DUKANE

Barcode and QR Code Scanning Through iQ Explorer 3

Application Note AN539

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Introduction

This document will explain how to integrate a barcode scanner or a QR code scanner into your Dukane ultrasonic welder through iQ Explorer 3. It will explain the different methods available, as well as the features included in each method. This document will also include examples of how the iQ Explorer 3 interface works differently when barcode scanning is enabled.

Note that throughout the rest of this document, when the term barcode is used, it is meant to refer to barcodes or QR codes.

Connecting a Barcode Scanner

There are various kinds of barcode scanners on the market. This section is an explanation of the requirements for connecting to the PC on which iQ Explorer 3 is running.

The most reliable connection from one of these scanners is via an RS-232 connection between the scanner and one of the available COM ports on the HMI (Panel PC) that you can purchase from Dukane. In lieu of that, it is possible to connect a scanner with a USB connection. However, with a USB connection, iQ Explorer 3 requires that the connection presents itself as a COM device. Note that this type of connection is likely to require a device driver, which would be provided by the barcode scanner supplier.

Regardless of an RS-232 or USB connection, when a connection to a COM port is made, iQ Explorer 3 requires that the scanner is configured to communicate with the following settings:
9600 baud,
7 data bits,
1 stop bit,
even parity,
and a <CR> terminator.

Barcode scanners can be configured to communicate through a COM port with many combinations of settings. The above communication settings are the classic default barcode scanner COM settings. Every scanner that can communicate through a COM port is expected to support these communication settings.

Barcode scanners are also available in a keyboard wedge interface style. This kind of connection will submit a barcode that has been scanned into a series of keyboard touches. Combined with a support setting in iQ Explorer 3, this barcode scanner can be made to work, but there are system conditions where it may not function as expected.

Types of Barcode Scanning

Barcode Scans per Part to Weld

This type of support involves barcode assignments per part.

The operator is prompted to scan a barcode affixed to the part to be welded. After the weld is complete, the scanned barcode will be included in the cycle data and graph data of the welded part.

Welding is suspended until a new barcode is scanned.

Barcode Scans to Activate a Setup

This type of support involves barcode assignments on tooling, which will be used to load a Setup that is known to work with the identified tooling.

The operator is prompted to scan barcodes identifying specific tools that are installed (horn, fixture, etc.). After the set of barcodes have been scanned, the Setup that has been assigned to the combination of barcodes is activated. If the Setup is not already loaded into the press generator, it will automatically be loaded into an available Setup slot.

Welding is suspended until sufficient barcodes are scanned to load a Setup.

Note that none of these barcodes that are scanned are stored in cycle data after parts are welded. The Setup name that is linked to the scanned barcodes will be stored in cycle data.

Barcode Scans per Part to Weld

This type of support works when scanning a barcode that has been affixed to the part that is about to be welded.

At any time, the operator can press this button  on the toolbar to clear a scanned barcode and refresh the prompt for another barcode to scan. This button resets the process that guides the operator to scan a barcode on the next part to be welded.

Note that welding is not permitted until a barcode has been successfully scanned.

Additional Features

Lot Barcodes

If the operator has parts that require a unique barcode per lot, this barcode can be integrated into this feature. If this feature is enabled, the operator will see a popup that identifies when to scan the barcode for that batch of parts. The same lot barcode will be stored in cycle data for each part welded.

When the operator needs to weld the next batch of parts, press this  button on the toolbar to clear the barcode assigned to the previous lot. Following this button push, the operator will see the prompt to scan a new barcode for the new lot.

Permit Manual Barcode Entry

When this feature is enabled, when notified to scan a barcode, a popup will contain an edit box to allow the operator to enter in the barcode manually.
This feature must be enabled when using a keyboard wedge style barcode scanner. When using a keyboard wedge barcode scanner, the topmost window will display the barcode that is scanned.

Barcode Length Limits

The administrator can define an upper limit and lower limit to the number of characters permitted in a barcode scan.

Attach Barcode to Graph Data

When this feature is enabled, the barcode of scanned part will be displayed in the title of the graphs generated from a weld.

