



# Instruction Manual

AVW Controls Ltd

Stage Automation

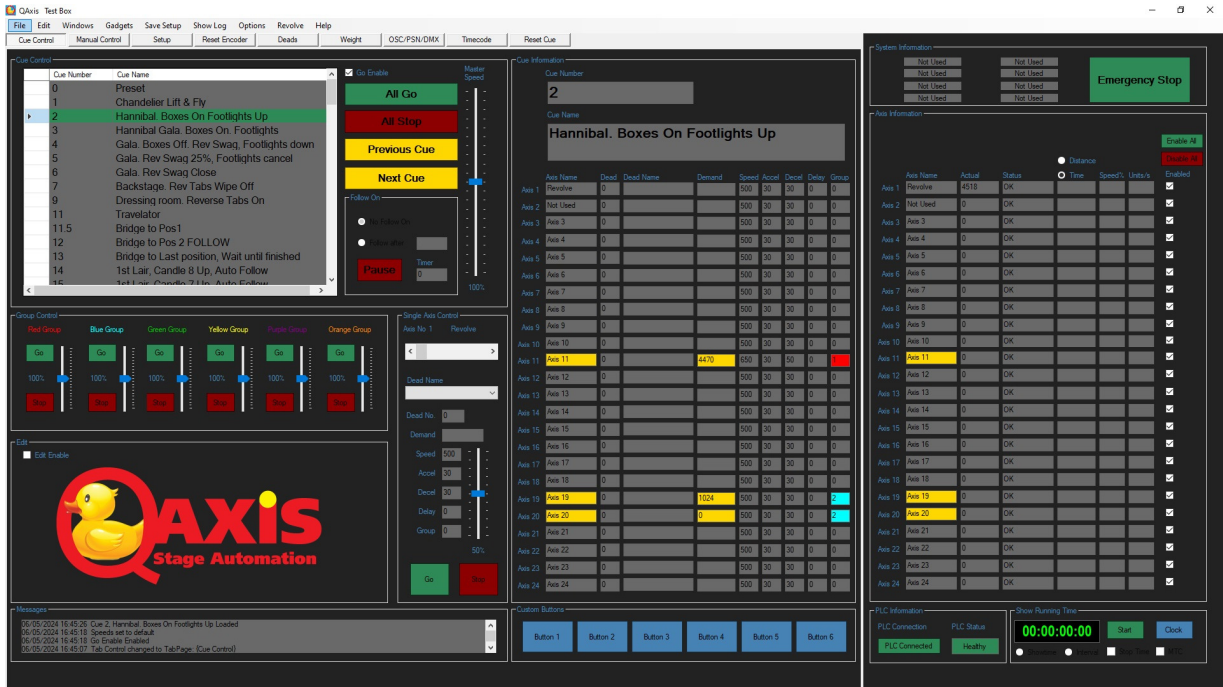
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V11.00

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# Introduction

QAxis® is a stage automation system developed by AVW Controls Ltd specifically for use in the entertainment industry. It is designed to provide reliable and flexible motion control for a wide range of stage applications.



QAxis enables users to create, edit, and run motion control cues through an intuitive and user-friendly interface. The system is designed to streamline both programming and live operation, allowing operators to work efficiently and confidently.

The interface presents all key information—including cues, axes, groups, and editing tools—on a single screen. This allows for rapid transitions between operational and editing environments without disrupting workflow.

QAxis utilises proprietary Omron PLCs (Programmable Logic Controllers) as its core hardware platform. These PLCs are widely used in industrial environments and are known for their reliability, robustness, and global availability. This ensures that AVW can deliver a high-performance, world-class automation system tailored to individual project requirements.

The QAxis software is developed using Microsoft Visual Studio, ensuring modern performance and compatibility.



## General Description

QAxis includes a comprehensive range of features designed to support complex stage automation tasks:

- The system supports a large number of cues, with each cue capable of controlling up to 24 axes simultaneously.
- Up to 128 named “deads” (trims) can be defined and reused across cues and axes.
- Six playback groups allow axes to be controlled together or independently, each with adjustable speed.
- Cues can be linked to create complex automated sequences.
- Real-time display of axis position and status is continuously available.
- Remaining time or distance for movements, along with cue speeds, is always visible.
- Optional weight monitoring with configurable over/under limits (additional hardware required).
- A dedicated revolve interface simplifies programming of rotational movements, including both absolute and relative moves.
- A show log records all operator actions and system errors for diagnostics.
- Safety features include password protection, keyswitch operation, and deadman controls to prevent unintended motion.
- A single-axis controller allows manual control of individual axes during cue execution.
- A manual control page enables direct axis movement for installation and maintenance.
- Compatible with Windows 11 systems featuring Full HD displays and Ethernet connectivity.
- Remote diagnostics are available via internet connection (requires Windows Pro).
- DMX output via sACN enables integration with lighting systems.
- PosiStageNet output allows integration with AV systems (e.g. Disguise D3).
- OSC input enables cue triggering from external systems (e.g. QLab) or other QAxis systems.
- MIDI Timecode (MTC) input supports synchronisation with external controllers.
- Timecode scripting allows cues to be triggered automatically.
- A 3D scene viewer provides animated visualisation of stage elements.
- Axis patching supports up to 24 axes across 6 drives.
- Built-in IP scanner and PSN sniffer assist with system setup and troubleshooting.

# Operation

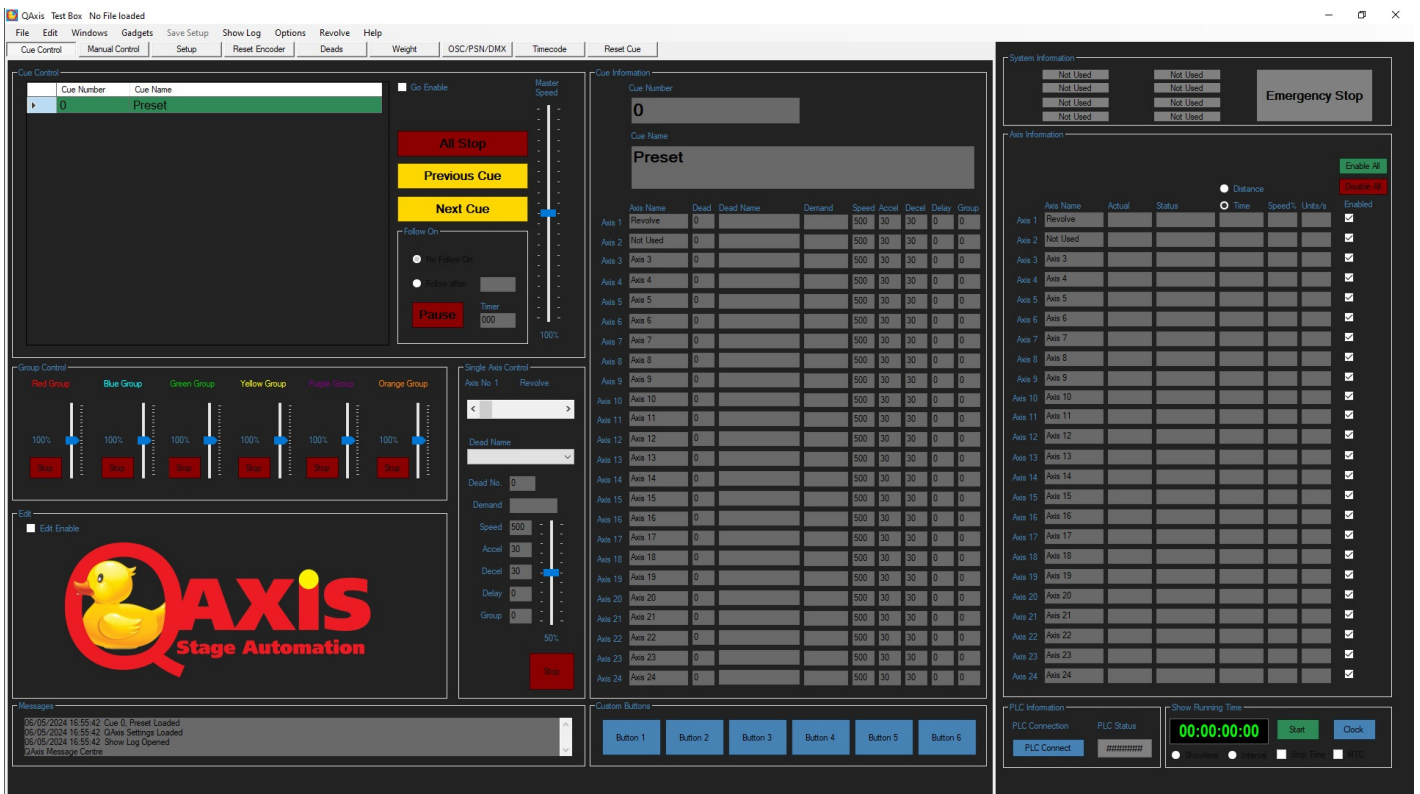
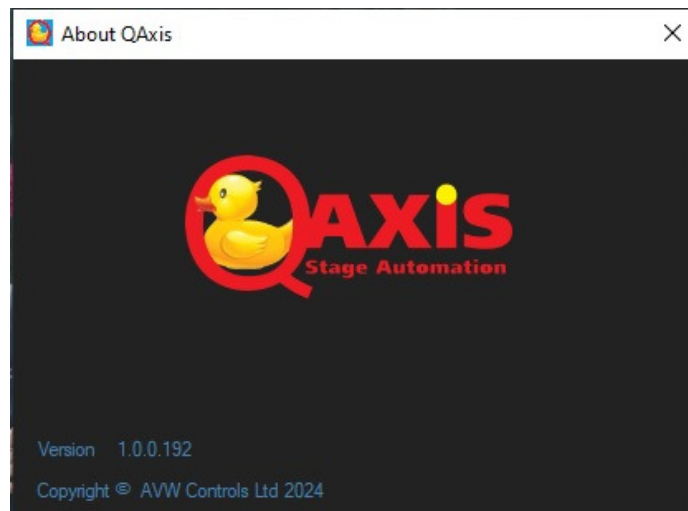
QAxis is a Windows-based application, meaning many of its functions and behaviours will be familiar to users of standard Windows software.

Common file operations—such as **New, Open, Save, Print, and Exit**—function in the same way as other modern applications. For completeness, these functions are described in this manual.

## Start-Up

QAxis is launched in the standard Windows manner, typically by double-clicking the QAxis icon on the desktop.

Upon launch, a splash screen will appear while the software loads. This screen displays the current software version.



Once loading is complete, the main screen will open. At this stage:

- No show file will be loaded
- The system will not yet be connected to the PLC

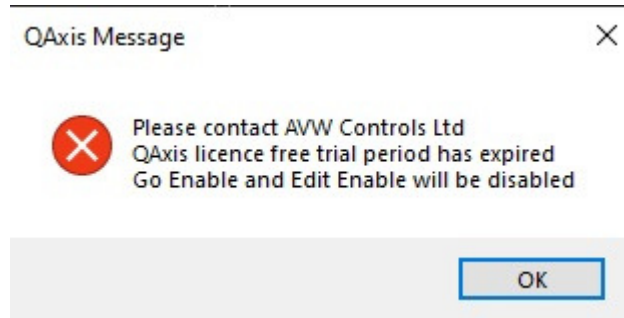
## QAxis Licence Expired — IMPORTANT

If a licence expiry message appears, you must contact AVW Controls Ltd to renew or reset the licence.

- The software will still open
- However, you will **not** be able to run or edit cues

Contact AVW via:

[www.avw.co.uk](http://www.avw.co.uk)



## Connect to the PLC

### Connecting to the PLC

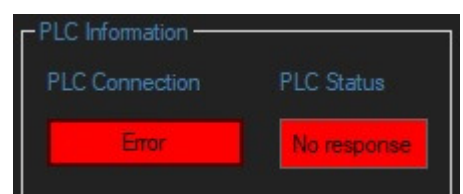
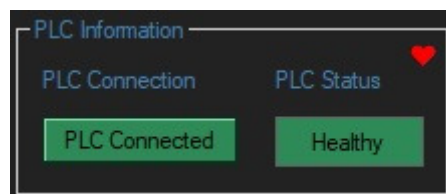
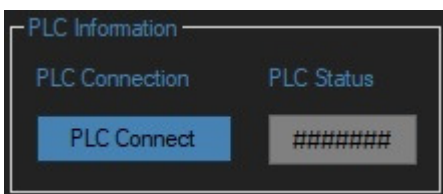
To connect to the PLC, press the **PLC Connect** button.

If the PLC is successfully detected:

- The status indicator will turn **green** and display *“Healthy”*

If the PLC is not detected:

- The status indicator will turn **red** and display *“No Response”*



### Connection Requirements and Notes

- A valid Ethernet port must be selected (usually automatic).
- If the IP address has changed, a communication error may occur.

The correct IP address can be selected via:

- The Setup page
- The IP Scanner tool

Omron communication uses **Port 9000**, which must be:

- Open
- Allowed through firewall/antivirus software

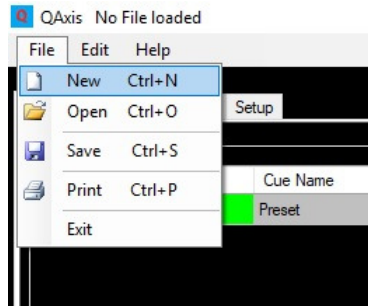
A “heartbeat” signal is continuously sent to the PLC to confirm that the system is being actively monitored.

# The File Menu

The **File menu** is located in the top-left corner of the main screen. From this menu, you can create a new show file, open an existing file, save your work, print cue sheets, or exit the program.

QAxis stores cue data in files with the **.QAX** extension. By default, these files are saved and opened from:  
**C:\QAxis\Shows**

Show files can also be saved to external storage devices such as USB drives.



## File Operations

### New

**Important:** Ensure you save any work you wish to keep before creating a new show file.

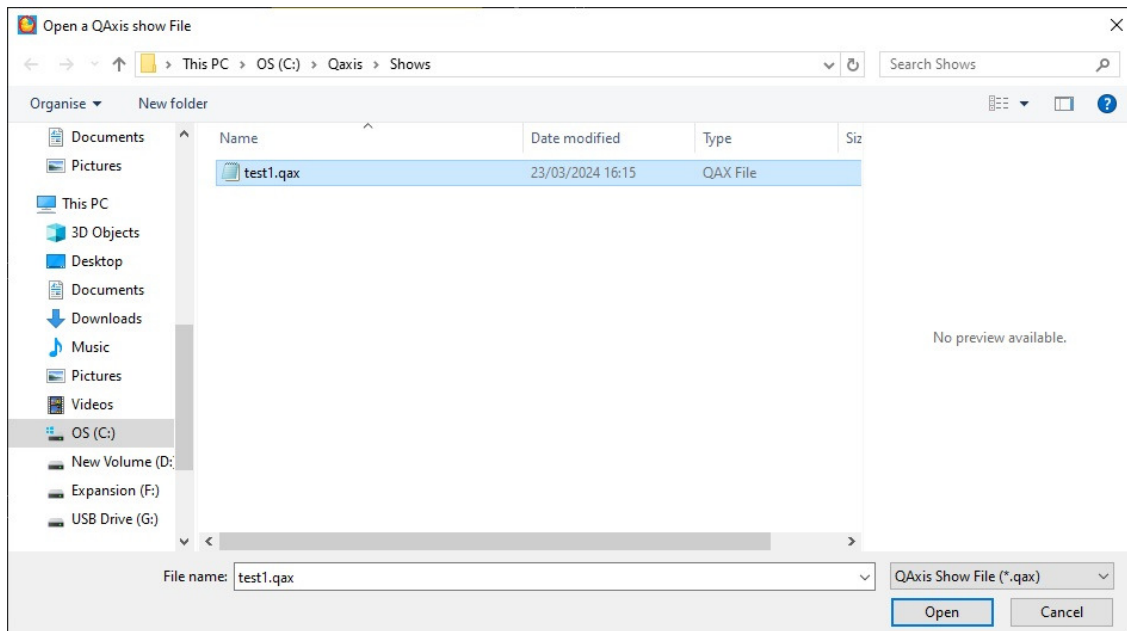
Creating a new file will delete all current cue information (after confirmation). The system will reset to a single cue:

- Cue Number: 0
- Cue Name: *Preset*
- All demand values: cleared
- All other parameters: set to default values

### Open

Opens a file browser to locate and load an existing **.QAX** file.

