Prayer Time Scheduler

USER MANUAL

Forward Thinking Designs

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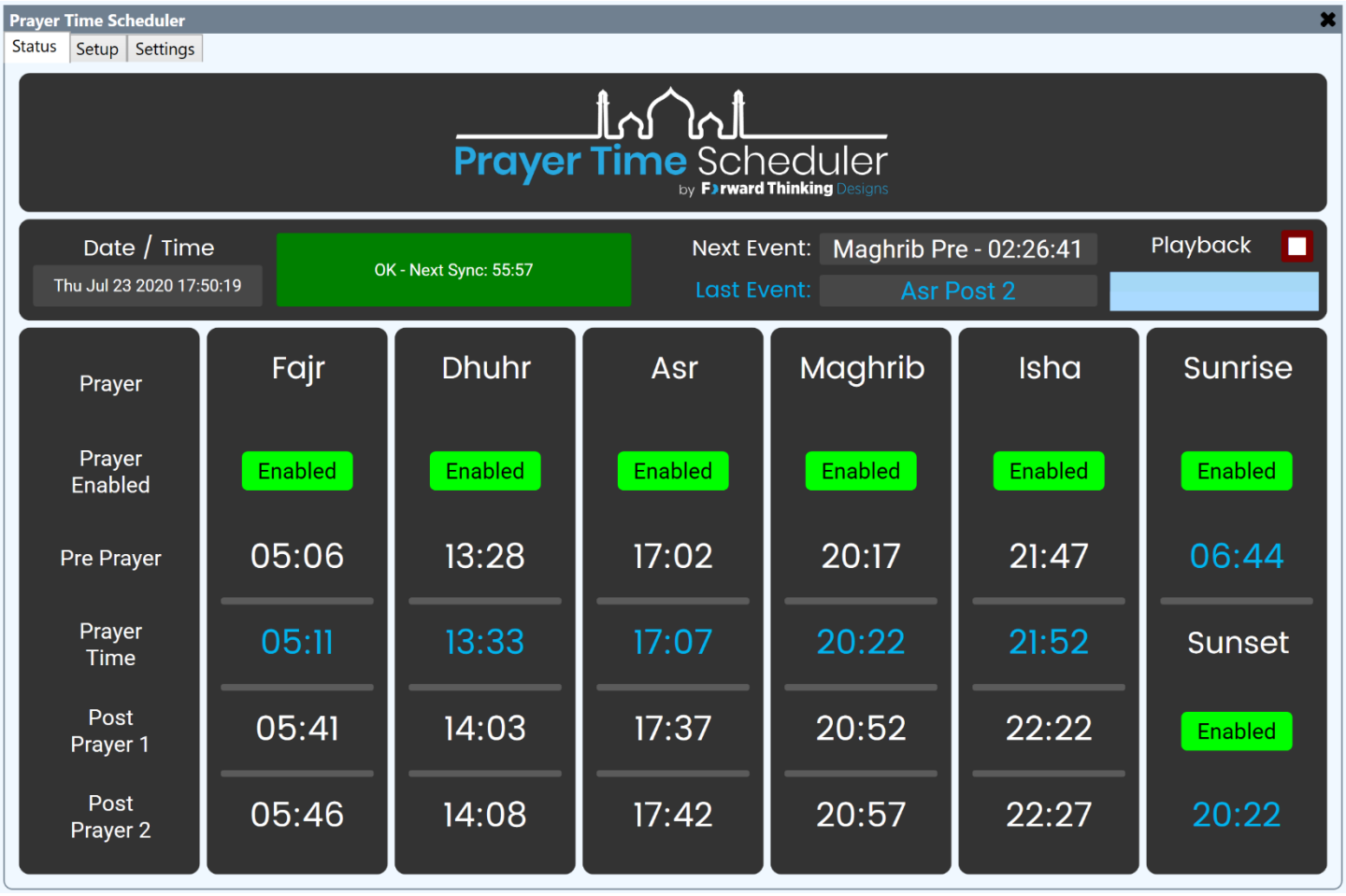
OVERVIEW

The **Prayer Time Scheduler** plugin by Forward Thinking Designs is a scheduling and playback plugin for Islamic calls-to-prayer for QSC® Q-SYS™. Prayer Time Scheduler is designed to unobtrusively fade out audio, play the call to prayer punctually, and fade audio back in.

This plugin features a variety of calculation methods, multiple clock sources, and audio playback for both start and end of prayers. Suitable for any locations needing to play Islamic calls-to-prayer, Prayer Time Scheduler by Forward Thinking Designs will simplify your audio projects.