Acknowledge Barcode Scans with a Popup

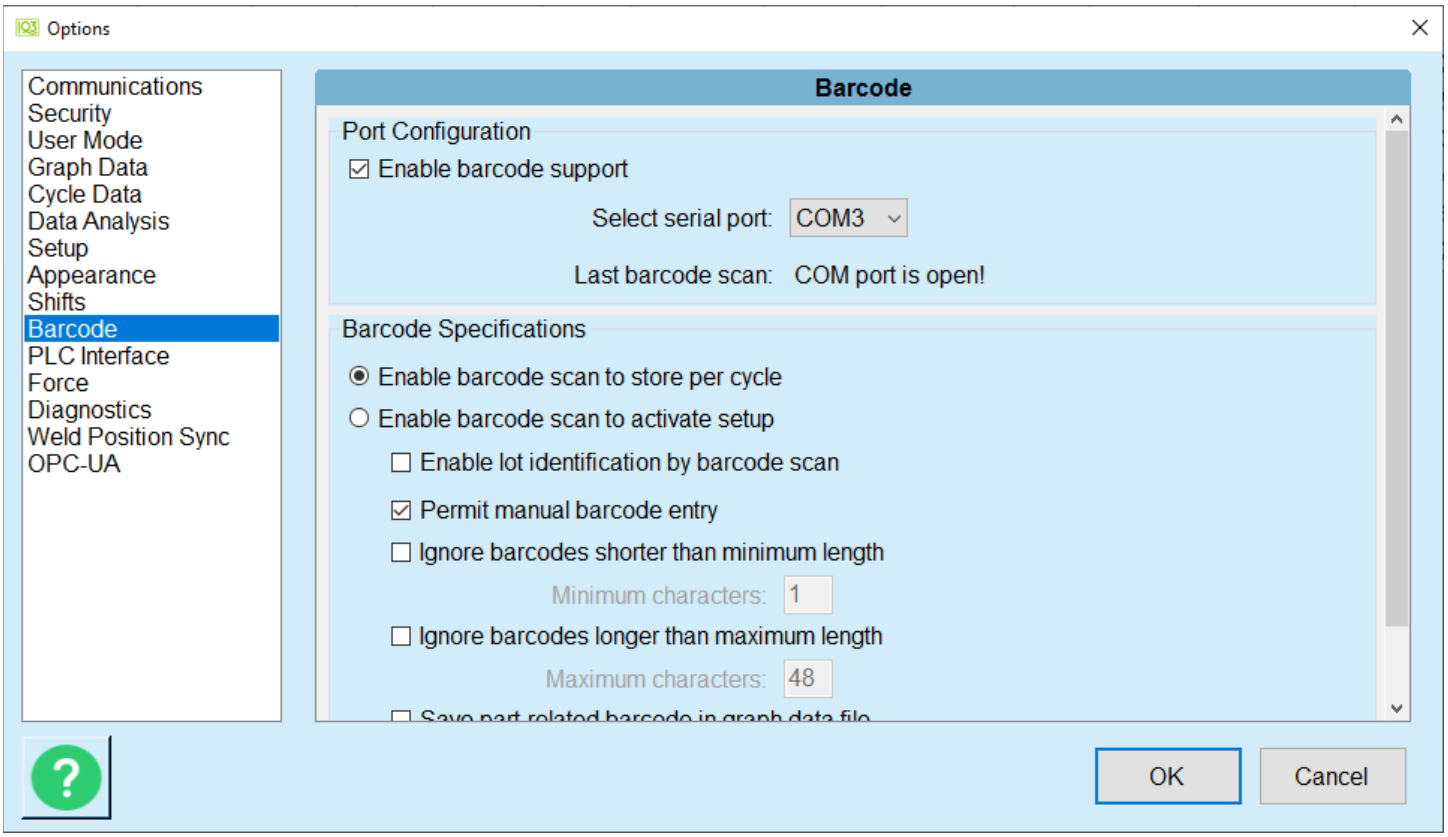
When this feature is enabled, a popup will be displayed after the barcode has been scanned and processed.

The default setting for this popup is enabled.

Example

The following example will illustrate how to configure a barcode per part setting and the prompts the operator will see when this feature is active. The first step is to enable barcode support and enable the style of barcode scanning to use.