- Default location: **C:\QAxis\Shows**
- Select a file and click **Open**, or double-click the file
- The selected show file will then be loaded into QAxis



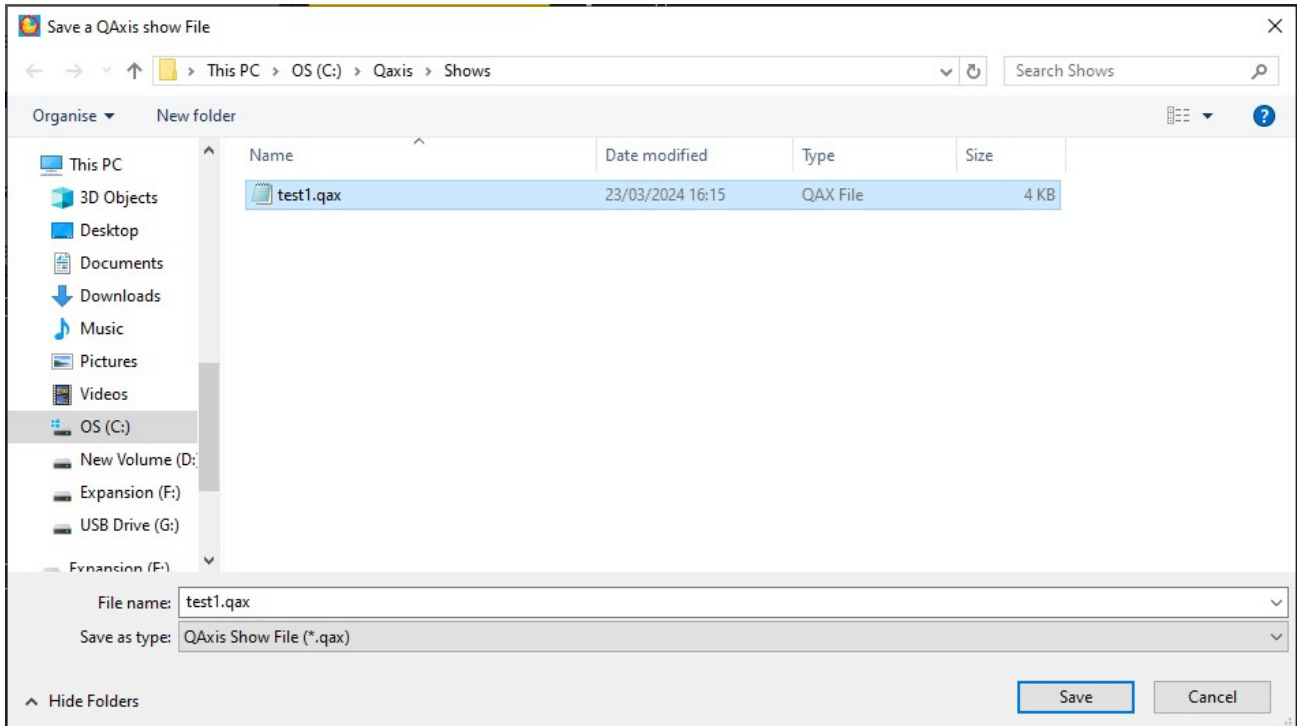
## Save

Opens a file browser to save the current show file.

- Default location: **C:\QAxis\Shows**

You can:

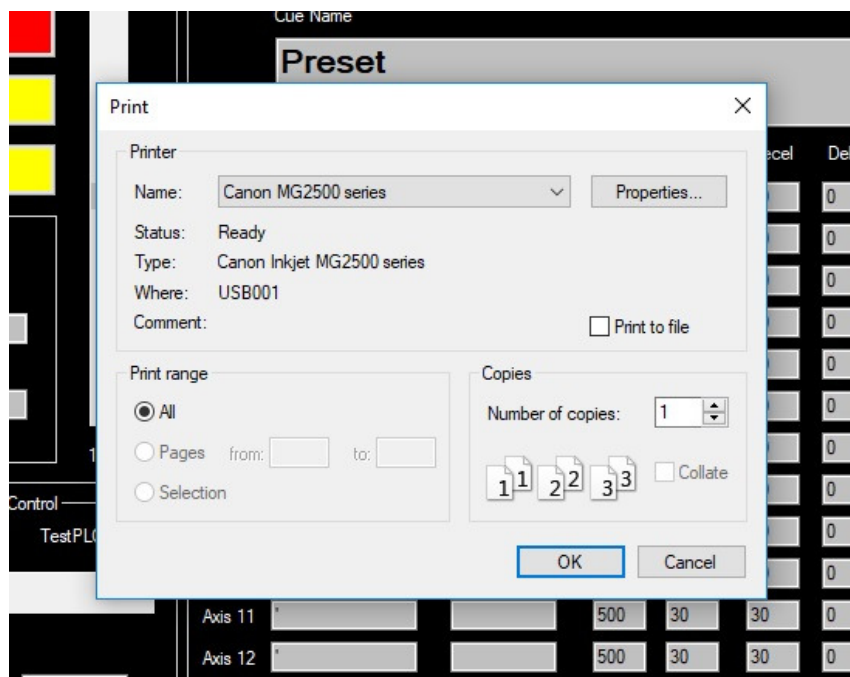
- Overwrite an existing file by selecting it and clicking **Save**
- Create a new file by entering a new filename and clicking **Save**



## Print

Opens the standard printer dialog.

- Each cue is printed on a separate sheet
- Printing options (copies, page range, etc.) are controlled by your printer settings
- Cue sheets are formatted for **A4 portrait orientation**



## Printed Cue Sheet

QAxis by AVW Controls Ltd

Cue Sheet

Show File: C:\Qaxis\QAxis Show Files\Joseph1.qax

Cue number: 0

Cue name: Preset

Axis	Demand	Speed	Accel	Decel	Delay	Dead	Group
Left Leg	0	500	30	30	0	Dead 1	0
Right Leg	0	500	30	30	0	Dead 1	0
Free Leg	0	500	30	30	0	Dead 1	0
Header	0	500	30	30	0	Dead 1	0
Gauze		500	30	30	0	0	0
Footer		500	30	30	0	0	0
Axis 7		500	30	30	0	0	0
Axis 8		500	30	30	0	0	0
Axis 9		500	30	30	0	0	0
Axis 10		500	30	30	0	0	0
Axis 11		500	30	30	0	0	0
Axis 12		500	30	30	0	0	0
Axis 13		500	30	30	0	0	0
Axis 14		500	30	30	0	0	0
Axis 15		500	30	30	0	0	0
Axis 16		500	30	30	0	0	0
Axis 17		500	30	30	0	0	0
Axis 18		500	30	30	0	0	0
Axis 19		500	30	30	0	0	0
Axis 20		500	30	30	0	0	0
Axis 21		500	30	30	0	0	0
Axis 22		500	30	30	0	0	0
Axis 23		500	30	30	0	0	0
Axis 24		500	30	30	0	0	0

## **Printed Cue Sheet**

A printed cue sheet includes:

- Show file name
- Cue number and name
- Axis data, including:
  - Demand
  - Speed
  - Acceleration
  - Deceleration
  - Delay
  - Dead
  - Group

This provides a clear reference for programming and operation.

## Export CSV

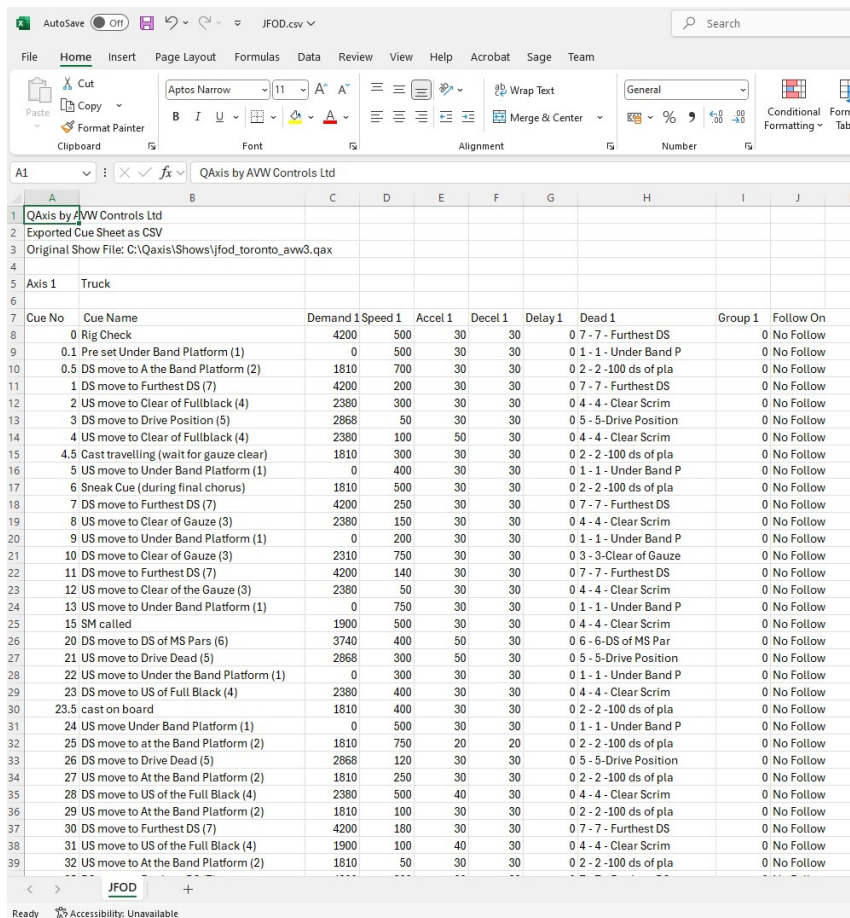
This function exports cue data as a **CSV (Comma-Separated Values)** file.

- Can be opened in Microsoft Excel or similar software
- Useful for:
- Data analysis
- Sharing with third-party automation systems

By default, files are saved to:

**C:\QAxis\Show**

The **Deads** file can also be exported in CSV format.



The screenshot shows an Excel spreadsheet with the following data:

Cue No	Cue Name	Demand	Speed 1	Accel 1	Decel 1	Delay 1	Dead 1	Group 1	Follow On
0	Rig Check	4200	500	30	30		0 7 - 7 - Furthest DS		0 No Follow
0.1	Pre set Under Band Platform (1)	0	500	30	30		0 1 - 1 - Under Band P		0 No Follow
0.5	DS move to A the Band Platform (2)	1810	700	30	30		0 2 - 2 -100 ds of pla		0 No Follow
1	DS move to Furthest DS (7)	4200	200	30	30		0 7 - 7 - Furthest DS		0 No Follow
2	US move to Clear of Fullblack (4)	2380	300	30	30		0 4 - 4 - Clear Scrim		0 No Follow
3	DS move to Drive Position (5)	2868	50	30	30		0 5 - 5-Drive Position		0 No Follow
4	US move to Clear of Fullblack (4)	2380	100	50	30		0 4 - 4 - Clear Scrim		0 No Follow
4.5	Cast travelling (wait for gauze clear)	1810	300	30	30		0 2 - 2 -100 ds of pla		0 No Follow
5	US move to Under Band Platform (1)	0	400	30	30		0 1 - 1 - Under Band P		0 No Follow
6	Sneak Cue (during final chorus)	1810	500	30	30		0 2 - 2 -100 ds of pla		0 No Follow
7	DS move to Furthest DS (7)	4200	250	30	30		0 7 - 7 - Furthest DS		0 No Follow
8	US move to Clear of Gauze (3)	2380	150	30	30		0 4 - 4 - Clear Scrim		0 No Follow
9	US move to Under Band Platform (1)	0	200	30	30		0 1 - 1 - Under Band P		0 No Follow
10	DS move to Clear of Gauze (3)	2310	750	30	30		0 3 - 3-Clear of Gauze		0 No Follow
11	DS move to Furthest DS (7)	4200	140	30	30		0 7 - 7 - Furthest DS		0 No Follow
12	US move to Clear of the Gauze (3)	2380	50	30	30		0 4 - 4 - Clear Scrim		0 No Follow
13	US move to Under Band Platform (1)	0	750	30	30		0 1 - 1 - Under Band P		0 No Follow
15	SM called	1900	500	30	30		0 4 - 4 - Clear Scrim		0 No Follow
20	DS move to DS of MS Pars (6)	3740	400	50	30		0 6 - 6-DS of MS Par		0 No Follow
21	US move to Drive Dead (5)	2868	300	50	30		0 5 - 5-Drive Position		0 No Follow
22	US move to Under the Band Platform (1)	0	300	30	30		0 1 - 1 - Under Band P		0 No Follow
23	DS move to US of Full Black (4)	2380	400	30	30		0 4 - 4 - Clear Scrim		0 No Follow
23.5	cast on board	1810	400	30	30		0 2 - 2 -100 ds of pla		0 No Follow
24	US move Under Band Platform (1)	0	500	30	30		0 1 - 1 - Under Band P		0 No Follow
25	DS move to at the Band Platform (2)	1810	750	20	20		0 2 - 2 -100 ds of pla		0 No Follow
26	DS move to Drive Dead (5)	2868	120	30	30		0 5 - 5-Drive Position		0 No Follow
27	US move to At the Band Platform (2)	1810	250	30	30		0 2 - 2 -100 ds of pla		0 No Follow
28	DS move to US of the Full Black (4)	2380	500	40	30		0 4 - 4 - Clear Scrim		0 No Follow
29	US move to At the Band Platform (2)	1810	100	30	30		0 2 - 2 -100 ds of pla		0 No Follow
30	DS move to Furthest DS (7)	4200	180	30	30		0 7 - 7 - Furthest DS		0 No Follow
31	US move to US of the Full Black (4)	1900	100	40	30		0 4 - 4 - Clear Scrim		0 No Follow
32	US move to At the Band Platform (2)	1810	50	30	30		0 2 - 2 -100 ds of pla		0 No Follow

## Exit

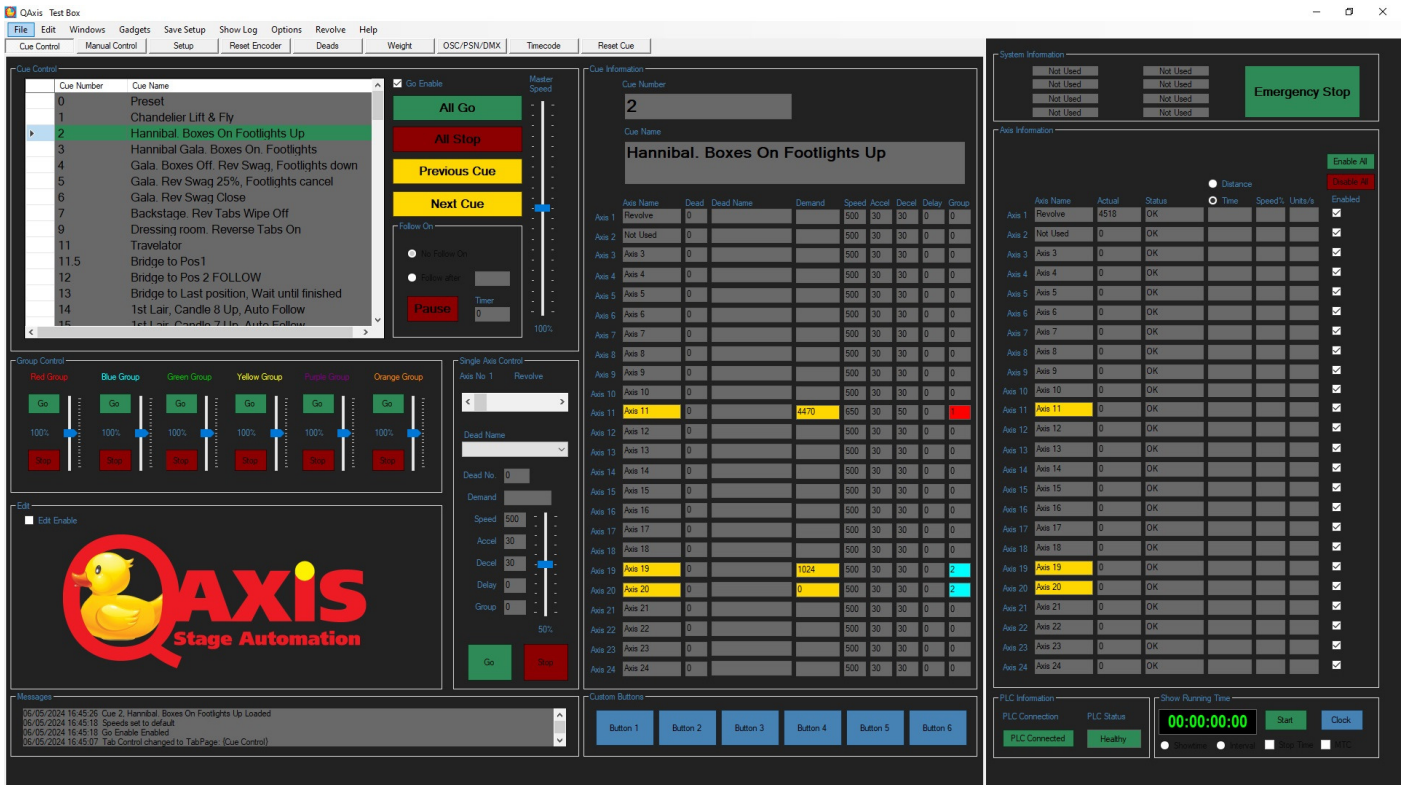
Closes the program.