Prayer Time Scheduler requires a license key to function but can be used in demo mode for 10 minutes to evaluate the plugin. The 10-minute period can be restarted by restarting the Q-SYS™ design. Use of the plugin in demo mode for commercial purposes is prohibited.

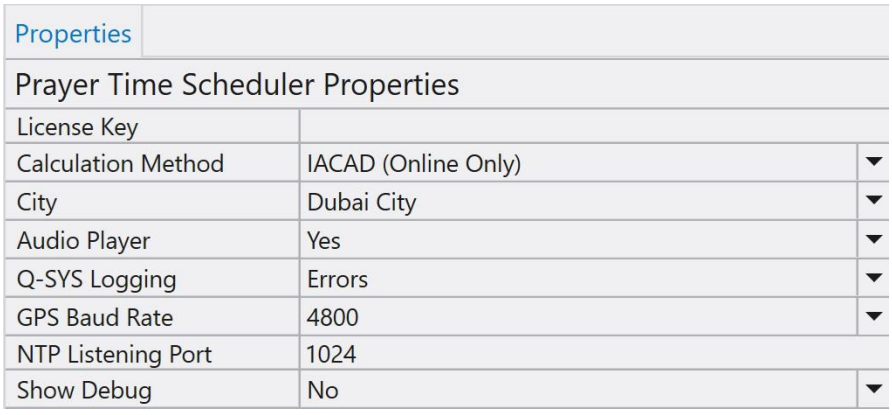
Prayer Time Scheduler downloads and license keys can be obtained from Forward Thinking Designs at ForwardThinkingDesigns.com or from GSL Professional at gslprofessional.com.



CONFIGURATION

Properties

Property	Function	Choices
License Key	Enter the license key here to activate the plugin.	
Calculation Method	Determine the method used to calculate prayer times. Additional information available in Appendix B.	Egyptian General Authority of Survey Islamic Society of North America Majlis Ugama Islam Singapura Muslim World League Umm al-Qura University, Makkah Union des Organisations Islamiques de France University Of Islamic Sciences, Karachi, Department of Islamic Affairs and Charitable Activities (IACAD)
Audio Player	Choose whether to use the built-in Audio Player.	Yes No
Q-SYS Logging	Determine logging detail level.	Off Errors Verbose
GPS Baud Rate	Set the RS-232 Baud Rate of the GPS receiver.	4800 9600 14400 19200 38400 57600 115200 128000
NTP Listening Port	Set listening port number of the NTP client.	0 - 65535



Clock Source

For the Prayer Time Scheduler plugin to accurately calculate and trigger prayer times, it is mandatory that the plugin has an accurate, synchronized clock source. The recommended clock sources are:

NTP Server: The Prayer Time Scheduler plugin has an internal NTP client that can connect to any NTP server over the network. Public internet NTP servers are recommended and require little setup if your Q-SYS™ Core has a connection to the internet. It is possible to use NTP servers on the local network, but it is important that the NTP server used is trusted and accurate.

GPS Receiver: If your Q-SYS™ Core cannot be connected to the internet and you do not have an NTP server on the local network, a RS-232 GPS receiver is recommended. A GPS receiver uses the GPS satellite system to receive the current time but requires a clear view of the sky. The GPS receiver can be connected to the RS-232 port on the Q-SYS™ Core or any peripheral with a RS-232 port. The recommended GPS receiver is the Garmin 18x LVC which is commonly available and affordable.

It is possible to select the internal core clock as the clock source, this is only intended for testing and evaluation of the plugin, the internal core clock accuracy cannot be confirmed by the plugin and will drift over time. The core clock should not be used for regular operation.

Setup

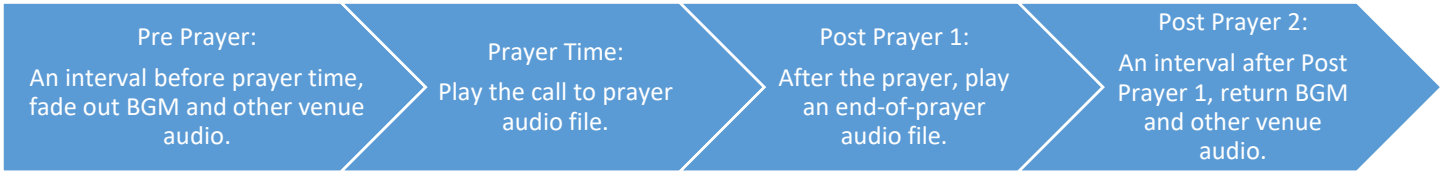
To configure Prayer Time Scheduler, follow these steps:

1. Enter your License Key provided to you in the Properties window. Without a license the plugin will only function for 10 minutes.
2. Choose the appropriate calculation method for your requirements/region. The default method is "Umm al-Qura University, Makkah".
3. Choose whether to use the built-in Q-SYS audio player by setting the "Audio Player" property to "Yes" or "No".
4. Select the desired value for "Logging Mode".
    a. When set to "Off" Prayer Time Scheduler does not send any log messages to the Q-SYS log.
    b. When set to "Errors" only plugin errors such as clock synchronization errors are sent to the Q-SYS log. (This is the recommended level for normal operation.)
    c. When set to "Verbose" all events are sent to the Q-SYS log, including clock synchronization, event triggers and all errors.
5. If using a GPS receiver as the clock source, wire the GPS receiver RS-232 to a Q-SYS peripheral and digitally wire the RS-232 component to the serial pin on the plugin.
    a. Set the GPS Baud Rate property to the same baud rate as the GPS receiver. If using the Garmin 18x LVC the default baud rate is 4800, if using the Garmin 18x 5Hz the default baud rate is 19200.
6. The offline plugin settings are now finished, and the plugin should be run on an active Q-SYS™ Core using *Save to Core & Run*.
7. Set the Q-SYS Core Date, Time and Time Zone in the Core Manager web interface. It can be accessed at http://core ip address/date-time. This is mandatory for proper operation of the plugin.
    a. If using an NTP server, enable Time Synchronization and enter the desired NTP server addresses. If using server domain names (i.e. 0.pool.ntp.org) DNS will need to be enabled and configured in the networking settings of the core.
8. On the settings page of the Prayer Time Scheduler plugin, select the Clock Source from the dropdown menu. Core Clock should only be used for testing and evaluation and should not be used for regular operation.
9. Set the Longitude and Latitude. Prayer Time Scheduler calculates the angles of the sun and prayer times for the location entered. Enter the longitude and latitude of the desired location in decimal degrees. If the prayer times should match those calculated by an organization, the longitude and latitude must match those used by the organization to calculate prayer times.

10. Set the Time Zone to the standard time zone for the location of the core. If the core is in a region which observes Daylight Sayings Time, the Time Zone control should be set to the Standard Time offset when Daylight Savings Time is not in effect.
11. Verify that the Status of the Prayer Time Player plugin is “OK” and that the Date/Time control indicates the correct local time.
12. Configure the desired Pre Prayer, Post Prayer 1 and Post Prayer 2 times on the Setup page.
13. Connect the desired Pre Trigger, Prayer Trigger, Post 1 Trigger and Post 2 Trigger control pins to the desired functions in the Q-SYS design.
14. Congratulations, Prayer Time Scheduler is now ready to use!