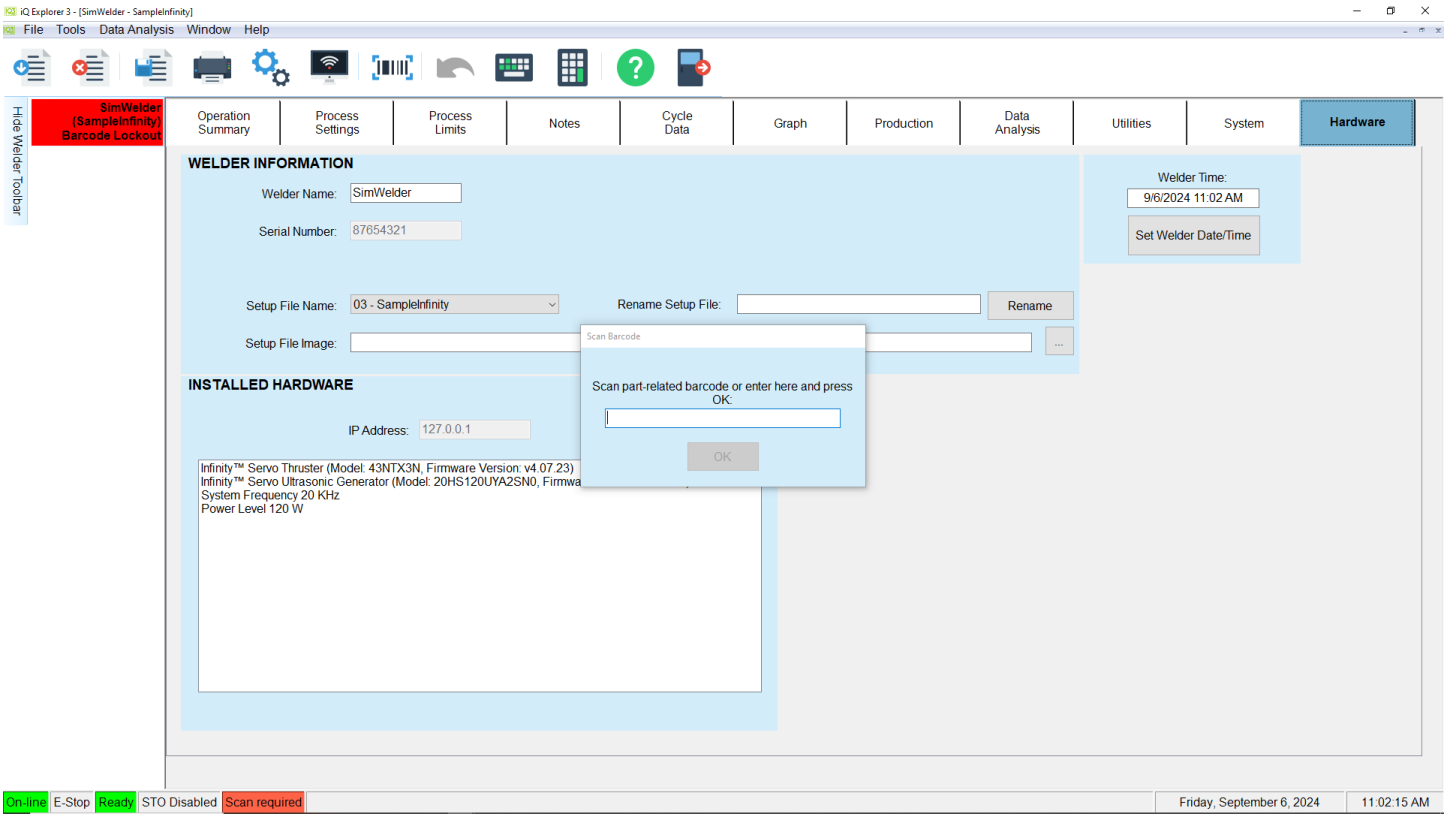
Press this button on the toolbar to open the Options settings.



In the Barcode tab, scroll down to view the complete set of options available for this barcode scanning selection.