Before closing, a prompt will appear:

- **Yes** → Opens the Save dialog, then exits
- **No** → Exits without saving
- **Cancel** → Returns to the program without exiting



# Main Screen



## Main Screen

The main screen is divided into several functional windows:

- Cue Control
- Group Control
- Edit
- Single Axis Control
- Cue Information
- Axis Information
- System Information
- PLC Information
- Running Clock / MIDI Timecode display
- Message Centre
- Custom Buttons

Additional pages are accessible via tabs, including:

- Manual Control
- Setup
- Encoder Reset
- Deads
- Weight
- DMX / PSN / OSC
- Reset Cue

## Initial State

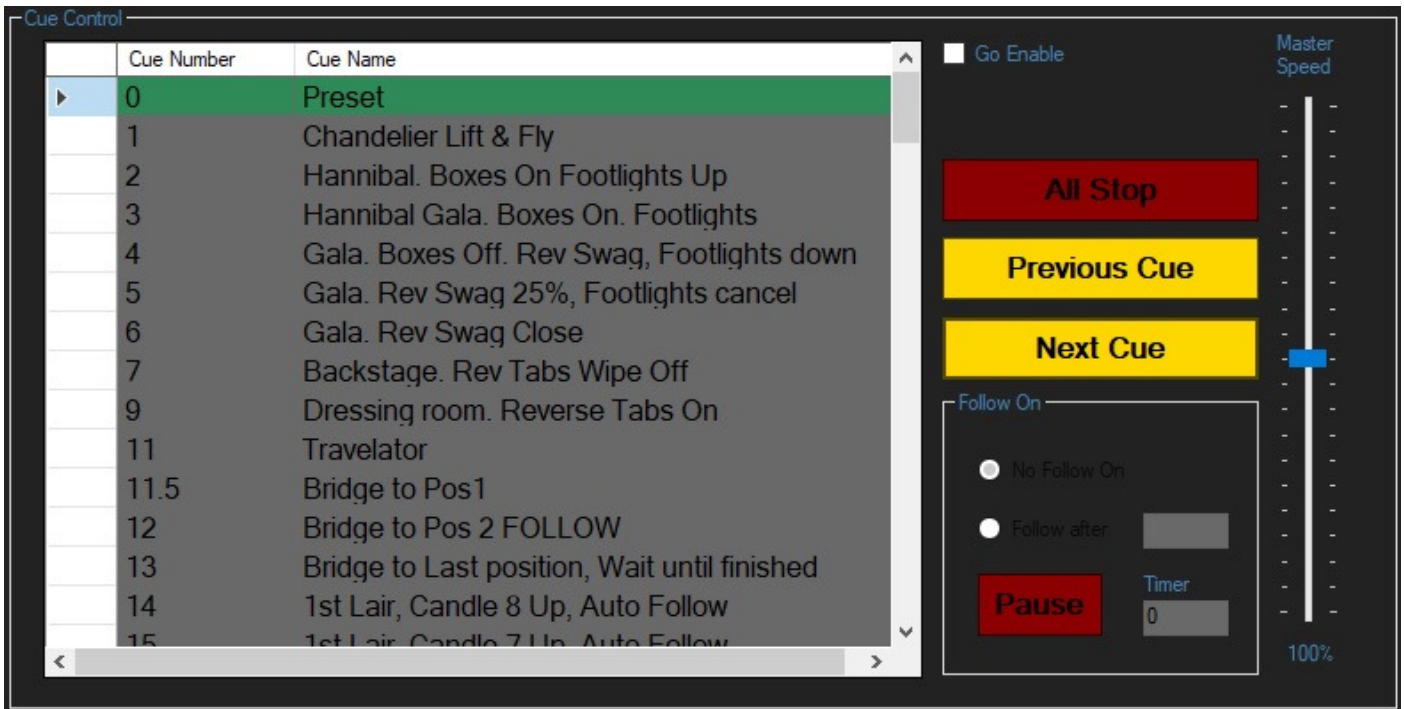
When the main screen is first opened:

- The system is **not connected to the PLC**
- The **PLC Connect** button must be pressed to establish communication

Once connected:

- Axis **Actual positions** and **Status** will be displayed
- System information will populate
- The PLC status indicator will turn **green (Healthy)**

## Cue Control Window



When QAxis is first launched, the **Go button is hidden**.

To enable it:

1. Click the **Go Enable** checkbox
2. Enter the system password (required on first activation)

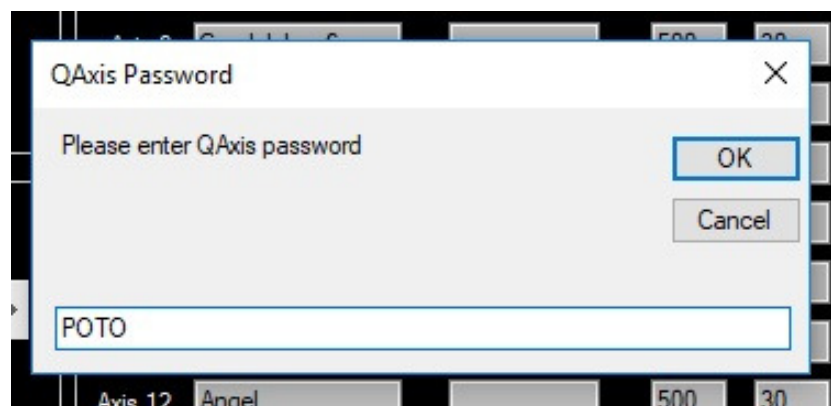
The password is project-specific.

Once the correct password is entered, the **Go button becomes available**.

### Cue Control Functions

The Cue Control window contains:

- Cue list (in numerical order)
- Control buttons:
  - Go
  - Stop
  - Previous Cue
  - Next Cue
  - Follow-On timer
  - Master Speed slider



## Selecting Cues

A cue can be selected by:

- Using **Next / Previous** buttons
- Clicking directly on the cue list
- Using keyboard shortcuts
  
- F1 Go
- F2 Stop
- F3 Next
- F4 Previous
- F5 Pause
- F6 Master Speed Faster
- F7 Master Speed Slower

## Running a Cue

Pressing **Go** will:

- Start all axes with valid demands (highlighted in yellow in the Cue Information window)

While moving:

- Status displays **“Positioning”**
- Actual position updates in real time
- Remaining time or distance is shown
- Speed is displayed (may be affected by master or group speed controls)

Speed Behaviour Notes

- Speed is shown in **units per second**
- If displayed in **pink**, the move is too short to achieve full programmed speed
- The system will automatically reduce speed (creep mode)
- This ensures the target position is not overshoot

Pink values are normal near the end of a move

Axis	Axis Name	Dead	Dead Name	Demand	Speed	Accel	Decel	Delay	Group	Axis	Axis Name	Actual	Status	Time	Speed%	Units/s	Enabled
Axis 1	Left Leg	1	Dead 1	0	500	30	30	0	0	Axis 1	Left Leg	461	Positioning	2.1	50.0%	774	<input checked="" type="checkbox"/>

## Completion of Movement

When a move completes:

1. Status briefly changes to **“At Position”** (yellow)
2. Then returns to **“OK”** (grey), indicating readiness for the next command

Axis	Axis Name	Actual	Status	Time	Speed%	Units/s	Enabled
Axis 1	Test 1	3500	At Position	0.0	50.0%	950	<input checked="" type="checkbox"/>

Axis	Axis Name	Actual	Status	Time	Speed%	Units/s	Enabled
Axis 1	Test 1	3500	OK	0.0	50.0%	950	<input checked="" type="checkbox"/>

## Cue Information Window

Cue Information									
Cue Number									
0									
Cue Name									
Preset									
	Axis Name	Dead	Dead Name	Demand	Speed	Accel	Decel	Delay	Group
Axis 1	Left Leg	1	Dead 1	0	500	30	30	0	0
Axis 2	Right Leg	1	Dead 1	0	500	30	30	0	0
Axis 3	Free Leg	1	Dead 1	0	500	30	30	0	0
Axis 4	Header	1	Dead 1	0	500	30	30	0	0
Axis 5	Gauze	0			500	30	30	0	0
Axis 6	Footer	0			500	30	30	0	0
Axis 7	Axis 7	0			500	30	30	0	0
Axis 8	Axis 8	5	Dead 5	0	500	30	30	0	0
Axis 9	Axis 9	0			500	30	30	0	0
Axis 10	Axis 10	0			500	30	30	0	0
Axis 11	Axis 11	0			500	30	30	0	0
Axis 12	Axis 12	0			500	30	30	0	0
Axis 13	Axis 13	0			500	30	30	0	0
Axis 14	Axis 14	0			500	30	30	0	0
Axis 15	Axis 15	0			500	30	30	0	0
Axis 16	Axis 16	0			500	30	30	0	0
Axis 17	Axis 17	0			500	30	30	0	0
Axis 18	Axis 18	0			500	30	30	0	0
Axis 19	Axis 19	0			500	30	30	0	0
Axis 20	Axis 20	0			500	30	30	0	0
Axis 21	Axis 21	0			500	30	30	0	0
Axis 22	Axis 22	0			500	30	30	0	0
Axis 23	Axis 23	0			500	30	30	0	0
Axis 24	Axis 24	0			500	30	30	0	0

The Cue Information window displays all data for the currently selected cue.

- Any **yellow-highlighted demand** indicates an axis that will move when **Go** is pressed
- Displayed parameters include:

- Demand
- Speed
- Acceleration
- Deceleration
- Delay
- Group
- Dead

### Additional Information

- Current cue number and name are displayed
- Follow-On status is shown if programmed
- Deads can be selected via a dropdown when in Edit mode

### Out-of-Limit Warning

If a demand field is shown in **red**:

- The value exceeds system soft limits
- The axis will move toward the demand
- Movement will stop at the configured limit

# Cue Information Window

## Cue Parameter Definitions

### Demand

- Typically in millimetres (or hundredths of a degree for revolves)
- Range: -9,999,999 to 99,999,999
- Value -1 = Null

### Speed

- Percentage with implied decimal (e.g. 567 = 56.7%)

### Acceleration (Accel)

- Time to reach full speed (tenths of a second)
- Example: 30 = 3 seconds

### Deceleration (Decel)

- Time to reduce from full speed to zero
- Same format as Accel

### Delay

- Wait time before movement begins (tenths of a second)
- Status shows **“Waiting”** during delay

### Group

- 0 = no group
- 1-6 correspond to:
- Red, Blue, Green, Yellow, Purple, Orange

### Dead

- Range: 0-128
- 0 = no dead

Axis Name	Dead	Dead Name	Demand	Speed	Accel	Decel	Delay	Group
Axis 1 Left Leg	1	Dead 1	0	500	30	30	100	2

Axis Name	Actual	Status	Time	Speed%	Units/s	Enabled
Axis 1 Left Leg	512	Waiting	2.2	50.0%	774	<input checked="" type="checkbox"/>

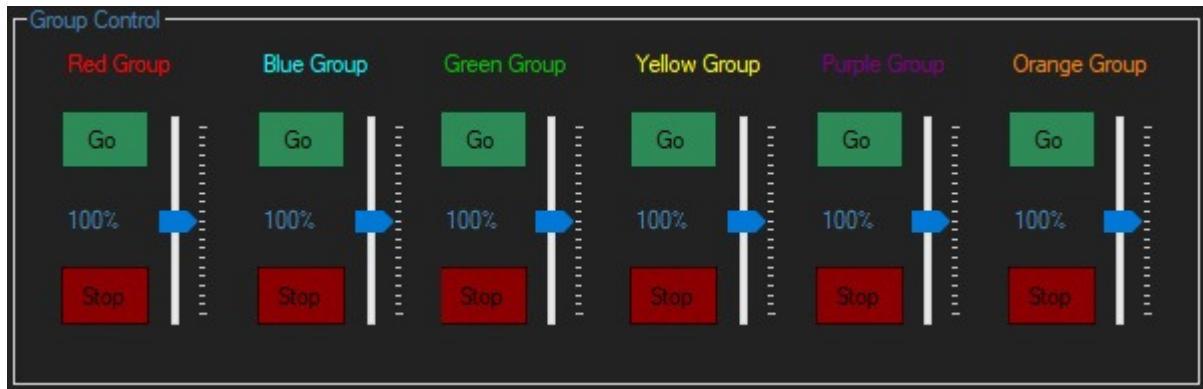
Axis Name	Dead	Dead Name	Demand	Speed	Accel	Decel	Delay	Group
Axis 1 Left Leg	1	Dead 1	0	500	30	30	0	1
Axis 2 Right Leg	1	Dead 1	0	500	30	30	0	2
Axis 3 Free Leg	1	Dead 1	0	500	30	30	0	3
Axis 4 Header	1	Dead 1	0	500	30	30	0	4
Axis 5 Gauze	0			500	30	30	0	5
Axis 6 Footer	0			500	30	30	0	6

### Special Dead Values

- 129 → Relative moves (commonly used for revolves)
- 130-999 → Custom project-specific functions
- e.g. axis interlocks or synchronisation

Axis Name	Dead	Dead Name	Demand	Speed	Accel	Decel	Delay	Group
Axis 1 Truck	129	Relative Mode	1000	500	30	30	0	0

## Group Control Window



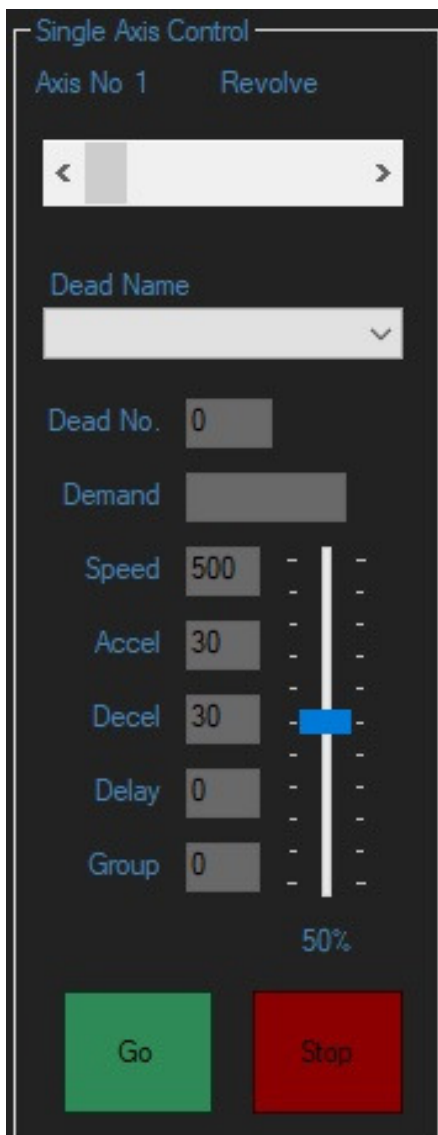
The Group Control window allows grouped axis control within cues.

Six groups available:

- Red, Blue, Green, Yellow, Purple, Orange

Each group can:

- Start (Go)
- Stop
- Adjust speed independently
- Axes can be assigned to groups per cue.



## Single Axis Control Window

This window allows manual control of a single axis independently of cues.