Typical Use Case

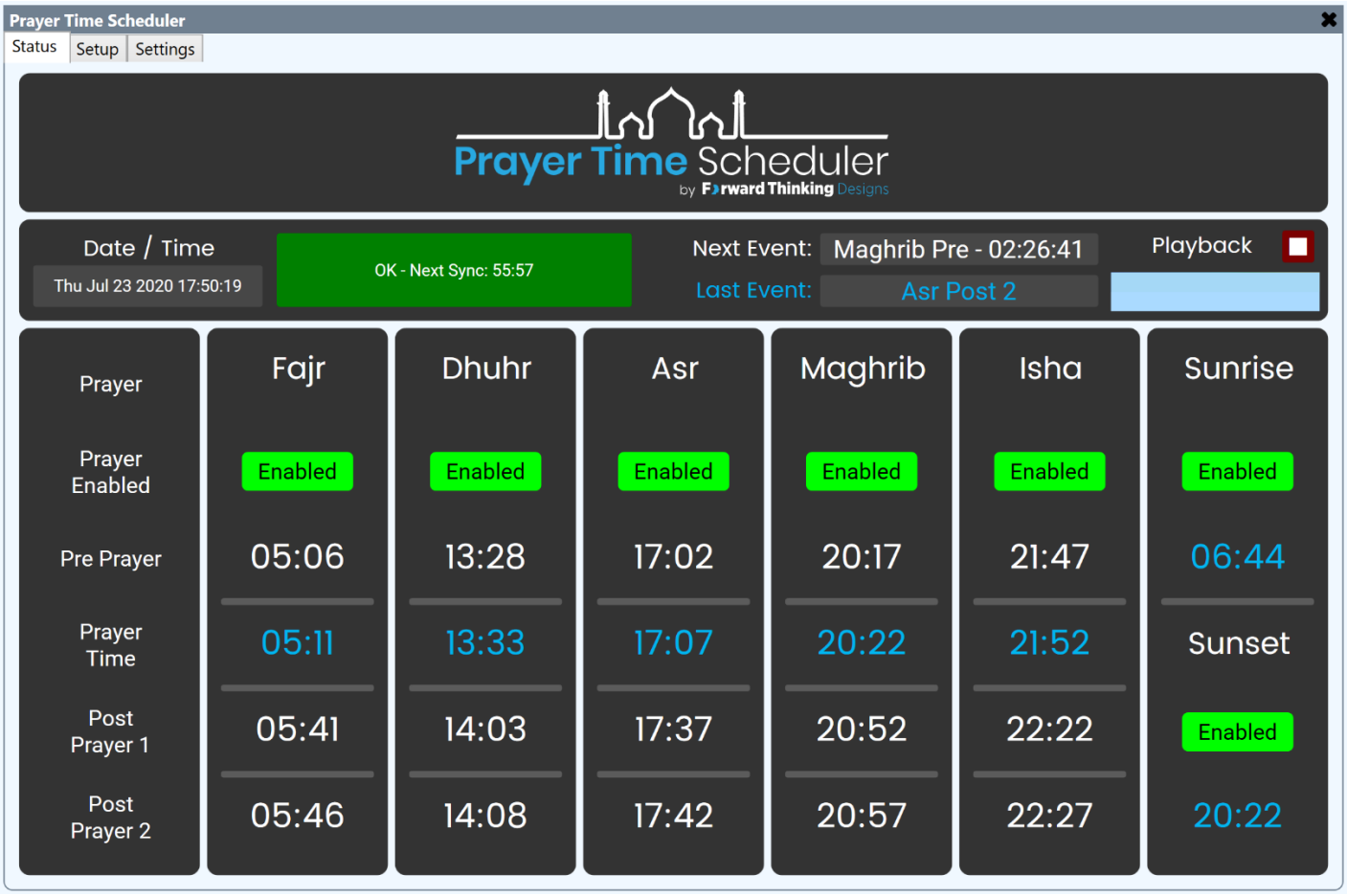
The sequence of events for a call to prayer is typically as follows:



All events are optional, and the intervals can be configured individually for each prayer.

CONTROLS

Status



Status

Status – Displays the clock synchronization status and time to next sync.

Date/Time – Displays the current date, in Gregorian calendar format, and the current time of the local time zone.

Next Event – Displays the name of the next event scheduled, and a countdown to its schedule time.

Last Event – Displays the last event that occurred.

Playback Filename – Displays the filename of the currently playing or last played audio file and a meter of the audio output.

Playback Progress – Displays the progress bar and the time remaining of the currently playing audio file.

Playback Stop – Immediately stops any currently playing audio file.

Prayer Status – Fajr, Dhuhr, Asr, Maghrib, Isha

Prayer – The name of the prayer, in order of occurrence throughout the day.

Prayer Enabled – Indicates whether the respective Prayer and all associated events are enabled or disabled.

Pre Prayer – The calculated time for pre-prayer events to trigger.

Prayer Time – The calculated time for the call to prayer to trigger.

Post Prayer 1 – The calculated time for the first post-prayer events to trigger.

Post Prayer 2 – The calculated time for the second post-prayer events to trigger.

Sunrise

Enabled – Indicates whether Sunrise events are enabled or disabled.