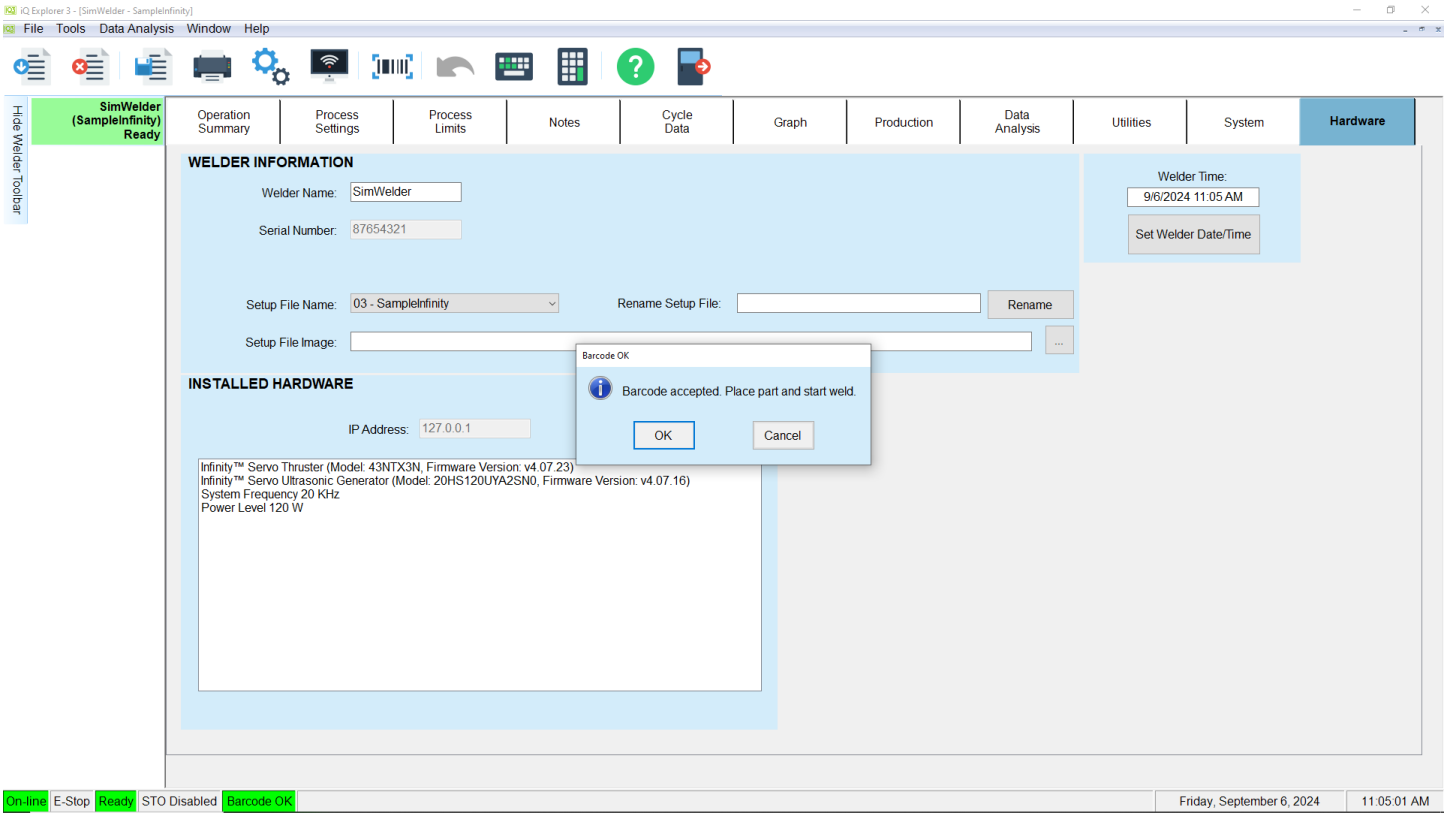
Press the “OK” button in the Options settings.

iQ Explorer 3 will prevent the generator from performing a weld and will display a prompt for the barcode scan.



In this case the operator can manually enter a barcode or scan a barcode.

You'll see the following prompt following a succesful barcode scan.



iQ Explorer will release the generator from its welding restriction, and it will operate normally.