- Axis is selected via a horizontal scroll bar
- Parameters match those in the Cue Information window
- Controls affect **only the selected axis**

This is useful for:

- Quick adjustments
- Testing
- Situations where creating a cue is unnecessary

# Axis Information Window

Displays real-time information for all axes:

- Axis name
- Actual position
- Status
- Remaining time or distance
- Speed (%) and units

Axis Enable / Disable

- Disabled axes will **not respond to Go commands**
- Disabling does **not stop** an axis already in motion
- A disabled axis will still respond to a **Stop command**

Axis Information							
							Enable All
							Disable All
							Enabled
	Axis Name	Actual	Status	<input type="radio"/> Distance <input type="radio"/> Time	Speed%	Units/s	
Axis 1	Test 1	2135	Positioning	3.9	87.2%	1657	<input checked="" type="checkbox"/>
Axis 2	Test 2	0	OK				<input checked="" type="checkbox"/>
Axis 3	Test 3	0	OK				<input checked="" type="checkbox"/>
Axis 4	Test 4	0	OK				<input checked="" type="checkbox"/>
Axis 5	Axis 5	0	OK				<input checked="" type="checkbox"/>
Axis 6	Axis 6	0	OK				<input checked="" type="checkbox"/>
Axis 7	Axis 7	0	OK				<input checked="" type="checkbox"/>
Axis 8	Axis 8	0	OK				<input checked="" type="checkbox"/>
Axis 9	Axis 9	0	OK				<input checked="" type="checkbox"/>
Axis 10	Axis 10	0	OK				<input checked="" type="checkbox"/>
Axis 11	Axis 11	0	OK				<input checked="" type="checkbox"/>
Axis 12	Axis 12	0	OK				<input checked="" type="checkbox"/>
Axis 13	Axis 13	0	OK				<input checked="" type="checkbox"/>
Axis 14	Axis 14	0	OK				<input checked="" type="checkbox"/>
Axis 15	Axis 15	0	OK				<input checked="" type="checkbox"/>
Axis 16	Axis 16	0	OK				<input checked="" type="checkbox"/>
Axis 17	Axis 17	0	OK				<input checked="" type="checkbox"/>
Axis 18	Axis 18	0	OK				<input checked="" type="checkbox"/>
Axis 19	Axis 19	0	OK				<input checked="" type="checkbox"/>
Axis 20	Axis 20	0	OK				<input checked="" type="checkbox"/>
Axis 21	Axis 21	0	OK				<input checked="" type="checkbox"/>
Axis 22	Axis 22	0	OK				<input checked="" type="checkbox"/>
Axis 23	Axis 23	0	OK				<input checked="" type="checkbox"/>
Axis 24	Axis 24	0	OK				<input checked="" type="checkbox"/>

# Axis Information Window

## Status Indicators

- **OK (Grey)** → Ready
- **Positioning (Green)** → Moving
- **No Comms (Red)** → Communication lost

If communication with the PLC fails:

- All axes display **“No Comms”**
- No commands will be accepted

Common causes:

- PLC powered off
- Ethernet disconnected
- Incorrect IP address

The screenshot shows the 'Axis Information' window with a dark background. At the top right, there are two buttons: 'Enable All' (green) and 'Disable All' (red). Below these are radio buttons for 'Distance' (selected) and 'Time'. The main table has columns for 'Axis Name', 'Actual', 'Status', 'Speed%', and 'Units/s'. The 'Status' column for all 24 axes is red and contains the text 'No Comms'. The 'Enabled' column has a checked checkbox for every axis. The 'Axis Name' column lists 'Revolve' for Axis 1 and 'Not Used' for Axis 2, with 'Axis 3' through 'Axis 24' following a sequential pattern.

Axis	Axis Name	Actual	Status	Speed%	Units/s	Enabled
Axis 1	Revolve		No Comms			<input checked="" type="checkbox"/>
Axis 2	Not Used		No Comms			<input checked="" type="checkbox"/>
Axis 3	Axis 3		No Comms			<input checked="" type="checkbox"/>
Axis 4	Axis 4		No Comms			<input checked="" type="checkbox"/>
Axis 5	Axis 5		No Comms			<input checked="" type="checkbox"/>
Axis 6	Axis 6		No Comms			<input checked="" type="checkbox"/>
Axis 7	Axis 7		No Comms			<input checked="" type="checkbox"/>
Axis 8	Axis 8		No Comms			<input checked="" type="checkbox"/>
Axis 9	Axis 9		No Comms			<input checked="" type="checkbox"/>
Axis 10	Axis 10		No Comms			<input checked="" type="checkbox"/>
Axis 11	Axis 11		No Comms			<input checked="" type="checkbox"/>
Axis 12	Axis 12		No Comms			<input checked="" type="checkbox"/>
Axis 13	Axis 13		No Comms			<input checked="" type="checkbox"/>
Axis 14	Axis 14		No Comms			<input checked="" type="checkbox"/>
Axis 15	Axis 15		No Comms			<input checked="" type="checkbox"/>
Axis 16	Axis 16		No Comms			<input checked="" type="checkbox"/>
Axis 17	Axis 17		No Comms			<input checked="" type="checkbox"/>
Axis 18	Axis 18		No Comms			<input checked="" type="checkbox"/>
Axis 19	Axis 19		No Comms			<input checked="" type="checkbox"/>
Axis 20	Axis 20		No Comms			<input checked="" type="checkbox"/>
Axis 21	Axis 21		No Comms			<input checked="" type="checkbox"/>
Axis 22	Axis 22		No Comms			<input checked="" type="checkbox"/>
Axis 23	Axis 23		No Comms			<input checked="" type="checkbox"/>
Axis 24	Axis 24		No Comms			<input checked="" type="checkbox"/>

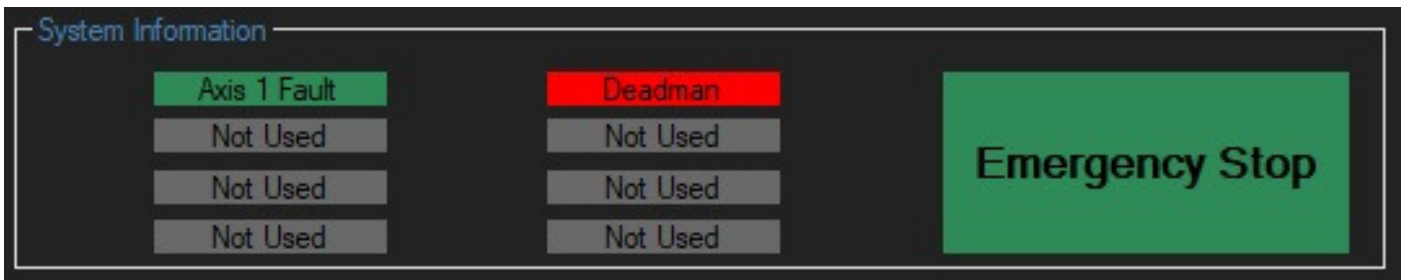
## Axis Information Window

The **Status** field provides real-time feedback on axis conditions using colour-coded messages:

- **Yellow** – “**At Position**” Displayed briefly when an axis reaches its target position.
- **Orange** – “**Waiting**” Indicates a programmed delay before movement begins.
- **Black** – **No message** Axis is disabled via the **Enabled checkbox**. → The axis will not respond to Go commands.
- **Blue** – “**Disabled**” Axis is disabled via a **hardware input** (e.g. Emergency Stop or Deadman).
- **Red** – “**High Limit**” High limit switch activated. → Movement stops in the high direction.
- **Red** – “**Low Limit**” Low limit switch activated. → Movement stops in the low direction.
- **Red** – “**Ultimate Limit**” Ultimate limit switch activated. → Movement stops in both directions.
- **Red** – “**Overload**” Overload signal missing for more than one second. → Movement stops in the high direction.
- **Red** – “**Underload**” Underload signal missing for more than one second. → Movement stops in the low direction.
- **Red** – “**Encoder Fault**” Encoder signal missing for more than one second. → Actual position display turns dark green → Manual movement at creep speed is still possible

Axis	Axis Name	Actual	Status	Time	Speed%	Units/s	Enabled
Axis 1	Test 1	3500	At Position	0.0	50.0%	950	<input checked="" type="checkbox"/>
Axis 1	Test 1	3009	Waiting	4.4	87.2%	1657	<input checked="" type="checkbox"/>
Axis 1	Test 1	0	Disabled	4.4	87.2%	1657	<input type="checkbox"/>
Axis 1	Test 1	8	Disabled	4.4	61.3%	1165	<input checked="" type="checkbox"/>
Axis 1	Test 1	3009	High Limit	2.5	50.0%	950	<input checked="" type="checkbox"/>
Axis 1	Test 1	0	Low Limit	0.0	87.2%	1657	<input checked="" type="checkbox"/>
Axis 1	Test 1	3009	Ultimate Limit	4.4	87.2%	1657	<input checked="" type="checkbox"/>
Axis 1	Test 1	0	Overload	0.0	87.2%	1657	<input checked="" type="checkbox"/>
Axis 1	Test 1	3009	Underload	4.4	87.2%	1657	<input checked="" type="checkbox"/>
Axis 1	Test 1	2	Encoder Fault	4.4	61.3%	1165	<input checked="" type="checkbox"/>

## System Information Window



The System Information window displays:

- **Eight configurable status indicators**
- **Emergency Stop indicator**

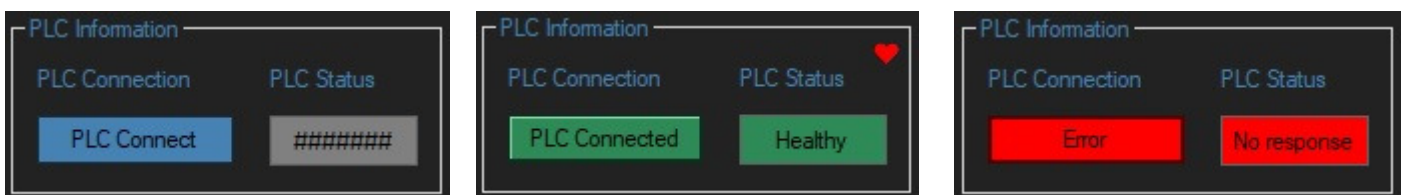
These indicators are defined during system commissioning.

- **Green** → Condition is safe for movement
- **Red** → Condition prevents movement

The **Emergency Stop indicator** behaves similarly:

- Green → Movement allowed
- Red → Movement inhibited

## PLC Information Window



This window shows communication status between the PC and the PLC.

Status Indicators

- **Green – “Healthy”** → Communication is active → PLC is ready to accept commands
- **Flashing Green – “Healthy”** → PLC battery is low and requires replacement
- **Dark Green – “Busy”** → PLC is communicating but currently processing
- **Red – “Error / No Response”** → No communication with PLC
- A Heartbeat is sent to the PLC to ensure that the QAxis software is in constant communication

## Edit Window

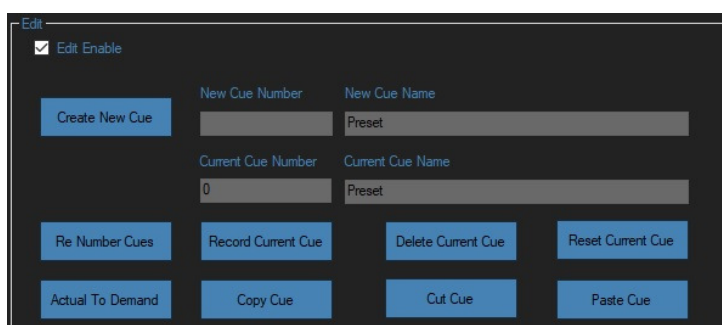


The Edit window is accessed by selecting the **Edit Enable** checkbox.

- If Go Enable is not already active, a **password is required**
- If Go Enable is active, it will be **disabled when Edit Enable is selected**

### Important:

Go Enable and Edit Enable are **mutually exclusive**.



### Creating a New Cue

To create a new cue:

1. Enter a **unique cue number**  
Up to 7 digits (including decimal point)  
Supports very large cue ranges 9,999,999
2. Enter a **cue name**  
If left blank, a default name will be generated (e.g. Q1.0)
3. The cue will automatically appear in the cue list in numerical order
4. Enter required data in the Cue Information window
5. Click **Record Current Cue** to store the cue (session only)

### Default Values

New cues are pre-filled with default values for:

- Speed
- Acceleration
- Deceleration
- Delay
- Group
- Dead

These can be overwritten as required.

### Editing Cue Data

All cue parameters can be edited directly in the Cue Information window

Data can be:

- Copied
- Cut
- Pasted
- Transferred between cues

This allows fast and efficient programming.

### Additional Edit Functions

- **Delete Current Cue** Removes the selected cue
- **Reset Current Cue** Clears all data for the selected cue
- **Copy / Cut / Paste Cue** Allows duplication and reorganisation of cues
- **Re-Number Cues** Converts decimal cue numbers to whole integers

# Deads

The **Deads** page is accessed via the tab control.

- Up to **128 deads** can be defined

Each dead has:

- A name
- A value

Dead File Behaviour

A default dead file is loaded automatically at startup

Multiple dead files can be:

- Created
- Saved
- Loaded

If no default file is found: All dead values revert to **zero (factory default)**

Using Deads

Deads are selected via dropdown menus in Edit mode

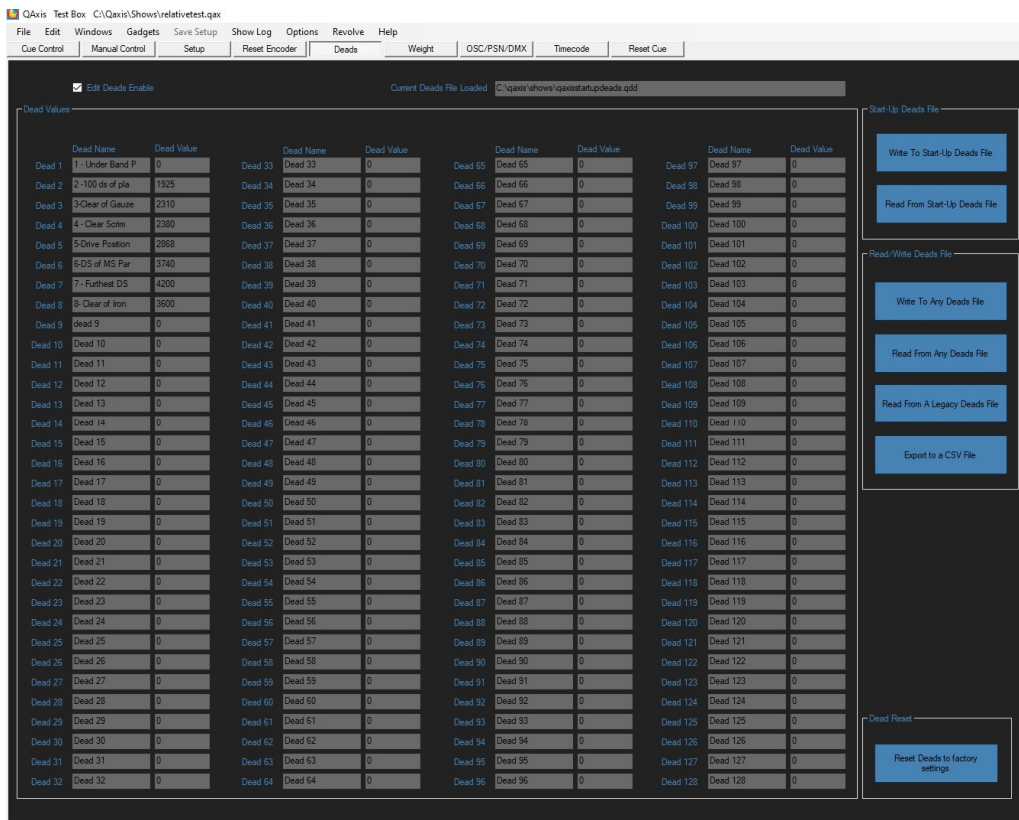
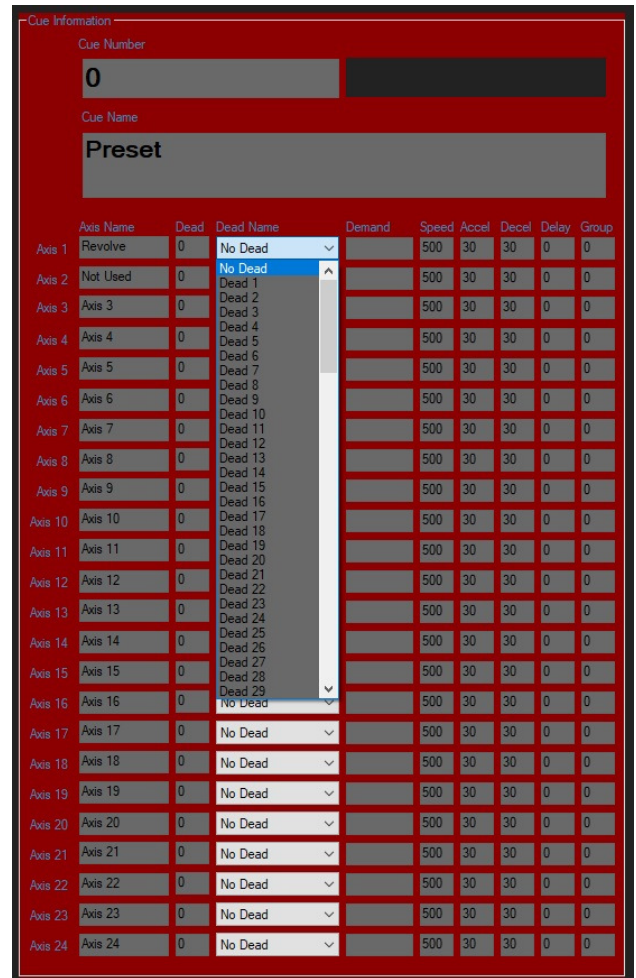
- Any dead can be reused across:
- Multiple cues
- Multiple axes