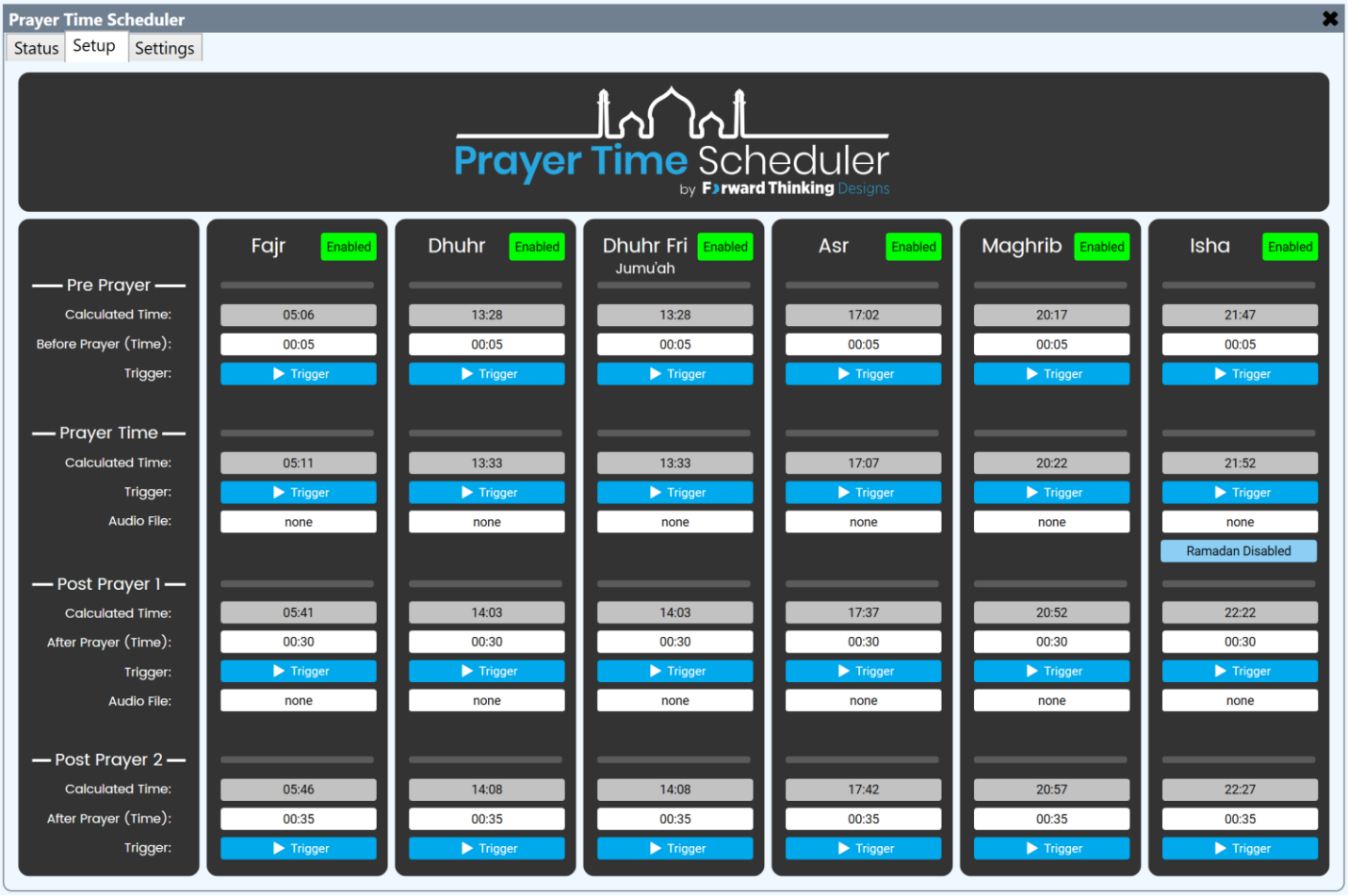
Sunrise Time – The calculated time of sunrise.

Sunset

Enabled – Indicates whether Sunset events are enabled or disabled. Sunset events are separate from Maghrib events.

Sunset Time – The calculated time of sunset.

Setup



Prayer Setup – Fajr, Dhuhr, Dhuhr Fri, Asr, Maghrib, Isha

Enabled – Toggles on and off all events associated with that prayer.

Pre Prayer

Calculated Time – The time at which the Pre Prayer event will trigger. Determined automatically from Before Prayer (Time).

Before Prayer (Time) – How long before the prayer time that the Pre Prayer event will trigger.

Trigger – Manually trigger the Pre Prayer event.

Prayer Time

Calculated Time – The time at which the Prayer event will trigger. Calculated automatically by the plugin.

Trigger – Manually trigger the Prayer event.

Audio File – The audio file to play at the prayer time.

Ramadan – Adjusts the Isha prayer calculation for Ramadan. Only displayed when *Umm al-Qura University, Makkah* is selected as the calculation method in Properties. This control should be manually set to Enabled at the beginning of Ramadan and set to Disabled at the end of Ramadan.

Post Prayer 1

Calculated Time – The time at which the Post Prayer 1 event will trigger. Determined automatically from After Prayer (Time).

After Prayer (Time) – How long after the prayer time that the Post Prayer 1 event will trigger.

Trigger – Manually trigger the Post Prayer 1 event.

Audio File – The audio file to play at the Post Prayer 1 calculated time.