After the weld is complete, the operator will be prompted for another barcode before permitting another weld.

Barcode Scans to Activate a Setup

This type of support involves barcode scans affixed to tooling for the purpose of loading a Setup that is configured to function with that tooling.

When the operator identifies that they need to change tooling, press this button  on the toolbar to reset previously scanned barcodes and refresh the prompt for the next tool to scan.

Note that welding is not permitted until a Setup is loaded due to these barcode scans.

Additional Features

One, Two, or Three Barcode Scans per Setup

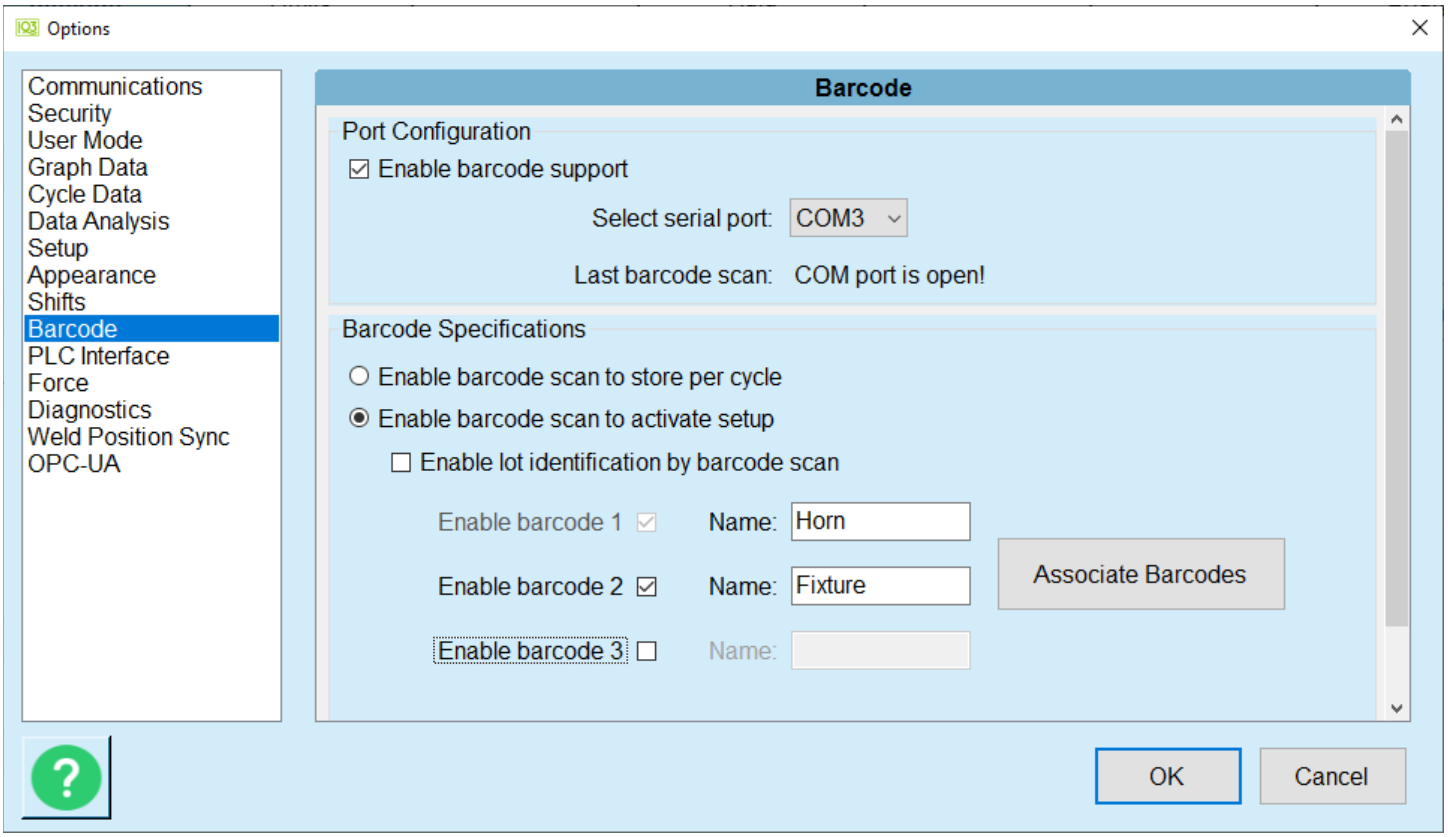
At least one barcode scan is required to associate with a Setup. The administrator must assign an alphanumeric name to the scan sequence. This name will be used in the message that will prompt the operator to scan the barcode.
Up to three tools may be scanned to load a Setup.

