

# **OMNEO Discovery**

## **Q-SYS Plugin**



## Release Notes

Release Date	Version	Changes
09/2020	V0.0.1	<ul style="list-style-type: none"><li>• Early adopters preview.</li></ul>
02/2021	V1.0.0	<ul style="list-style-type: none"><li>• First release.</li></ul>
04/2022	V1.0.1	<ul style="list-style-type: none"><li>• Fixed a bug that may prevent the discovery plugin from recovering properly if a device is taken offline during the discovery process.</li></ul>
06/2025	V2.0.0	<ul style="list-style-type: none"><li>• Updated to support discovery of Dynacord IX Series amplifiers.</li><li>• Added a combo box to allow system programmer to specify which network interface to use on the Q-SYS Core.</li><li>• Improvements to underlying mDNS discovery implementation (RFC 6762) including optimisations for larger numbers of DNS-SD records, known answer suppression, and improved handling to resolve service instances when an IP address change occurs.</li><li>• Added 'Cache' page to provide useful diagnostic information and insights into DNS-SD records being processed by the plugin.</li></ul>

# Introduction

OMNEO is a media networking architecture that combines studio-quality multi-channel audio and a common control system over standard IT networks. OMNEO's media transport uses Dante, while the control system uses Open Control Architecture (OCA). OCA is an open public standard, also known as AES70, for control and monitoring of professional media networks.

The plugin allows you to discover OMNEO enabled devices on a network, and connect to them by name without having to worry about IP addressing or TCP/IP port numbers. As devices are discovered, this plugin sends all the connection information to other Dynacord plugin components in your Q-SYS project, so you can simply select the device you want to control and connect.

The plugin then continues to monitor the network ensuring the list of discovered devices is always up to date as hardware is added and removed.

Because the plugin shares the information with all other Dynacord plugins, only one Discovery plugin is required per Q-SYS design. This ensures network resources are not unnecessarily wasted by each plugin having to maintain its own discovery mechanism.

This guide explains how to integrate the plugin into a Q-SYS design.

More information about Q-SYS and the Q-SYS Designer software can be found on the QSC website at; <https://www.qsc.com/resources/software-and-firmware/q-sys-designer-software/>

More information about OMNEO can be found on the Dynacord website at;  
<https://dynacord.com/technology/omneo/>

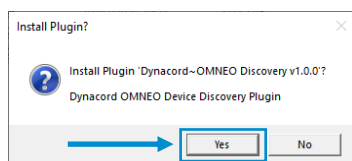
# 1. Installing the plugin

The plugin was developed and tested with Q-SYS Designer v9.13. Although untested, it should also work with earlier versions from v9.5 onwards. The latest version can be downloaded from the QSC website. If necessary, install Q-SYS Designer following the instructions given by QSC.

**Note:** Plugins use the Q-SYS Scripting Engine, which is a licensed feature on certain Cores. You may need to purchase and install a feature license from QSC in order to deploy this plugin on a Core. More information can be found in the Q-SYS Designer Help and on the QSC website.

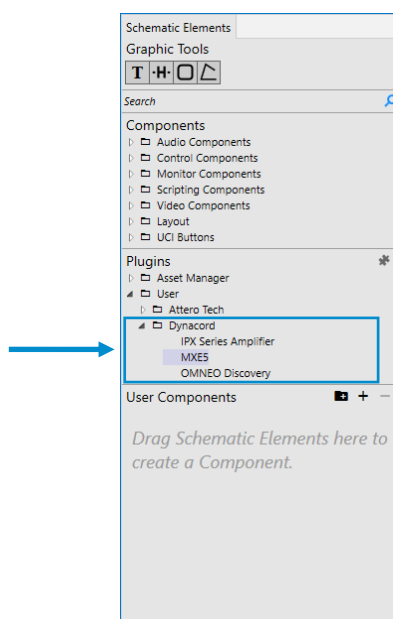
To install the plugin:

1. Double-click the plugin file **Dynacord OMNEO Discovery vx.x.x.qplugx** then click **Yes** in the confirmation dialog to complete the installation.



2. Open Q-SYS Designer. The plugin is located in the right-side **Schematic Elements** pane. It can be found in the Plugins section by expanding the menu option, **User > Dynacord**.
3. The plugin is now installed and ready for use in your Q-SYS designs.