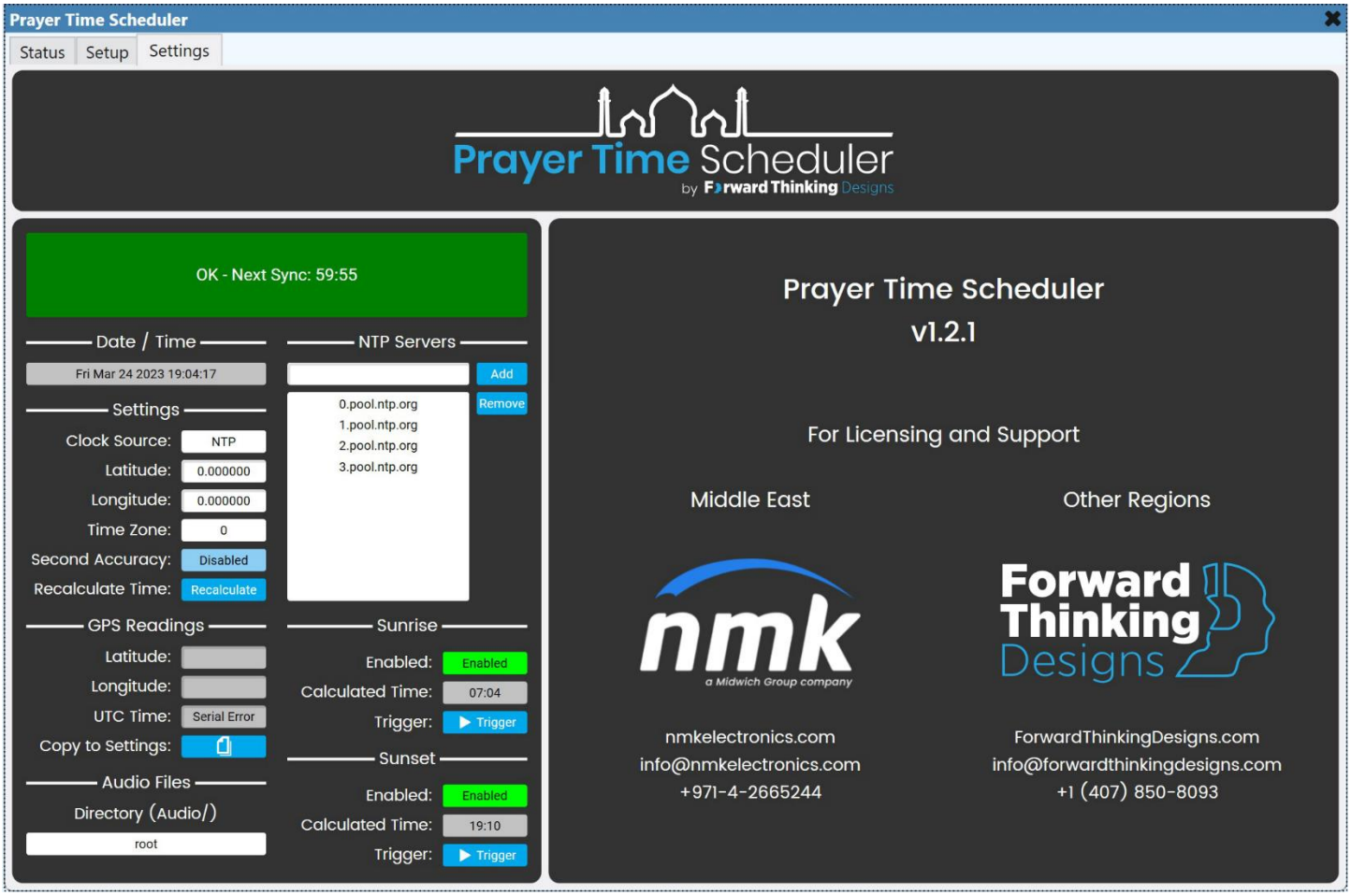
Post Prayer 2

Calculated Time – The time at which the Post Prayer 2 event will trigger. Determined automatically from After Prayer (Time).

After Prayer (Time) – How long after the prayer time that the Post Prayer 2 event will trigger.

Trigger – Manually trigger the Post Prayer 2 event.

Settings



Status – Displays the clock synchronization status and time to next sync.

Date/Time – Displays the current date, in Gregorian calendar format, and the current time of the local time zone.

Settings

Clock Source – Select the clock synchronization source. For more information see the Clock Source section on page 6.

NTP – NTP is the recommended method if the core has internet access or an internal NTP server.

GPS –GPS is recommended when NTP is not available, it requires an RS-232 GPS receiver with a clear view of the sky.

Core Clock – Core Clock is only for testing and evaluation. The Core Clock will drift over time and should not be used for regular operation.

Latitude – The latitude of the venue, used to calculate the prayer times for the specified location.

Longitude – The longitude of the venue, used to calculate the prayer times for the specified location.