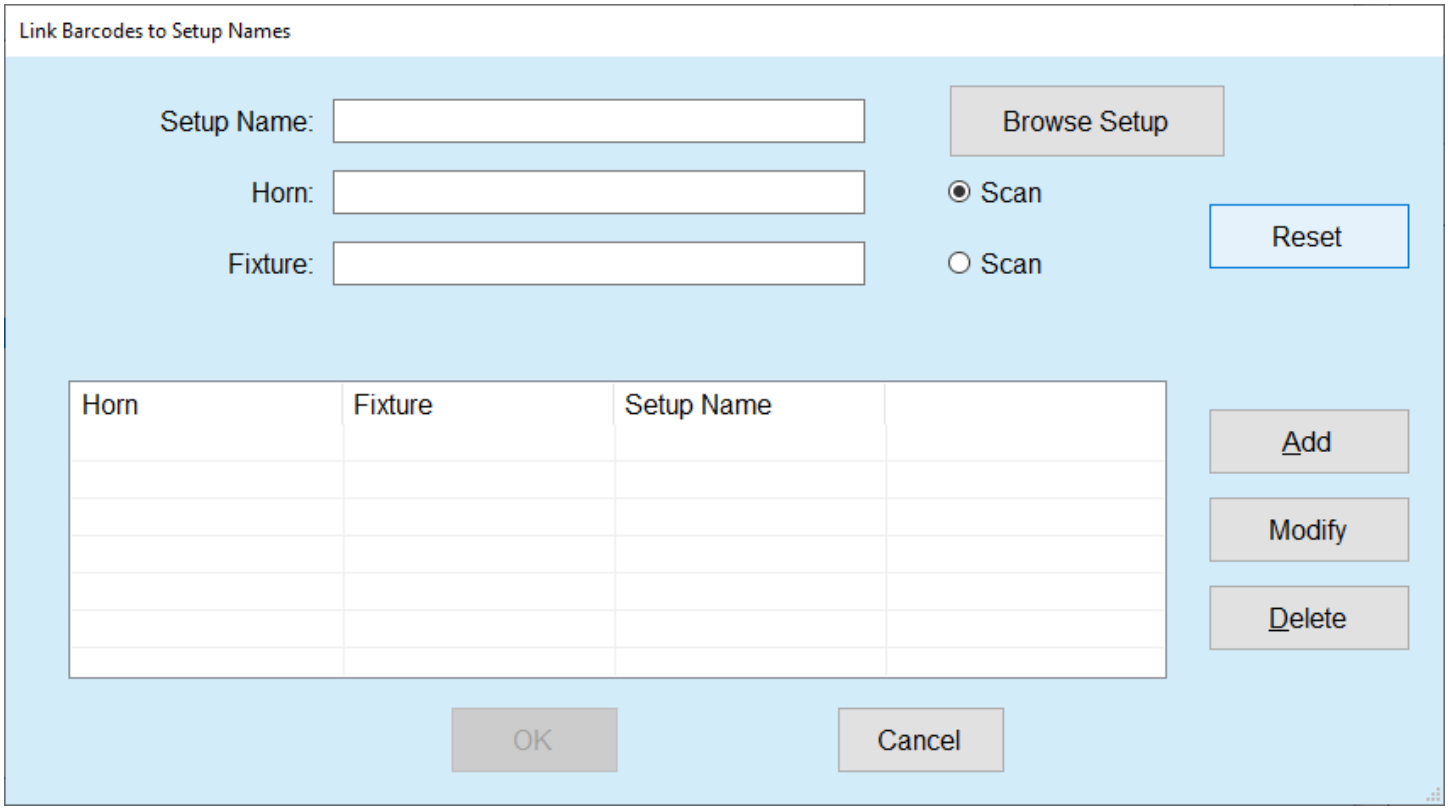
Lot Barcodes

If the operator has parts that require a unique barcode per lot, this barcode scan can be integrated into this feature. If this feature is enabled, the operator will see a popup that identifies when to scan the barcode for that batch of parts. The same lot barcode will be stored in cycle data for each part welded.
When the operator needs to weld the next batch of parts, press this  button on the toolbar to clear the barcode assigned to the previous lot. Following this button push, the operator will see the prompt to scan a new barcode for the new lot.