Editing Deads

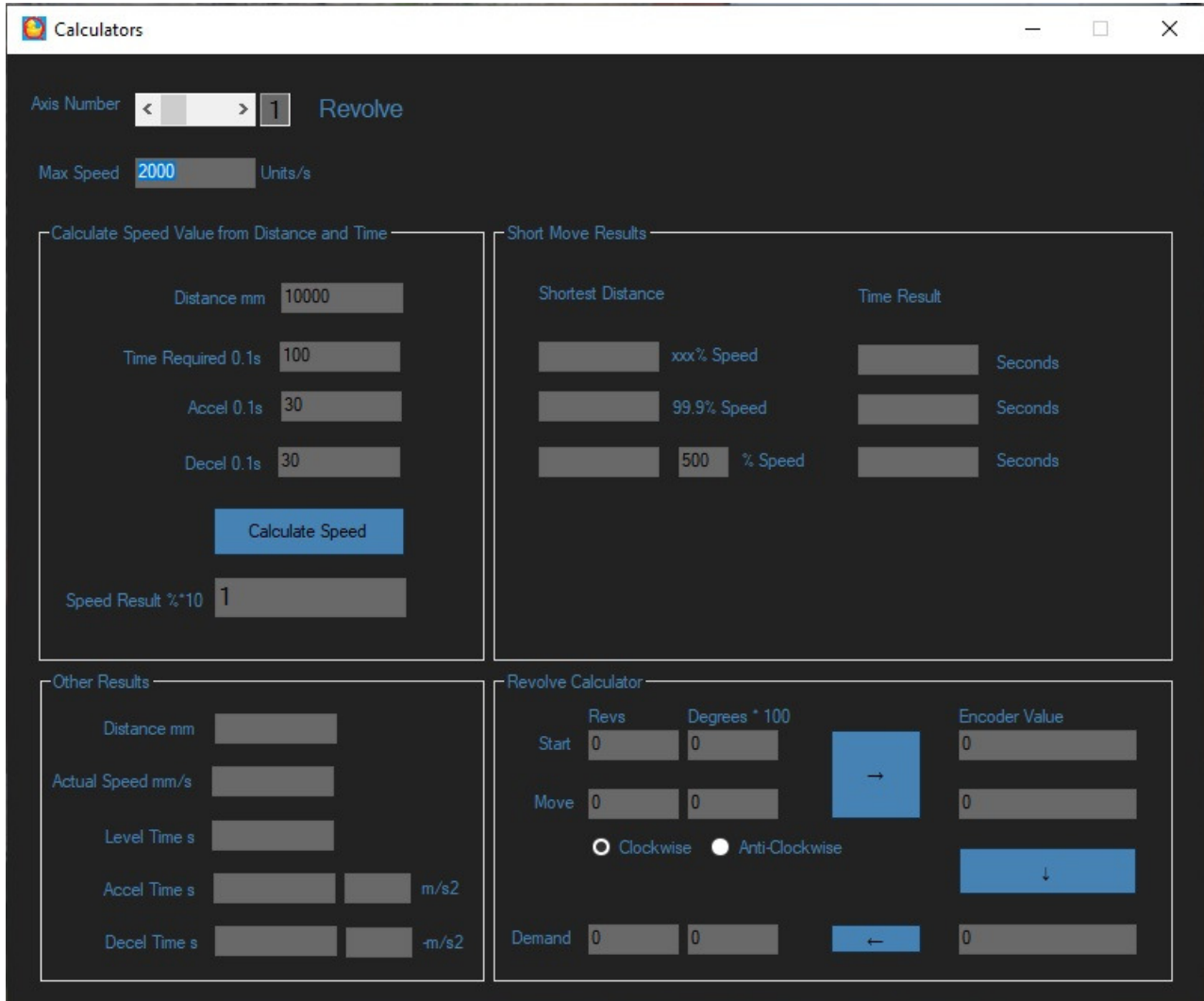
If a dead value or name is changed:

- All cues using that dead are automatically updated

This allows efficient global changes without editing each cue individually.



# Calculators



Calculators are accessed from the **Gadgets menu**.

They assist with determining correct motion parameters.

## Speed Calculator

Calculates required speed for a movement based on:

- Distance
- Time
- Acceleration
- Deceleration

Requirements:

- A valid **max speed file** must be configured
- Otherwise, the calculator will display **“undefined”**

## Input Units

- Distance → millimetres (or degrees for revolves)
- Time → tenths of a second (e.g. 100 = 10 seconds)
- Accel/Decel → tenths of a second

## Results

- Displays calculated speed if achievable
- Can be copied into cue data
- Provides additional useful motion data

## Short Move Calculator

Calculates the shortest achievable move using:

- Speed
- Acceleration
- Deceleration

Used for analysing short-distance movements.

## Revolve Calculator

Simplifies rotational calculations:

- Converts:
- Revolutions
- Degrees → into encoder counts

# Manual Page

The Manual page is accessed via the tab control.

It provides **direct manual control of up to 24 axes**.

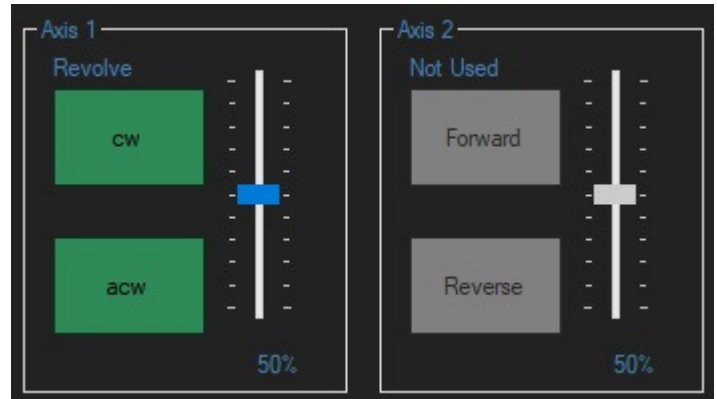
## Display Behaviour

- Disabled axes are hidden
- Unused axes are greyed out
- System, axis, and PLC information remain visible.

## Manual Controls

Each axis includes:

- Forward button
- Reverse button
- Speed control slider
- Default speed = **50%**
- Speed changes apply to:
  - Touchscreen controls
  - Physical controls

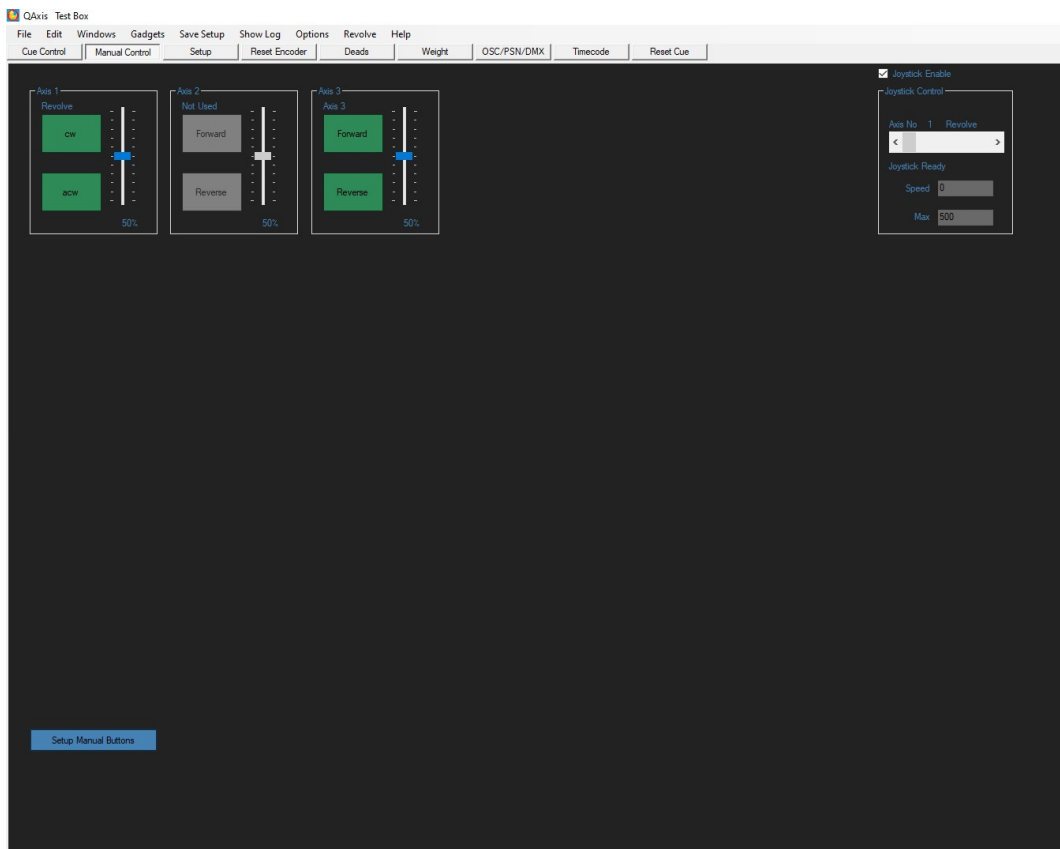


## Additional Features

Axis movement will stop at:

- Soft limits
- Hard limits
- USB joystick control is supported for single-axis operation

Button labels can be customised via the Setup page



# Setup Page

The Setup page allows configuration of system parameters.

## Warning:

This page should only be used by trained personnel.

## Configurable Parameters

- Axis names
- System status labels
- Custom button names
- Soft limits
- IP addresses
- Node numbers
- Speed references
- Software expiry date

The screenshot displays the QAxis Setup Page interface. At the top, there is a menu bar with options: File, Edit, Windows, Gadgets, Save Setup, Show Log, Options, Revolve, Help. Below the menu bar are several tabs: Cue Control, Manual Control, Setup (selected), Reset Encoder, Deads, Weight, OSC/PSN/DMX, Timecode, and Reset Cue.

The main interface is divided into several panels:

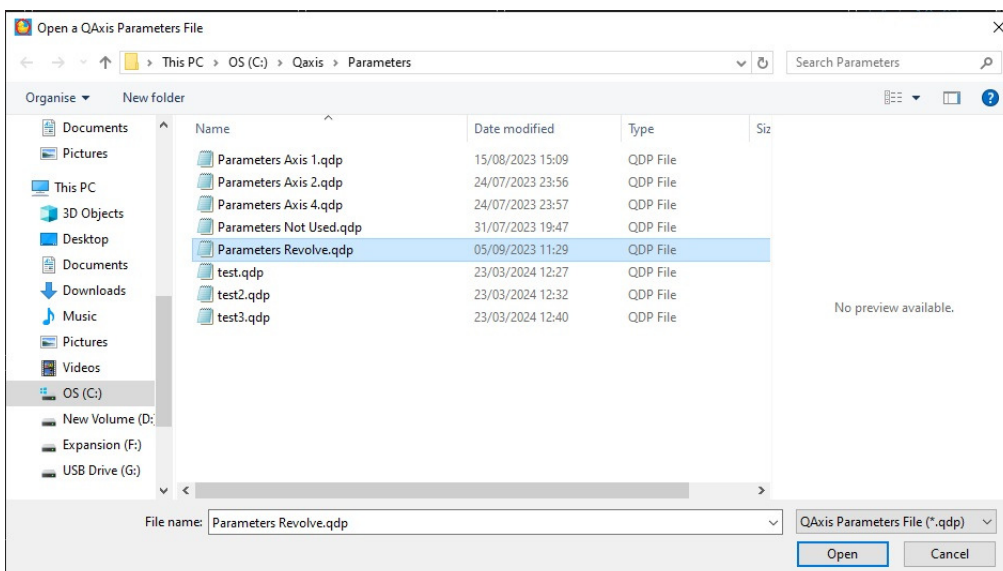
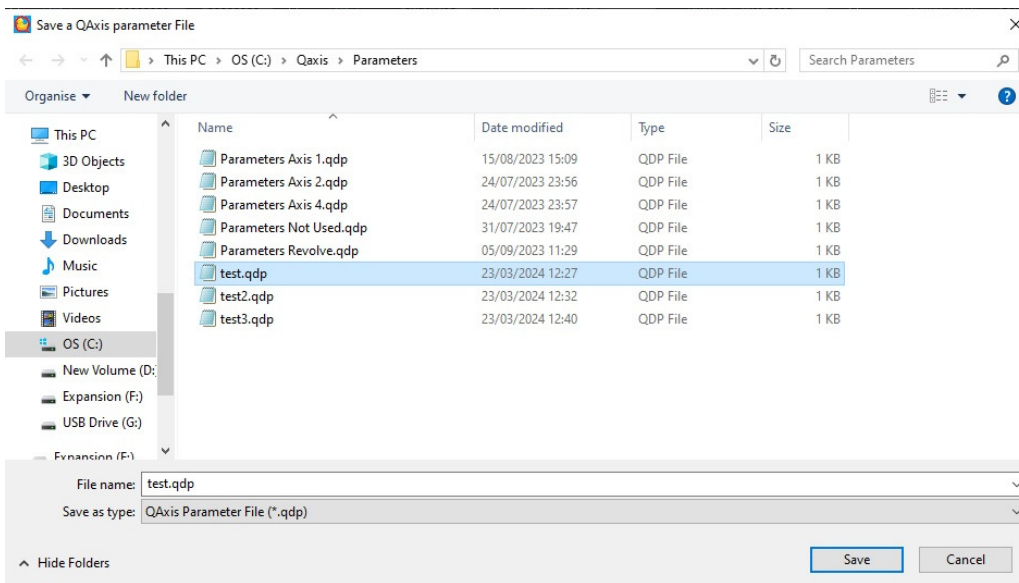
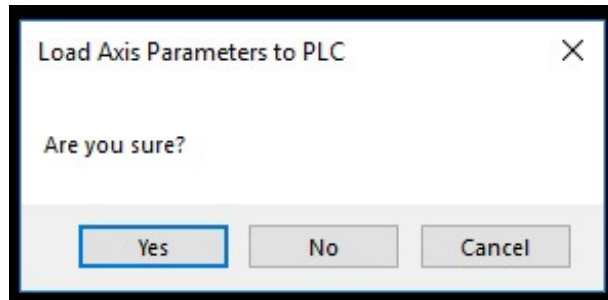
- Setting Up Enable:** A checkbox is checked. The "Name of Installation" is set to "Test Box".
- Axis Parameters:** Shows "Axis No 1" set to "Truck". A warning message reads "Caution: Adjust axis parameters with care." Below this are buttons for "Encoder Scaling Calculator" and "Transfer Soft Limits To File". There are input fields for "Scaling Multiplier", "Scaling Divisor", "High Soft Limit", "Low Soft Limit", "Max Frequency", "Stop Offset", "Creep Speed", "EStop Decel", and "Encoder Reset Value", all currently set to "Undefined". At the bottom are buttons for "Send to PLC", "Load from PLC", "Save Parameter File", "Read Parameter File", "Save As QDP File", and "Reset Parameters".
- PLC Communications:** Includes a "Local IP Address List" dropdown, "My IP Address" (192.168.1.251), "PLC IP Address" (192.168.1.45), and "Node Number" (0). A "Ping PLC" button is at the bottom.
- Soft Limits File:** A table with columns "High Limit" and "Low Limit". The first row is for "Truck" with values "99999999" and "-99999999". Subsequent rows are for "Not Used" with the same values.
- Speed Calculator Values:** A table with columns for axis name and speed. The first row is for "Truck" with a speed of "2000". Other rows are for "Not Used" with "Undefined" values.
- Axis Names:** A table with columns for "Axis", "Name", "Status", and "Label". The first row is for "Axis 1" with "Truck", "Status 1", and "Test". Other rows are for "Axis 2" through "Axis 24", all with "Not Used" names and "Not Used" labels. A "No. of Axis" dropdown is set to "1".
- Custom Buttons Setup:** A table with columns for "Button Title Text" and "Custom Buttons". It lists "Button 1 Text" through "Button 6 Text" with corresponding "Button 1" through "Button 6" labels. Below this are "Indicator 1 On Colour" through "Indicator 6 On Colour" dropdowns, all set to "Red". There is also a "Password" field set to "5555".
- QAxis Software Licence Expiry Date:** Shows the current date as "01 January 2100". It includes a "Licence Password" field with the instruction "Enter pass code here." and a "Set Expiry Date" button. Below this, it shows "Today's Date in PLC" as "1 January 3000" and "Days remaining of licence" as "10000".