You can also manually install the plugin by copying the file into the Plugins folder (typically located) at: C:\Users\username\Documents\QSC\Q-Sys Designer\Plugins



## 2. Removing the plugin

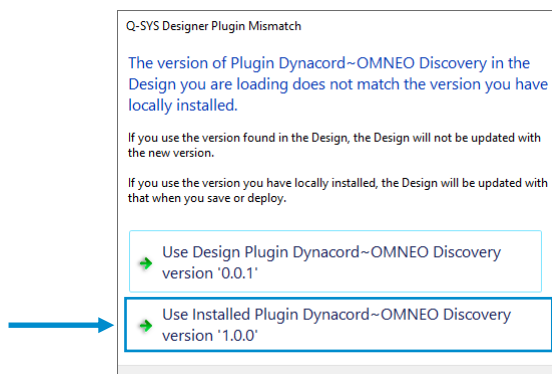
If you need to remove the plugin you can do this by deleting it from the Plugins folder at:  
`C:\Users\username\Documents\QSC\Q-Sys Designer\Plugins`

**Note:** This will not remove the plugin from any of your design projects. If you need to remove it from a design you will need to manually delete each plugin component added to the design.

## 3. Updating the plugin

If a newer version of the plugin becomes available you can update it by following the procedure to install the plugin above. Once the newer version is installed, Q-SYS Designer will ask if you want to update to that version when you next open a design containing the plugin.

Select the option to **Use Installed Plugin** to update the design. The design will be updated when you next save and deploy it.

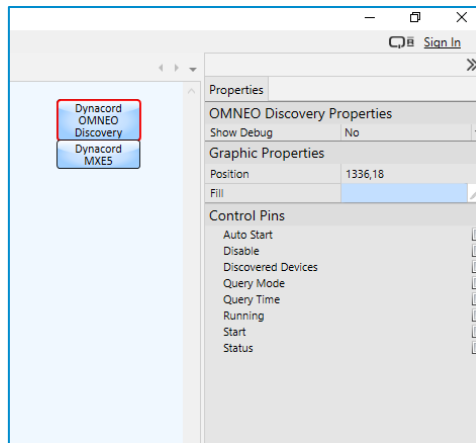


**Note:** If you don't want to update the plugin at this time select the option to **Use Design Plugin** instead.

## 4. Plugin overview

Drag an **OMNEO Discovery** component, and a Dynacord device component (e.g. an **MXE5**) from the **Plugins** pane onto the **Schematic**. Click the OMNEO Discovery component to select it. This will also display its properties in the right-hand **Properties** pane of Q-SYS Designer.

**Note:** Only one OMNEO Discovery component is required in each Q-SYS design as it shares the discovery information with all other Dynacord plugins.



### Properties

**Show Debug:** Combo box with Yes/No option, the default is No. When set to Yes, the plugin will display the Q-SYS Debug Output window below the device's control panel. The Debug Output window displays error and status messages while the plugin is running. These messages are written to the Debug Window even in emulation mode enabling you to test it before deploying to your Core.

### Graphic Properties

**Position:** Coordinates of the plugin component on the Schematic page.

**Fill:** Sets the background colour of the plugin component.

Refer to the Q-SYS Designer Help for more information on Graphic Properties.

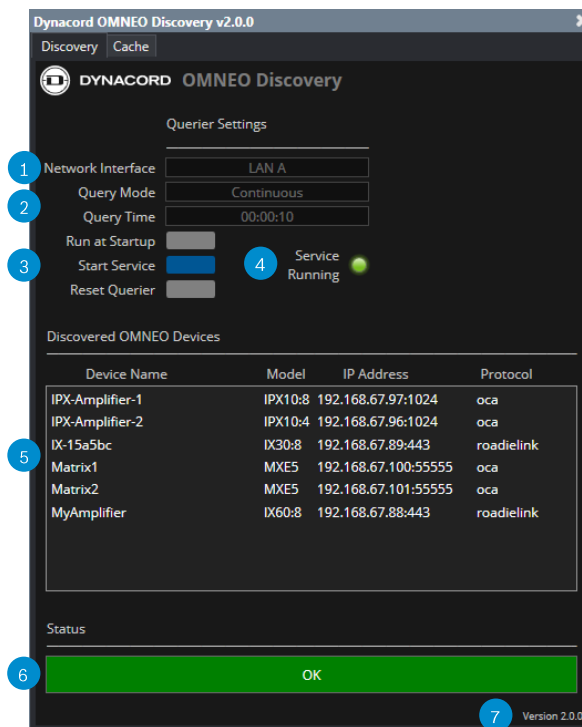
### Control Pins

Control Pins are an advanced Q-SYS Designer function that enable controlling and monitoring of many of the plugin components parameters via other Q-SYS Control Components.