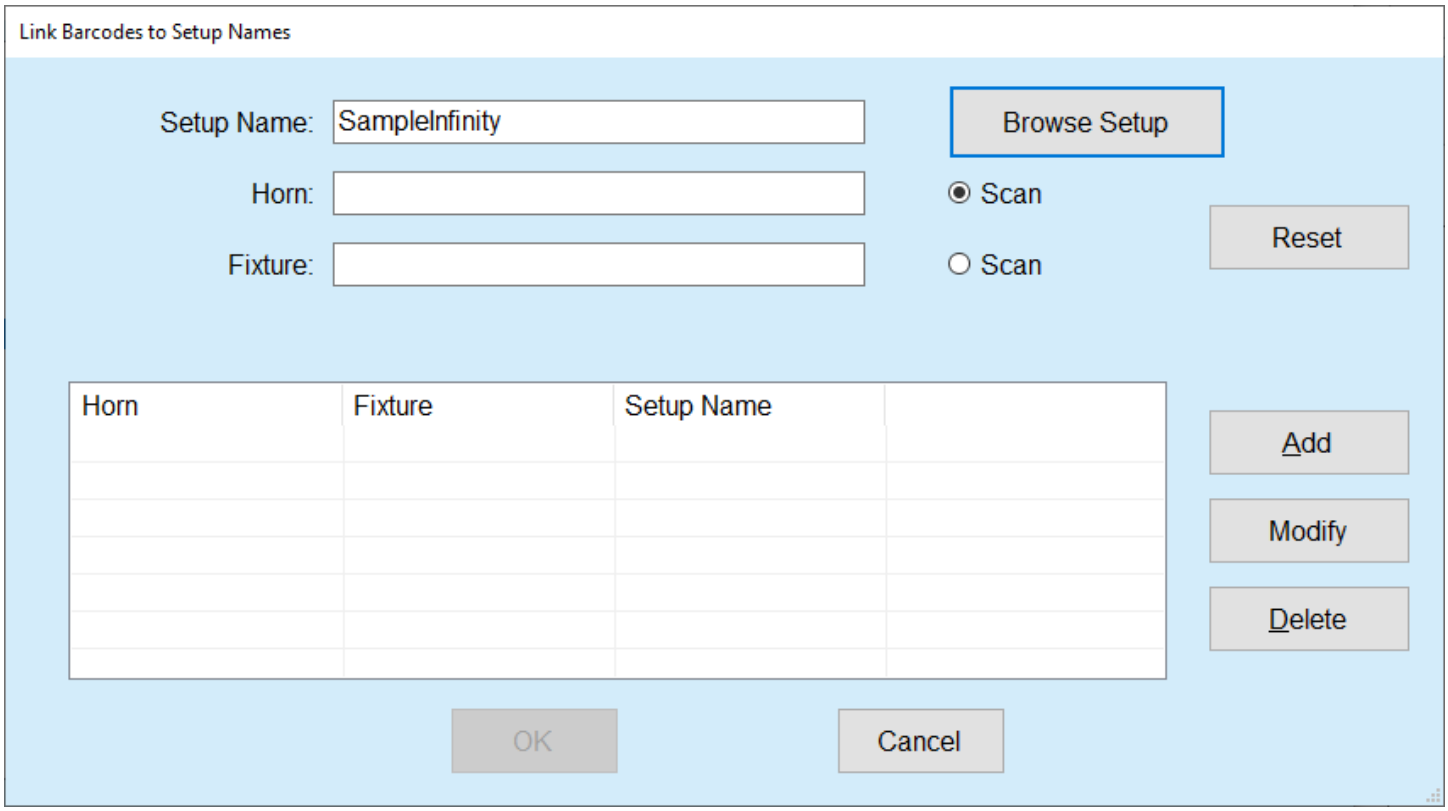
Example

The following example will illustrate two barcode scans to load a Setup. The first step is to enable barcode support, enable the style of barcode scanning to use, and identify the names of the barcode scan sequence. Press this button on the toolbar to open the Options settings.