## Functions

- **Send to PLC** → Sends displayed parameters to selected axis
- **Load from PLC** → Retrieves parameters from PLC
- **Save to File (.QDP)** → Stores parameters locally
- **Load from File** → Loads saved parameters into system

## Default File Location

C:\QAxis\Parameters



## Communications

The Communications window displays:

- Available IP addresses
- The currently selected IP address

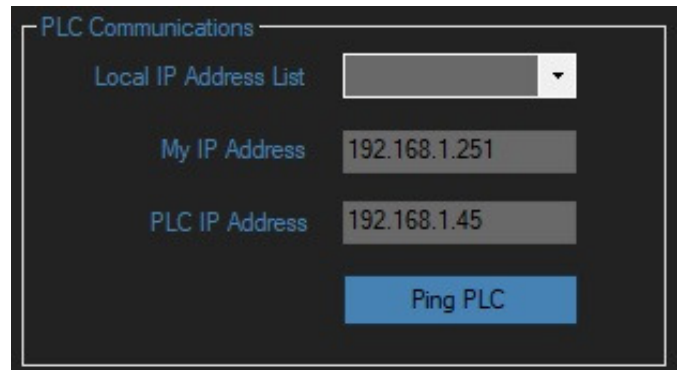
The IP address is normally loaded automatically at startup from the **qaxissettings.dat** file located in the QAxis folder.

In most cases, this setting **does not need to be changed**.

Ping PLC

A **Ping PLC** button is provided to test communication between the PC and the PLC.

- Confirms whether the PLC is reachable over the network



## Show Log

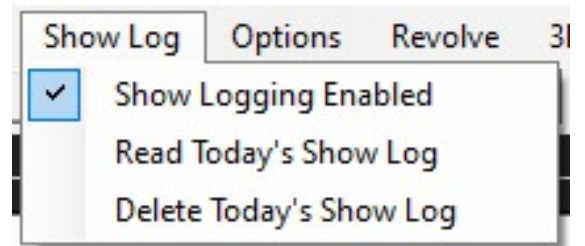
QAxis includes a **Daily Show Log** for tracking system activity.

The log records:

- All **Go** and **Stop** commands
- All **system errors** (e.g. Ultimate Limit)
- All **exception codes** (system faults)

Log Features

- All entries are **date and time stamped**
- Fault entries include:
  - Affected cue
  - Running time (if the Running Clock is active)



Troubleshooting Use

If a fault occurs:

- Export and send the show log to AVW
- Include any additional relevant information

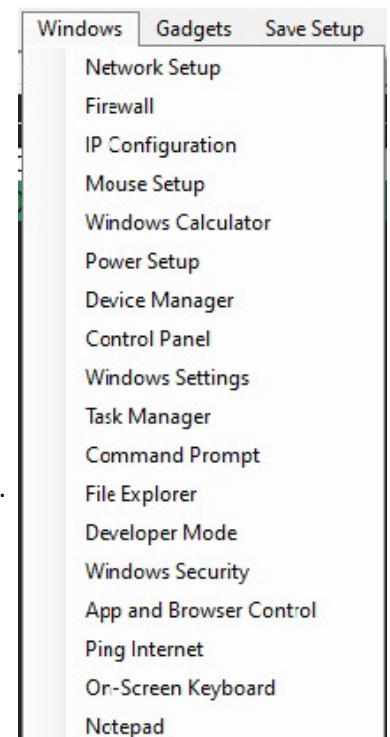
This greatly assists with remote diagnostics and support

## Windows Shortcuts

Shortcut buttons are provided to access useful Windows utilities directly from QAxis.

These tools can assist with:

- System configuration
- Diagnostics
- General troubleshooting



# Reset Encoder page

The Reset Encoder page is accessed via the main tab control.

This page allows encoder values to be reset for each axis.

### Reset Options

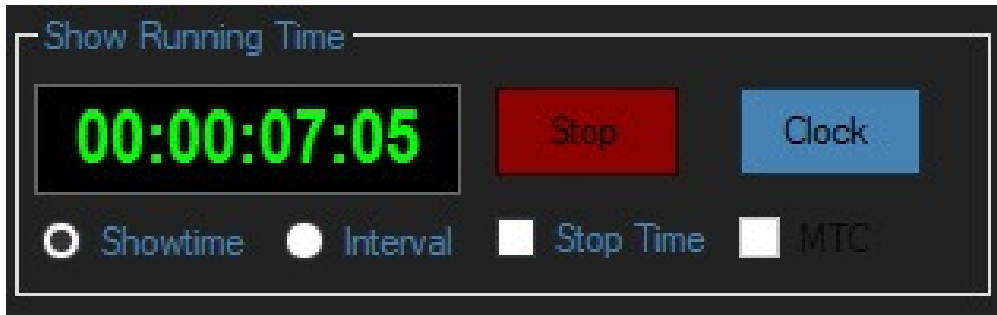
- Reset using predefined **Encoder Reset Value**
- Reset using a manually entered **Required Encoder Value**

### Additional Functions

- Save encoder reset values
- Reset all encoder values to zero

The screenshot displays two panels from the 'Reset Encoder' interface. The left panel, titled 'Reset Axis Encoder', shows a dropdown menu with 'Axis1' selected and 'Test' as the label. Below it, a slider indicates the 'Actual Encoder Position' at 3575 and the 'Required Encoder Value' at 0. A blue button at the bottom reads 'Reset Selected Encoder to required encoder value'. A red warning message states: 'Caution: This button resets the encoder value of the selected axis to the Required Encoder Value.' The right panel, titled 'Quick Reset Axis Encoders', features a grid of 24 rows, each representing an axis from Axis 1 to Axis 24. Each row contains a 'Reset Encoder' button and an 'Encoder Reset Value' field, all set to 0. A red warning message at the top reads: 'Caution: These buttons reset the encoder value to the Encoder Reset Value.' At the bottom of this panel are two buttons: 'Save Reset Values' and 'Set all to Zero'. A modal dialog box is overlaid in the center, titled 'Reset Encoder for Test to 0', with the question 'Are you sure?' and three buttons: 'Yes', 'No', and 'Cancel'.

# Running Clock



QAxis includes a **Running Clock** to track show timing.

## Functions

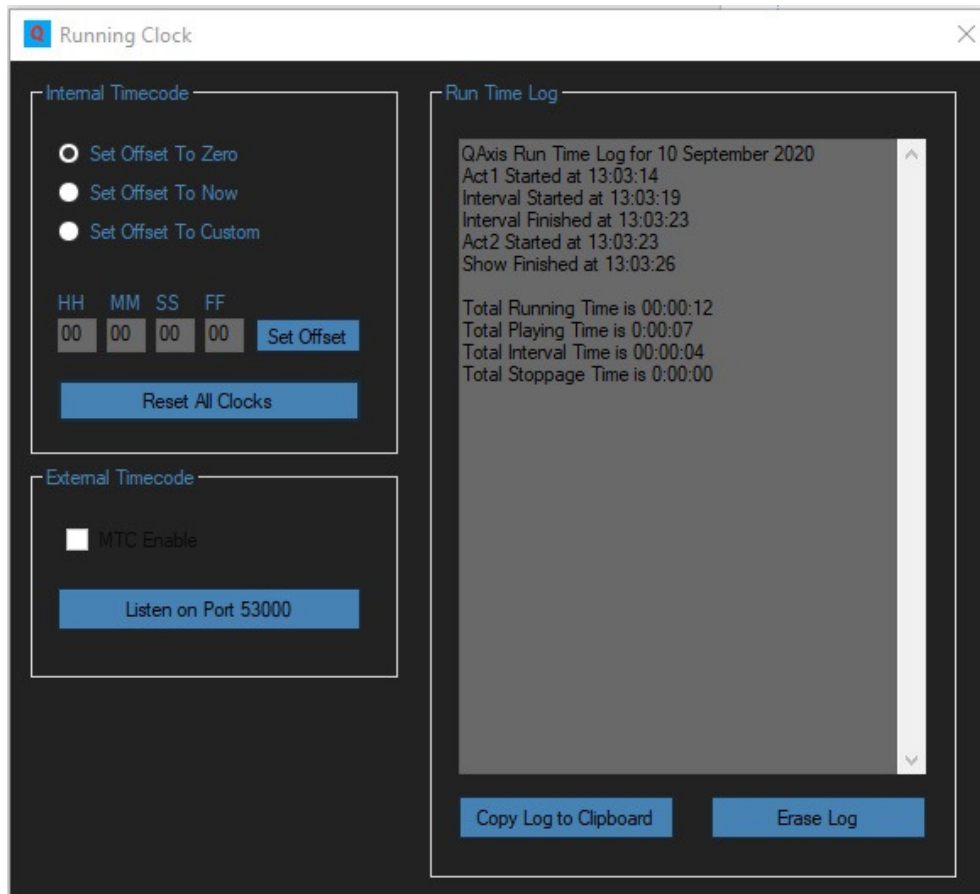
- Displays current show time
- Supports tracking of:
  - Running time
  - Interval time
  - Stoppage time

## Configuration

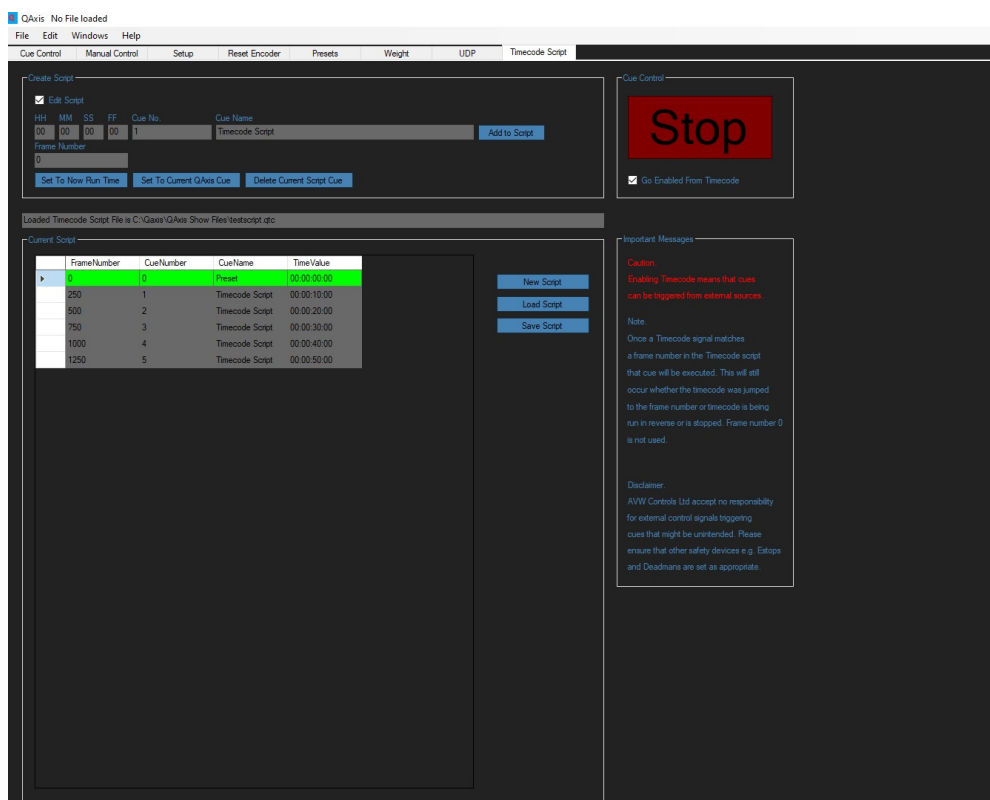
- Can be set to:
  - Current ("Now") time
  - Custom start time
  - Default start value = 0

## Integration with Show Log

- The running clock provides timestamps for the Show Log
- Useful for identifying when faults occurred



# Timecode script



QAxis can receive external MIDI Timecode via Ethernet.

- Listens on **Port 53000**
- Format: **HH:MM:SS:FF**

## Behaviour

- Running Clock displays incoming MTC
- Overrides internal clock when active

## Timecode Script

The Timecode Script allows cues to be triggered automatically based on time.

## Functionality

- Cues are triggered when the clock reaches defined time points
- Works with:
  - Internal clock
  - External MTC
- Script entries are ordered by time (frame number)
- Cue execution order can differ from cue numbering

## Important Warning

Enabling timecode allows cues to be triggered automatically or externally.

- Cues will trigger if:
  - Time jumps to a programmed frame
  - Time runs in reverse
  - Time is stopped at a trigger point

## Disclaimer

AVW Controls Ltd accepts **no responsibility** for unintended cue execution caused by external control signals.

# Reset Cue

QAxis Test Box C:\Users\info\OneDrive\Documents\AVW Controls Ltd\Projects\Old\1807 - Kinky Boots Tour\KinkyBoots7.qax

File Edit Windows Gadgets Save Setup Show Log Options Revolve Help

Cue Control Manual Control Setup Reset Encoder Deads Weight OSC/PSN/DMX Timecode Reset Cue

Reset Cue List

	Reset Cue Number	Reset Cue Name	Load Reset Cue
Last Cue	4	Off to 50	Load Reset Last Cue
Reset Cue 1	0	Preset to zero	Load Reset Cue 1
Reset Cue 2	0	Preset to zero	Load Reset Cue 2
Reset Cue 3	0.5	Show Preset - @ the 1/2	Load Reset Cue 3
Reset Cue 4	1	2 Travs past wall	Load Reset Cue 4
Reset Cue 5	4	Off to 50	Load Reset Cue 5
Reset Cue 6			Load Reset Cue 6
Reset Cue 7			Load Reset Cue 7
Reset Cue 8			Load Reset Cue 8
Reset Cue 9			Load Reset Cue 9
Reset Cue 10			Load Reset Cue 10
			Clear All Reset Cues

Reset Cue Control

Reset Cue Go  
All Stop

Reset Cue Speed Control

Default Speed/Accel/Decel  
Slow Speed/Accel/Decel  
Fast Speed/Accel/Decel

Reset Cue Info

Reset Cue Number  
**4**

Reset Cue Name  
**Off to 50**

Axis	Axis Name	Demand	Speed	Accel	Decel
Axis 1	Revolve	4125	800	30	30
Axis 2	Not Used				
Axis 3	Axis 3				
Axis 4	Axis 4				
Axis 5	Axis 5				
Axis 6	Axis 6				
Axis 7	Axis 7				
Axis 8	Axis 8				
Axis 9	Axis 9				
Axis 10	Axis 10				
Axis 11	Axis 11				
Axis 12	Axis 12				
Axis 13	Axis 13				
Axis 14	Axis 14				
Axis 15	Axis 15				
Axis 16	Axis 16				
Axis 17	Axis 17				
Axis 18	Axis 18				
Axis 19	Axis 19				
Axis 20	Axis 20				
Axis 21	Axis 21				
Axis 22	Axis 22				
Axis 23	Axis 23				
Axis 24	Axis 24				

Clear Reset Demand Positions

Clear Reset Demand Positions

The Reset Cue page stores the **start positions of the last 10 executed cues**.

## Purpose

Allows cues to be quickly reset to their original starting positions.

## Operation

1. Select a cue from the **Load Reset Cue** dropdown
2. Choose reset speed:
  - Original cue speed
  - Fast
  - Slow
3. Execute reset

## Additional Features

- Reset positions can be:
- Saved
- Loaded from file

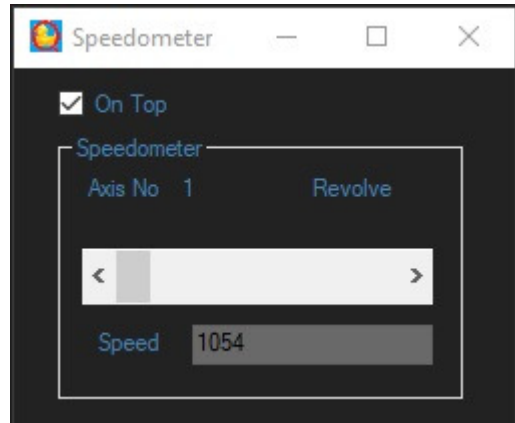
## Stopwatch



A stopwatch tool is available via the Gadgets menu.

Used for: Accurately timing individual movements

## Speedometer



A speedometer tool is also available via the Gadgets menu.

