanic isolation:	None
Absolute maximum rating:	±15V
Full-scale error:	±2 LSB (0.2%)
Linearity error:	±2 LSB (0.2%)