Using Control Pins and Control Components is beyond the scope of this user guide. However, there are a couple of simple examples shown in the MXE5 plugin user guide, section **Getting Started**. Refer to the Q-SYS Designer Help for more examples of using Control Pins.

## Discovery Control Panel

Double-click the component to open its control panel.



1. **Network Interface:** Combo box to select the network interface on your Core which will send and receive DNS-SD discovery messages. This must be the network interface your Dynacord components are connected to. Not available while the service is running. Stop the service to change the network interface.
2. **Query Mode:** Combo box to select whether discovery will run continuously or for a set amount of time. Not available while the service is running. Stop the service to change the query mode.
  - **Continuous:** Once discovery has started it will continue to run until either it is manually stopped, or the Q-SYS Core is powered down.
  - **One time:** Once discovery has started it will run for the amount of time entered in the 'Query Time' box and then stop.

**Query Time:** The amount of time a 'One time' query will run for. This box is disabled (and the value ignored) whilst 'Continuous' query mode is selected. Enter a value between 5 seconds and 1 hour to suit your application. Discovery can take several seconds, especially on a busy network with a large number of OMNEO devices. Making the query time too short may mean not all devices are discovered before it stops.

**Tip:** If it is unlikely that any of the TCP/IP settings for devices on your network will to change (e.g. you are using static addressing), you could select 'One time' query mode to obtain device IP addresses just once at startup. However, if you are using DHCP or link local IP addressing, it is possible that the IP address of a device will change if it is power cycled or rebooted. At which point

you would need to run the one-time query again to discover these new settings. Continuous query mode will automatically detect changes in TCP/IP settings thus ensuring maximum up-time and minimum user intervention. Therefore, continuous mode is recommended for most applications unless all OMNEO devices on your network have been assigned static IP addresses.

3. **Run at Startup:** When this button is enabled (blue background = enabled) the plugin component will automatically start the discovery service whenever the design is saved to the Core, or the Core is rebooted/power cycled.

**Start Service:** Toggle this button to manually start and stop the discovery service (blue background = started).

**Reset Querier:** Resets the querier to its initial state and clears the cache. This is the equivalent of stopping and restarting the querier but without resetting the network connections.

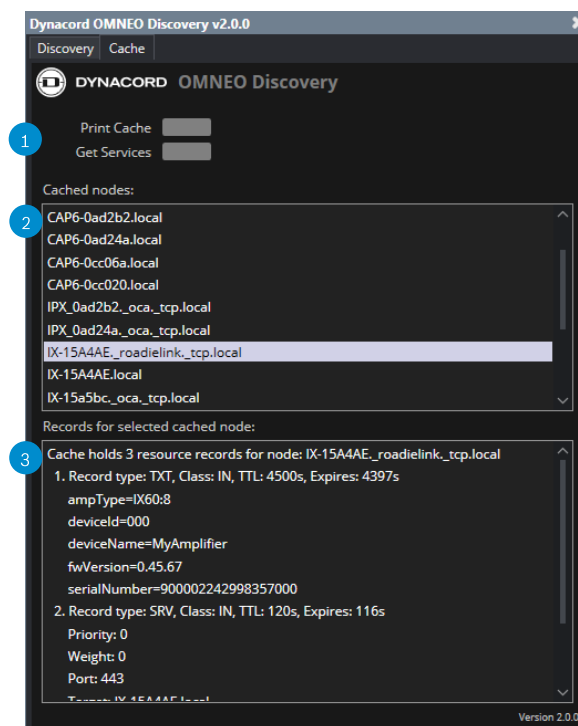
4. **Service Running LED:** Glows green when the discovery service is running.
5. **Discovered OMNEO Devices:** List box displays the discovered OMNEO devices. Scrollbars appear when more devices are found than can fit in the display area. Each record in the list displays the device name, the device type, its current IP address and port number, and the service protocol it is hosting. Notifications are also sent to other Dynacord plugins containing this same information. The device plugins then use this information to establish a connection with the actual device.
6. **Status:** Displays the current status of the discovery plugin;
  - Grey – Offline: Discovery is not running or the network interface hasn't been selected. The status message will indicate if there is a problem when attempting to start the querier.
  - Green – OK: Discovery is running.
7. **Plugin version:** Displays the major.minor.build version of the plugin.