Used for: Measuring and verifying movement speed

## Custom Buttons



The Custom Buttons window is located on the main screen.

### Purpose

Provides programmable buttons for additional system functions or macros.

### Typical Uses

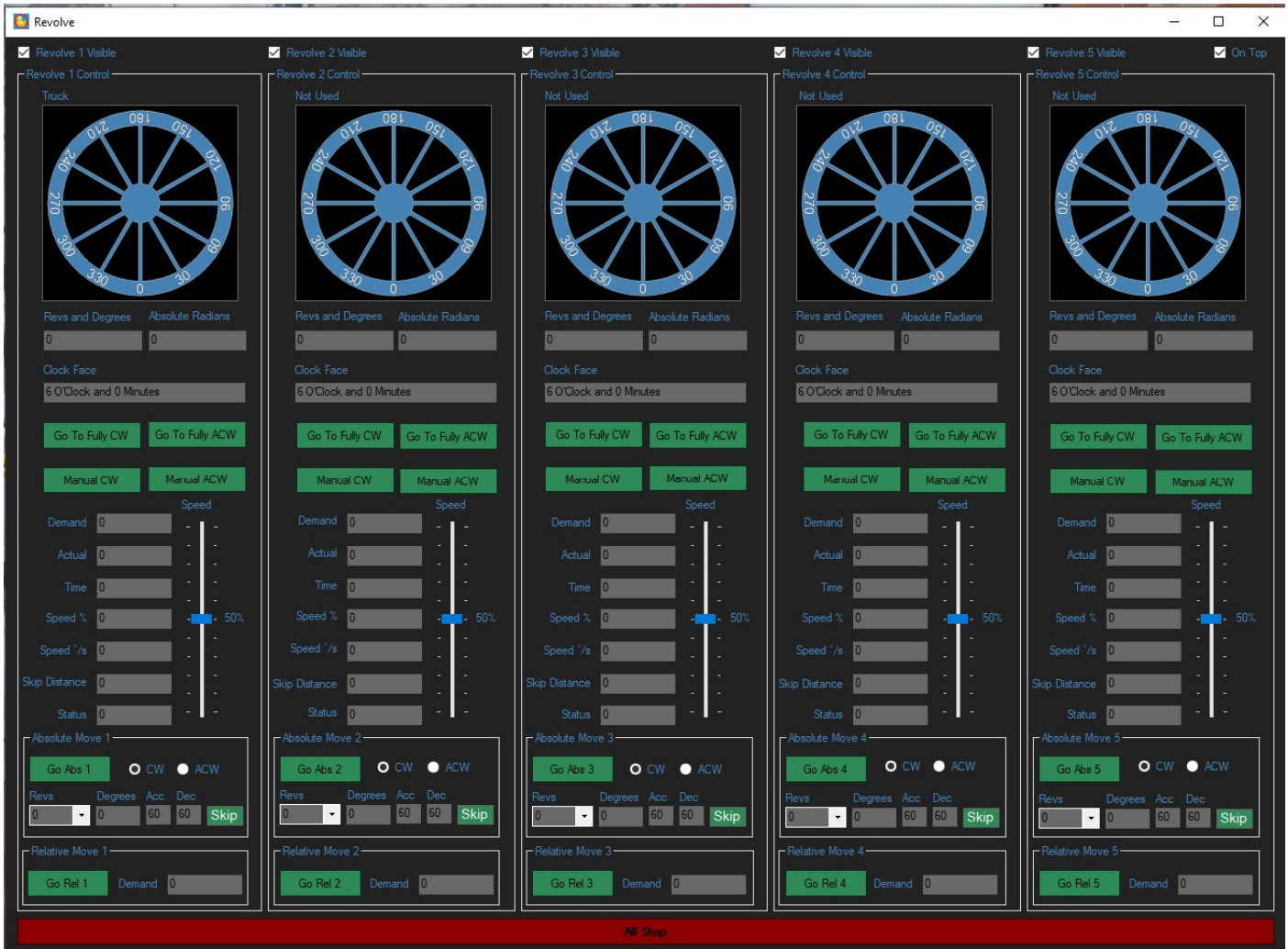
- Switching hydraulic systems on/off
- Moving axes to predefined positions
- Controlling simple I/O operations

### OSC Integration

Custom buttons 1–4 can be triggered via OSC:

- /1/push1 0.0
- /1/push2 0.0
- /1/push3 0.0
- /1/push4 0.0

# Revolve Interface



The Revolve Interface is available for **Axis 1 to 5**.

## Function

Provides visual and numerical control of rotational movements.

## Calibration

- 1 revolution = **36,000 counts**

# Messages



The Messages window logs:

- Operator actions
- System events

## Logging

- All messages are also stored in the Show Log
- Entries are time-stamped

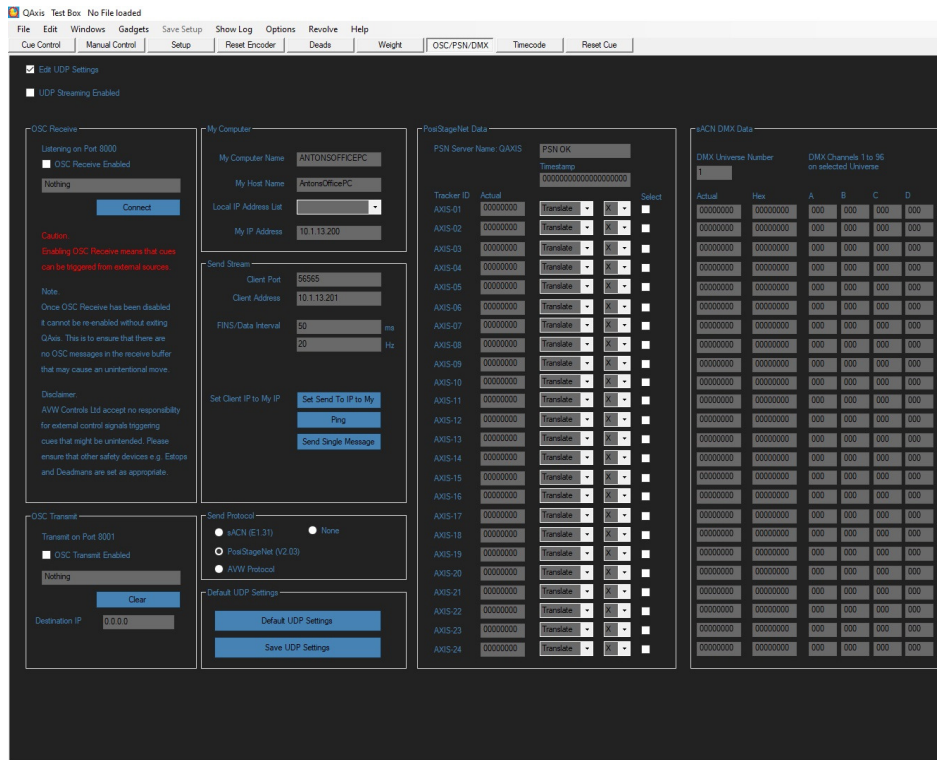
## Best Practice

- Report system exceptions to AVW

## Include:

- Show log
- Relevant context

# OSC/PSN/DMX



This page allows integration with external systems.

## SACN DMX Output

- Sends axis position data as DMX
- 4 channels per axis
- Channels 1–96
- Universe range: 1–63,999

Default settings:

- IP: 2.0.0.1
- Port: 5568

## PosiStageNet (PSN)

- Sends position data over network
- Port: **56565**
- Configurable IP

Data formats:

- X, Y, Z (metres)
- Rotation (radians)

Naming:

- Server: QAXIS
- Trackers: AXIS-01 to AXIS-24

## AVW Protocol

- Sends ASCII messages
- Port: **5656**

Format example:

STX:01:11111111:02:22222222:....:ETX

## OSC (Open Sound Control)

- Listens on Port 8000

Commands

Stop all axes:

- Stop, stop, STOP, Pause, etc.

Load and run cue:

- /qaxis/cue/go ,s "1.1111"

Trigger by name:

- /qaxis/cue/goName ,s "Cue Name"

Trigger custom buttons:

- /1/push1 ,f 1.0

Compatibility

- Works with tools such as QLab
- Compatible with LittleOSC (mobile devices)

Enabling OSC allows external systems to trigger cues.

# Weight

### Edit Weight Settings

Edit Weight Settings

Default Weight Settings

Save Weight Settings

Edit in Metric only

### Weight Information

Weighing On  KiloGrams

Audible Warning On  Pounds

	Axis Name	Low Weight	High Weight	Actual Weight
Axis 1	Revolve	0	1000	
Axis 2	Not Used	0	500	
Axis 3	Axis 3	0	500	
Axis 4	Axis 4	0	500	
Axis 5	Axis 5	0	500	
Axis 6	Axis 6	0	500	
Axis 7	Axis 7	0	500	
Axis 8	Axis 8	0	500	
Axis 9	Axis 9	0	500	
Axis 10	Axis 10	0	500	
Axis 11	Axis 11	0	500	
Axis 12	Axis 12	0	500	
Axis 13	Axis 13	0	500	
Axis 14	Axis 14	0	500	
Axis 15	Axis 15	0	500	
Axis 16	Axis 16	0	500	
Axis 17	Axis 17	0	500	
Axis 18	Axis 18	0	500	
Axis 19	Axis 19	0	500	
Axis 20	Axis 20	0	500	
Axis 21	Axis 21	0	500	
Axis 22	Axis 22	0	500	
Axis 23	Axis 23	0	500	
Axis 24	Axis 24	0	500	

A Weight page is available when weight monitoring hardware is installed.

## Functionality

- Displays measured weight

Provides warnings for:

- Overload
- Underload

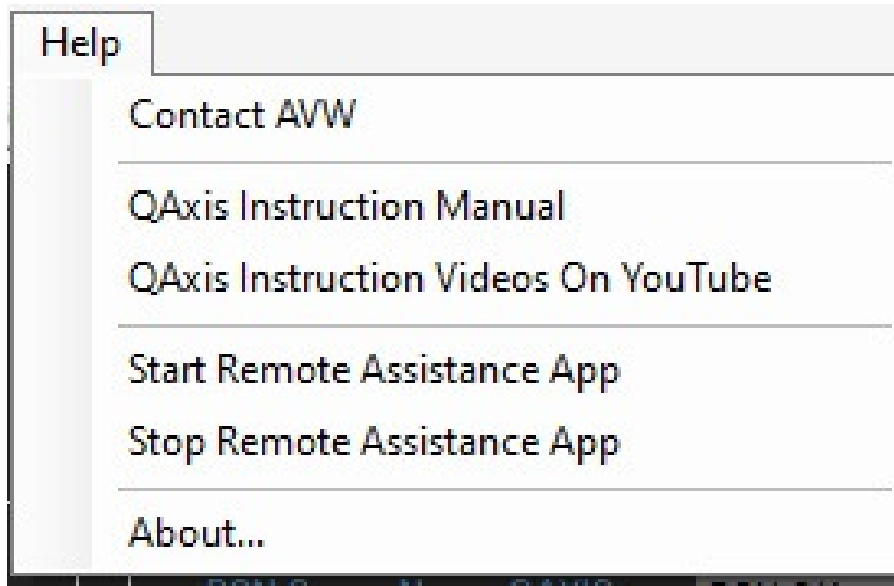
## Important Note

- Warnings do **not automatically stop movement**
- Movement control depends on PLC configuration
- Behaviour is determined by project-specific risk assessment

## Units

- Setup is in metric
- Display can be switched to pounds

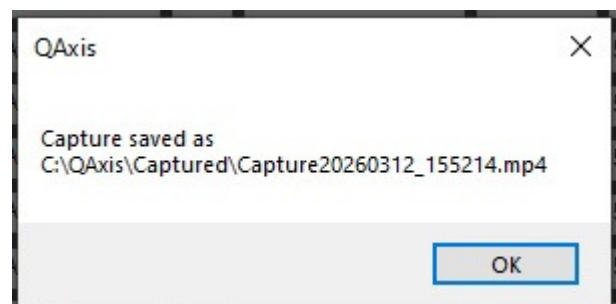
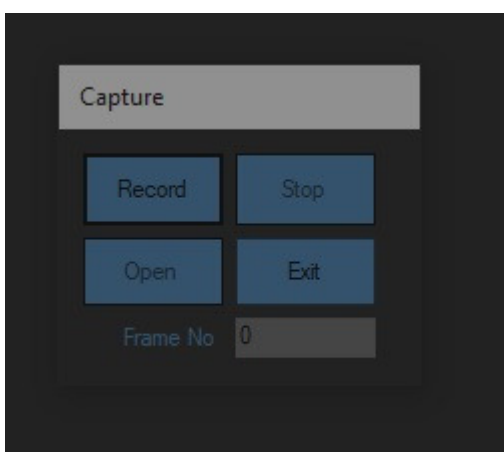
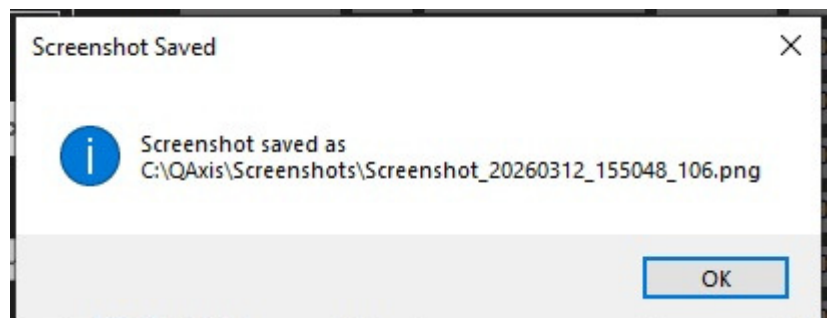
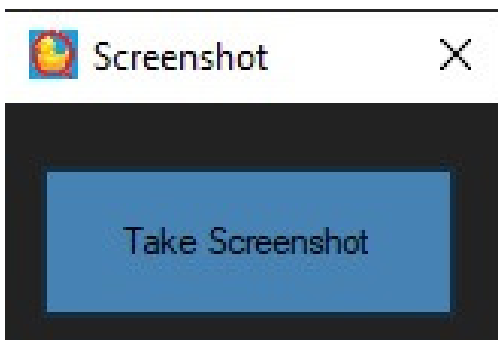
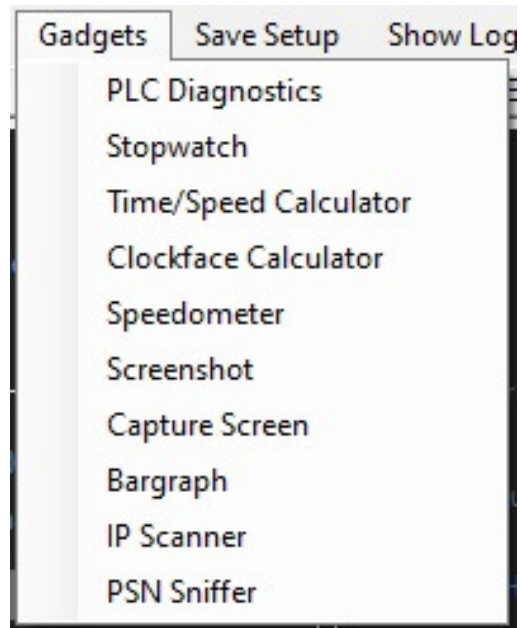
## Help!