> *The format for latitude and longitude must be in decimal degrees (e.g., 40.446, 79.982). Other formats such as decimal minutes (40° 26.767', 79° 58.933') or sexagesimal degree (40° 26' 46", 79° 58' 56") must be converted to decimal degrees before entering.*

Time Zone – The time zone offset from GMT (Greenwich Mean Time) of the venue. Time Zone must be set correctly to play calls-to-prayer at their proper times. If your region observes Daylight Savings Time, the Time Zone control should be the Standard Time offset for your region and you must set the region in the Core Manager date and time settings.

Second Accuracy – Enable to calculate prayer times and events to second accuracy. When enabled all time controls in the plugin change to the HH:MM:SS format. When Disabled, prayer times and events are rounded to the nearest whole minute.

Recalculate Time – Manually recalculate every time event. Prayer times are automatically calculated at plugin startup and at midnight.

NTP Servers

NTP Server Input – Enter a new NTP server address before pressing add. Entries may be an IPv4 address or domain name. If domain names are used, the must be enabled and configured in the Core Manager Network Settings.

Add – Adds the contents of the NTP Server Input control to the NTP Servers List.

NTP Server List – All NTP servers that are queried by the plugin for synchronization.

Remove – Remove the currently selected entry from the NTP Server List.

GPS Readings

Latitude – If a GPS source is connected, the Latitude of the GPS receiver will be displayed.

Longitude – If a GPS source is connected, the Longitude of the GPS receiver will be displayed.

UTC Time – If a GPS sources is connected, the UTC Time from the GPS receiver will be displayed.

Copy to Settings – Copy the current Latitude and Longitude GPS readings to the Latitude and Longitude controls in the Settings section.

Audio Files

Directory (Audio/) – The directory in which the audio files for the internal audio player are located.

Sunrise

Enabled – Toggles on and off Sunrise events.

Calculated Time – Displays the calculated sunrise time for the current day.

Trigger – Manually trigger the Sunrise events.

Sunset

Enabled – Toggles on and off Sunset events.

Calculated Time – Displays the calculated sunset time for the current day.

Trigger – Manually trigger events the Sunset events.

APPENDIX A: CONTROL PINS

All

Pin Name	Control Type	Value Range	Pin Direction
Trigger	Trigger		Input / Output
Post 2 Trigger	Trigger		Input / Output
Prayer Trigger	Trigger		Input / Output
Pre Trigger	Trigger		Input / Output

Asr

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Post 1 Audio	String		Input / Output
Post 1 Offset	String	HH:MM	Input / Output
Post 1 Time	String	HH:MM	Output
Post 1 Trigger	Trigger		Input / Output
Post 2 Offset	String	HH:MM	Input / Output
Post 2 Time	String	HH:MM	Output
Post 2 Trigger	Trigger		Input / Output
Prayer Audio	String		Input / Output
Prayer Time	String	HH:MM	Output
Prayer Trigger	Trigger		Input / Output
Pre Offset	String	HH:MM	Input / Output
Pre Time	String	HH:MM	Output
Pre Trigger	Trigger		Input / Output

Dhuhr

Friday

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Post 1 Audio	String		Input / Output
Post 1 Offset	String	HH:MM	Input / Output
Post 1 Time	String	HH:MM	Output
Post 1 Trigger	Trigger		Input / Output
Post 2 Offset	String	HH:MM	Input / Output
Post 2 Time	String	HH:MM	Output
Post 2 Trigger	Trigger		Input / Output
Prayer Audio	String		Input / Output
Prayer Time	String	HH:MM	Output
Prayer Trigger	Trigger		Input / Output
Pre Offset	String	HH:MM	Input / Output
Pre Time	String	HH:MM	Output
Pre Trigger	Trigger		Input / Output

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Post 1 Audio	String		Input / Output
Post 1 Offset	String	HH:MM	Input / Output
Post 1 Time	String	HH:MM	Output
Post 1 Trigger	Trigger		Input / Output
Post 2 Offset	String	HH:MM	Input / Output
Post 2 Time	String	HH:MM	Output
Post 2 Trigger	Trigger		Input / Output
Prayer Audio	String		Input / Output
Prayer Time	String	HH:MM	Output
Prayer Trigger	Trigger		Input / Output
Pre Offset	String	HH:MM	Input / Output
Pre Time	String	HH:MM	Output
Pre Trigger	Trigger		Input / Output