**Note:** Discovery uses the DNS-SD service discovery protocol which relies heavily on multicast ethernet packets. If your network utilizes managed network switches and/or a firewall they may require additional setup steps to ensure this multicast data can pass through the network properly. Both the Q-SYS Core, and the OMNEO device(s) you want to connect to, must have an IP address in the same range on the same subnet. The OMNEO devices also need to be connected to the same network as the Q-SYS Core network interface selected on the plugin. Device IP addresses can be assigned using a DHCP server, static IP addresses, or link local addressing (automatic IP assignment where a DHCP server is not available). Correct setup of the network is beyond the scope of this user guide as there are many different variables to consider, especially when integrating the control system into a corporate network environment. However, it is an essential step for reliable operation especially if discovered devices regularly appear and then disappear, as this indicates the presences of an IGMP Querier but incorrectly configured IGMP Snooping settings.



DNS-SD is based on mDNS and all multicast discovery traffic is on address 224.0.0.251:5353. The plugin also communicates with discovered devices with unicast OCA messages on the TCP/IP address and port number identified during the discovery process. By design mDNS is not a routable protocol. If you need to split any of your OMNEO devices across different subnets to the Core they will need to be configured with static IP addresses. For such networks, rather than using the discovery plugin, you will instead need to use the same static IP address assigned to the device in the device specific plugin. You will also need to configure your network to route unicast TCP/IP traffic between subnets appropriately.

## Cache Control Panel



The Cache control panel can be a useful diagnostic tool for viewing OMNEO related DNS-SD records being cached by the plugin. Although it may not be relevant to basic device discovery (all the essential information and settings are on the Discovery page of the plugin), advanced users may appreciate some of the information and network insights it can provide, especially when troubleshooting network related discovery issues.

1. **Print Cache:** Prints all cached records to the debug output window (enable the **Show Debug** property to see the debug window). As cached records may change over time, printing the cache will give you a snapshot of information held at a particular point in time. This can be particularly useful if you auto save the debug output to a file. See Q-SYS help for more details on the available options for the debug output window.
2. **Get Services:** Sends a service discovery message to the network. All responses are collated under the `<_services.dns-sd._udp.local>` node. Select this node from the **Cached nodes** list to view the list of records. Service discovery is used to find out what services are being advertised by different devices on the network. Many devices, such as IP printers and Dante, use DNS-SD

and mDNS for discovery, so service discovery can give you useful insights into what services are actually available on the network.

3. **Cached nodes list:** Displays a list of nodes responding to DNS-SD queries. A node may be a set of records for an individual device, a set of records related to a specific service available on the network, or a set of address records related to a specific host that is advertising one or more of those services. Select a node from the list to see the available records in the **Records** list box below.

DNS-SD uses the same record types as DNS does for name resolution on the general internet. When a device responds to a discovery message sent by a querier (such as this plugin) it will typically send a response containing multiple records. This allows the DNS-SD protocol to resolve data in these records to find the IP address and port number the device will accept connects to a particular service on. In the case of OMNEO devices, the service protocol will either be 'oca' or 'roadielink'. When a record is sent it also has an accompanying Time-to-Live (TTL) value to tell a querier how long the record should remain valid for. After this time has elapsed, if the querier hasn't receive other responses from the device to update the TTL value, it will remove the record(s) from the cache. The cached nodes list can give you useful insights into what oca and roadielink messages are currently being held in memory on the Q-SYS Core and whether they are being refreshed correctly before the TTL expires. The querier will start to send out messages for a device to update its TTL information close to the time of expiry. If it receives a response the TTL is updated, if not, after several retries, the querier will assume the device is no longer on the network and remove all cached records related to the device.

As DNS-SD is dynamic in nature, the list of cached nodes is therefore likely to change over time as devices come and go from the network.

4. **Records list:** Displays the set of resource records held for the node selected in the **Cached nodes** list. As well as the record information, the 'Expires:' field shows how long (in seconds) is remaining before the TTL for the record needs to be updated again by the host device.

**Tip:** Because of how Q-SYS list boxes work, if you want to refresh the records for a selected node, you will need to first select a different node, then return to the required node. Simply clicking on a selected node again will not update the record details.

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**Bosch Security Systems, LLC**

130 Perington Parkway

Fairport, NY 14450, USA

[www.dynacord.com](http://www.dynacord.com)

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