The Help section provides:

- Link to AVW website
- Access to instruction manual
- Instructional videos (YouTube)
- Remote Assistance launcher

## Gadgets



The Gadgets menu provides tools for:

- System setup
- Diagnostics
- Testing

# PLC Diagnostics

PLC Diagnostics
— □ ×

On Top

**Read Data**

Start Address

DM Area

0 Ch

Auto Read

Clear Data

**Write Data**

0 DM Ch

0 Data

1 Word  2 Words

Write Data

**IO Force Bit**

0 IO Ch

00 Bit

Force Bit On

Force Bit Off

Clear Forces

PLC Monitor Mode

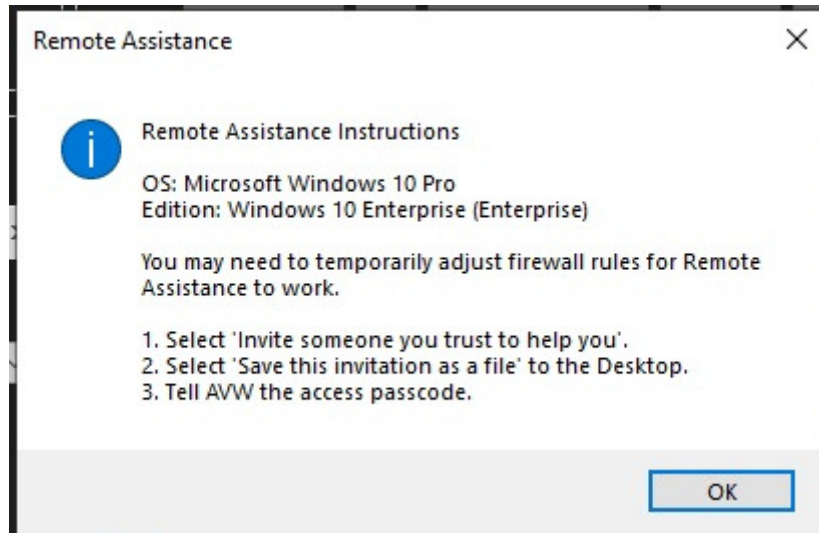
PLC Run Mode

Address	Words	DWords	Binary	HEX	Bytes
0	-1	-1	1111111111111111	FFFF	255 255
1	-1		1111111111111111	FFFF	255 255
2	500	3932660	000000111110100	01F4	1 244
3	60		000000000111100	003C	0 60
4	60	60	000000000111100	003C	0 60
5	0		000000000000000	0000	0 0
6	0	0	000000000000000	0000	0 0
7	0		000000000000000	0000	0 0
8	8157	8157	000111111011101	1FDD	31 221
9	0		000000000000000	0000	0 0
10	500	3932660	000000111110100	01F4	1 244
11	60		000000000111100	003C	0 60
12	60	60	000000000111100	003C	0 60
13	0		000000000000000	0000	0 0
14	0	0	000000000000000	0000	0 0
15	0		000000000000000	0000	0 0

Allows viewing of PLC data memory areas.

- Primarily used for fault finding
- Typically accessed by AVW during remote support

# Windows Remote Assistance



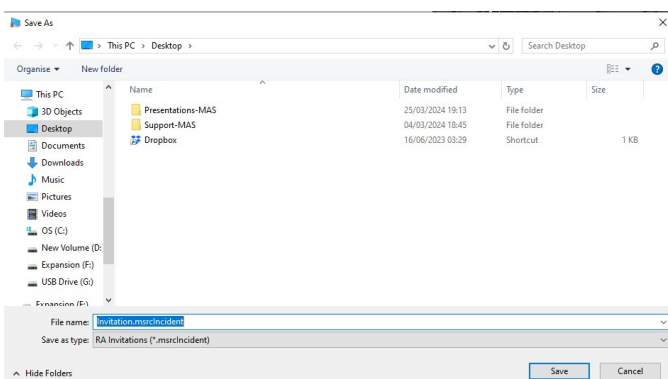
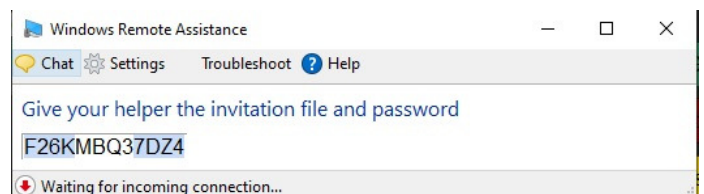
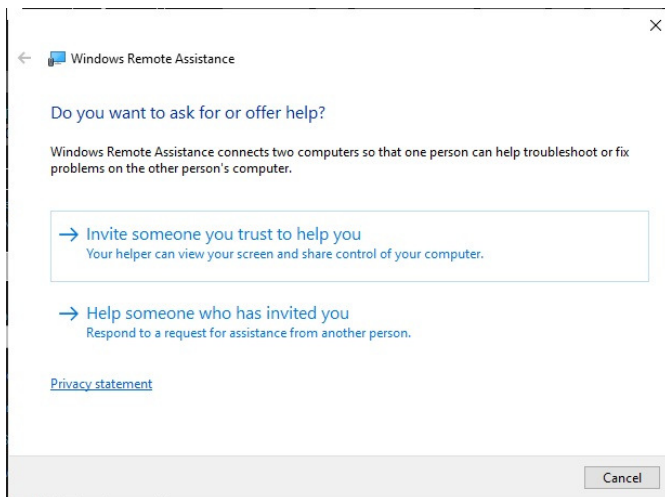
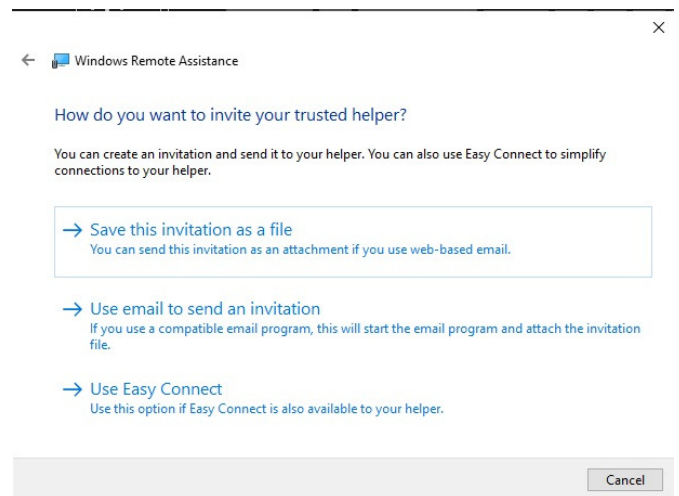
Provides access to Windows Remote Assistance.

Requirements:

- Windows Pro (not Home edition)

Used for:

- Remote support
- Troubleshooting



# PSN Sniffer

The screenshot shows the PSN Sniffer application window. At the top, there's a title bar with the application name and a close button. Below that, the interface is divided into several sections:

- Configuration Section:** Contains fields for 'PSN Port' (56565), 'Sniffing' status, 'Rate' (15.15 Hz), 'Frame' (250), and 'Last INFO' (15:56:19). There are also buttons for 'Start Sniffing', 'Stop Sniffing', and 'Clear'. Additional fields show 'Sender' (192.168.250.100), 'System' (QAXIS), 'Δt' (66.00 ms), 'Drift' (1.00 ms), 'Valid' (OK (1)), 'Drops' (2), 'Ver' (2.0), and 'Trackers' (1). There are also buttons for 'Save Log CSV' and 'Save Log Txt'.
- Log Table:** A table with columns for timestamp, IP address, type, and details. The highlighted row is:
 

2026-03-12 15:56:19.030	192.168.250.100:51691	DATA	AXIS-01 (id=1) Pos=(3.575,0,0) Valid=1 (pos only)
-------------------------	-----------------------	------	---
- Packet Details Section:** Shows a detailed view of the selected packet:
 

```
2026-03-12 15:56:19.030 192.168.250.100
DATA AXIS-01 (id=1) Pos=(3.575,0,0) Valid=1 (pos only)

PSN_DATA (0x6755)
Header: ts=13279000µs ver=2.0 frame=232 packetsInFrame=1

Trackers:
AXIS-01 (id=1) Pos=(3.575,0,0) Valid=1 (pos only)
```

Tool for debugging PosiStageNet systems.

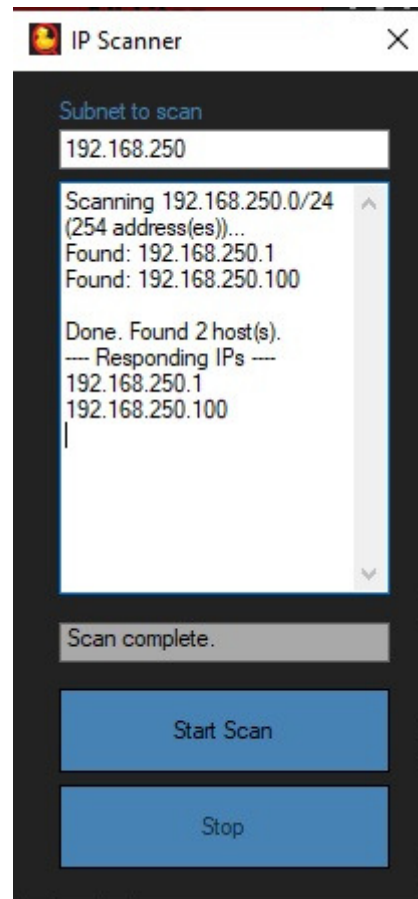
- Displays incoming PSN messages
- Identifies message validity
- Typically used by AVW support engineers.

## IP Scanner

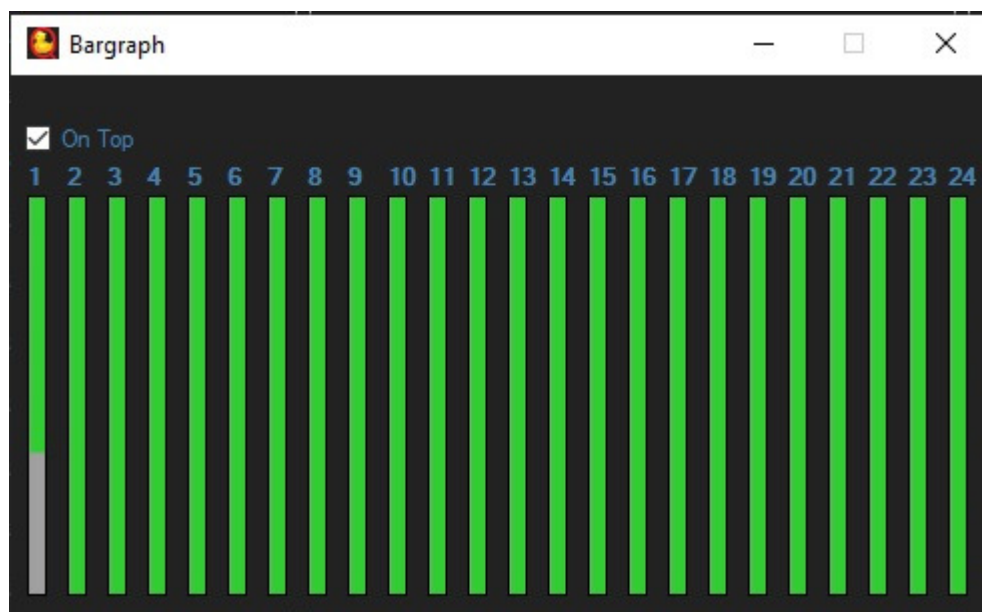
Scans network devices to identify IP addresses.

Useful when:

- PLC IP address is unknown or changed



## Bargraph Display



Displays relative axis positions visually.

Useful for:

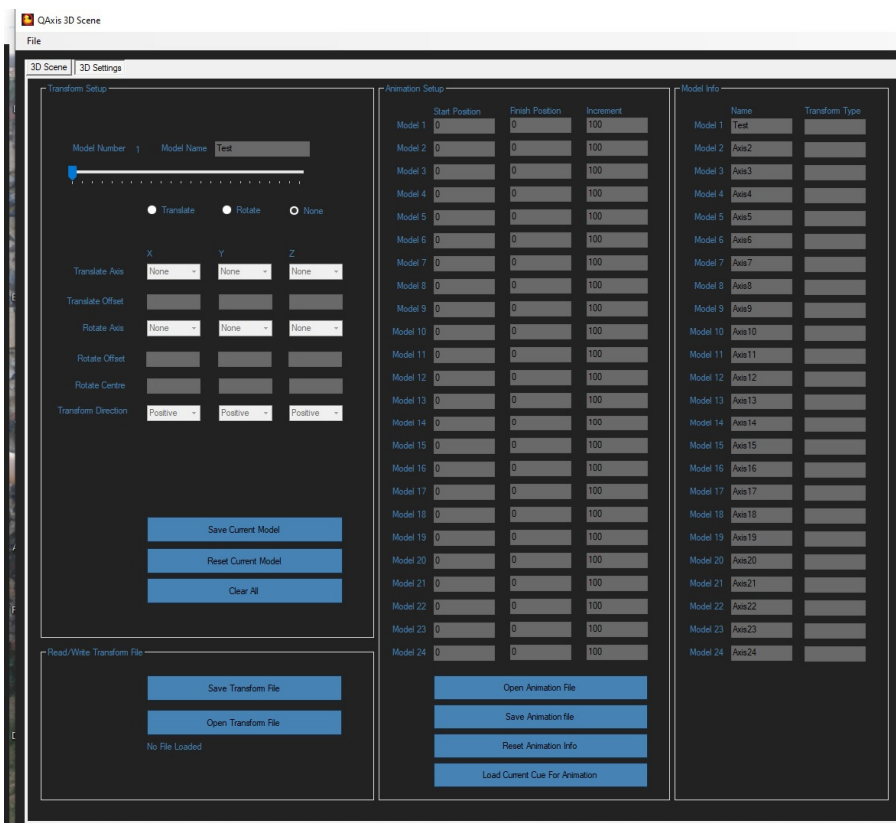
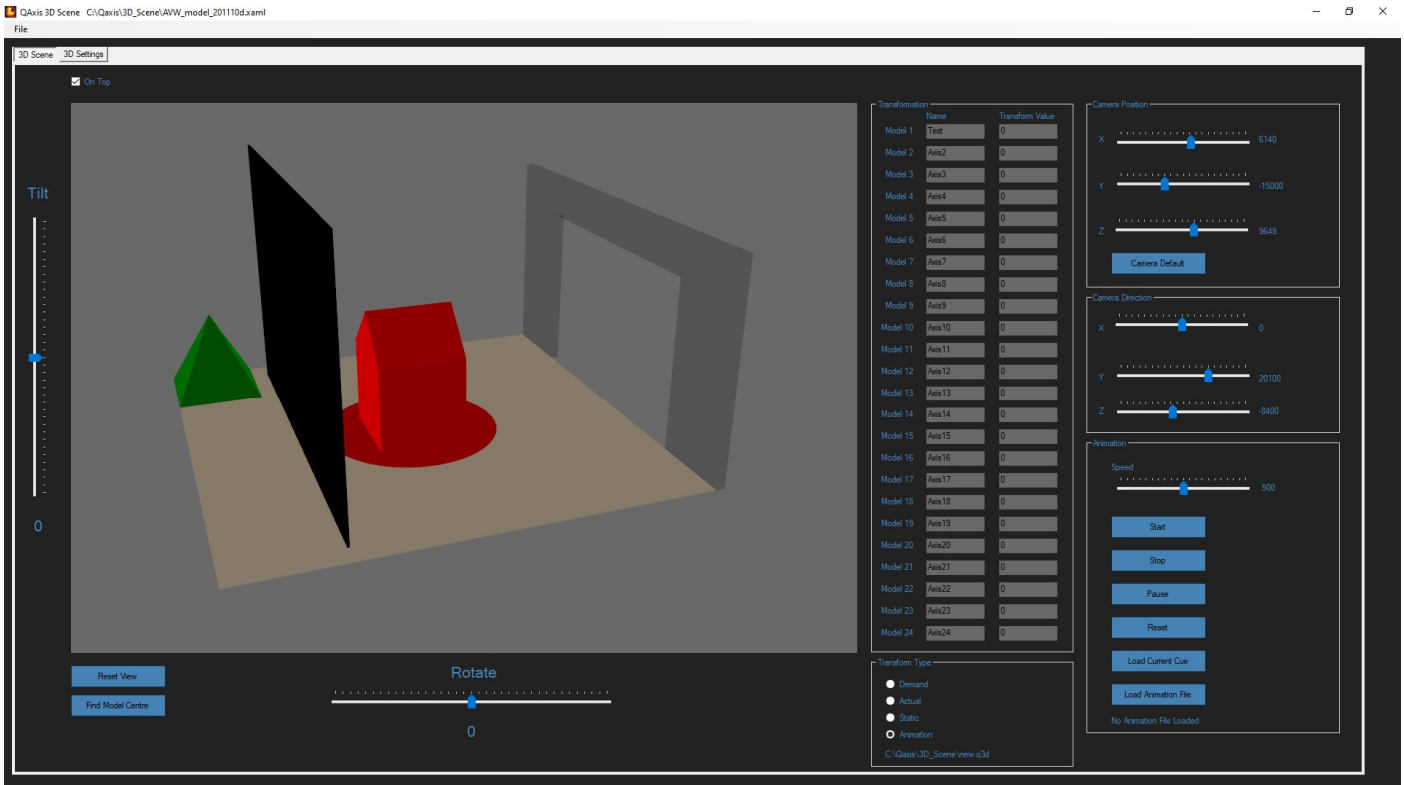
- Comparing hoist heights
- Visual diagnostics

# 3D Scene

Provides a 3D visualisation of the stage setup.

Display:

- Demand positions
- Actual positions
- Static positions
- Animate cues



## Note

- Setup of 3D models is complex
- Typically performed by AVW
- Training provided per project

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