Fajr

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Post 1 Audio	String		Input / Output
Post 1 Offset	String	HH:MM	Input / Output
Post 1 Time	String	HH:MM	Output
Post 1 Trigger	Trigger		Input / Output
Post 2 Offset	String	HH:MM	Input / Output
Post 2 Time	String	HH:MM	Output
Post 2 Trigger	Trigger		Input / Output
Prayer Audio	String		Input / Output
Prayer Time	String	HH:MM	Output
Prayer Trigger	Trigger		Input / Output
Pre Offset	String	HH:MM	Input / Output
Pre Time	String	HH:MM	Output
Pre Trigger	Trigger		Input / Output

GPS

Pin Name	Control Type	Value Range	Pin Direction
Latitude	String	-90 - 90	Output
Longitude	String	-180 - 180	Output
Time	String	HH:MM:SS	Output

Isha

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Post 1 Audio	String		Input / Output
Post 1 Offset	String	HH:MM	Input / Output
Post 1 Time	String	HH:MM	Output
Post 1 Trigger	Trigger		Input / Output
Post 2 Offset	String	HH:MM	Input / Output
Post 2 Time	String	HH:MM	Output
Post 2 Trigger	Trigger		Input / Output
Prayer Audio	String		Input / Output
Prayer Time	String	HH:MM	Output

Prayer Trigger	Trigger		Input / Output
Pre Offset	String	HH:MM	Input / Output
Pre Time	String	HH:MM	Output
Pre Trigger	Trigger		Input / Output
Enabled	Boolean	True / False	Input / Output

Maghrib

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Post 1 Audio	String		Input / Output
Post 1 Offset	String	HH:MM	Input / Output
Post 1 Time	String	HH:MM	Output
Post 1 Trigger	Trigger		Input / Output
Post 2 Offset	String	HH:MM	Input / Output
Post 2 Time	String	HH:MM	Output
Post 2 Trigger	Trigger		Input / Output
Prayer Audio	String		Input / Output
Prayer Time	String	HH:MM	Output
Prayer Trigger	Trigger		Input / Output
Pre Offset	String	HH:MM	Input / Output
Pre Time	String	HH:MM	Output
Pre Trigger	Trigger		Input / Output

Playback

Pin Name	Control Type	Value Range	Pin Direction
Filename	String		Output
Meter	Float	-60 - 20	Output
Progress	String		Output
Stop	Trigger		Input / Output

Setting

Pin Name	Control Type	Value Range	Pin Direction
Audio Directory	String		Input / Output
Clock Source	String	NTP / GPS / Core Clock	Input / Output
Latitude	String	-90 - 90	Input / Output
Longitude	String	-180 - 180	Input / Output
Recalculate	Trigger		Input / Output
Second Accuracy	Boolean	True / False	Input / Output
Time Zone	Integer	-11 - 14	Input / Output

Sunrise

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Start Time	String	HH:MM	Output
Start Trigger	Trigger		Input / Output

Sunset

Pin Name	Control Type	Value Range	Pin Direction
Enabled	Boolean	True / False	Input / Output
Start Time	String	HH:MM	Output
Start Trigger	Trigger		Input / Output

General

Pin Name	Control Type	Value Range	Pin Direction
Date/Time	String	Day Mon DD YYYY HH:MM:SS	Output
Disable	Boolean	True / False	Input / Output
Last Event	String		Output
Next Event	String		
Status	Status		Output

APPENDIX B: CALCULATION METHODS

The methods used for calculations, the associated countries or regions, and geometric computational data for determining prayer times are presented here.

Calculation Method	Regions in Common Use	Angle of the sun under the horizon (Fajr)	Angle of the sun under the horizon (Isha)
Egyptian General Authority of Survey	Africa, Syria, Iraq, Lebanon, Malysia, Parts of USA	19.5°	17.5°
Islamic Society of North America	Parts of USA, Canada, Parts of UK	15°	15°
Majlis Ugama Islam Singapura	Singapore region	20°	18°
Umm al-Qura University, Makkah	Arabian Peninsula	18.5	90 minutes after Maghrib. 120 minutes after Maghrib during Ramadan.
Muslim World League	Europe, Far East, Parts of the USA	18°	17°
Union des Organisations Islamiques de France	France region	12°	12°
University of Islamic Sciences, Karachi	Pakistan, Bangladesh, India, Afghanistan, Parts of Europe	18°	18°
Department of Islamic Affairs and Charitable Activities (IACAD)	Dubai	N/A	N/A

APPENDIX C: DISCLAIMER

Forward Thinking Designs assumes no responsibility or liability for any errors or omissions in the functionality or time accuracy of this plugin. The information contained in this plugin is provided on an "as-is" basis with no guarantees of completeness, accuracy, usefulness, or timeliness.

SUPPORT

Middle East

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