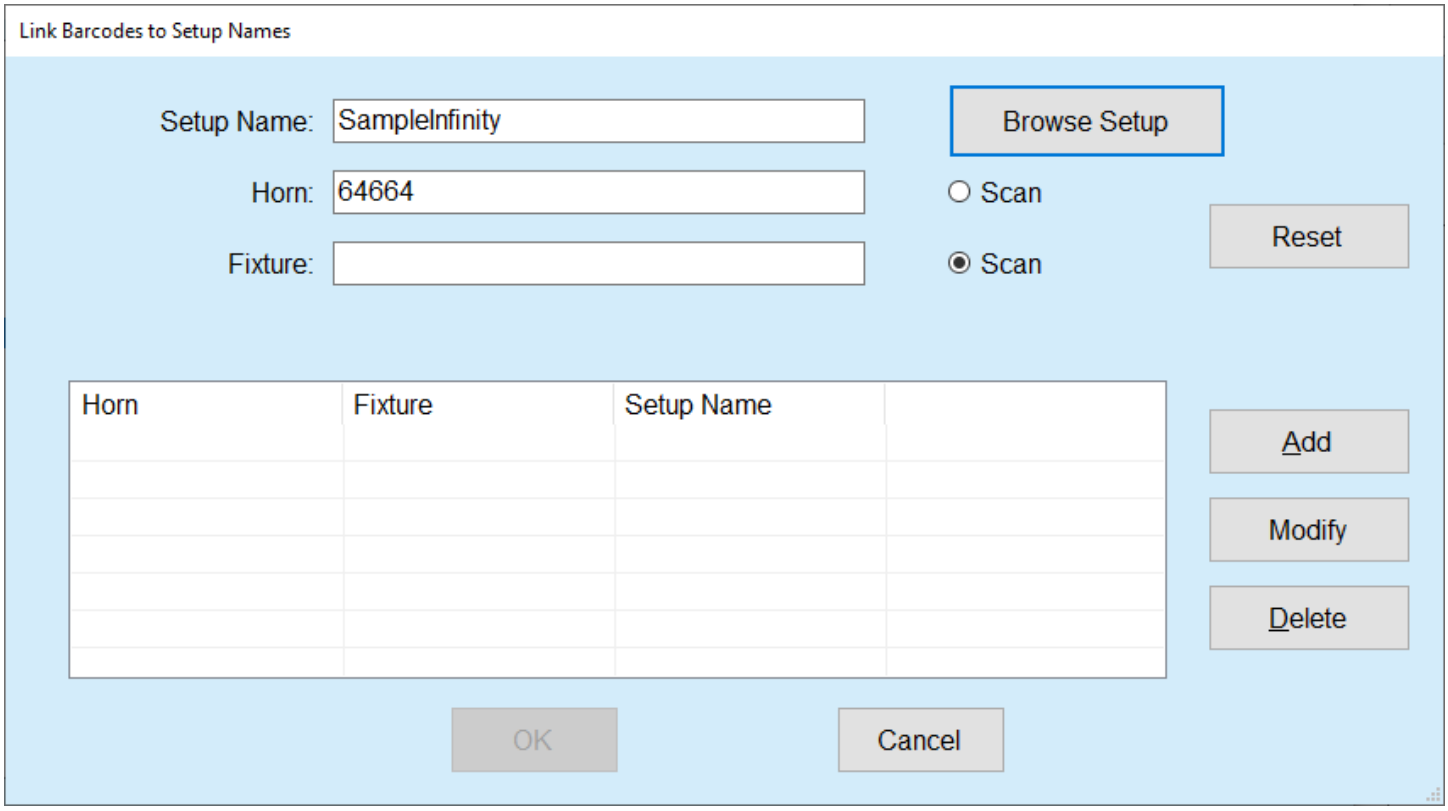




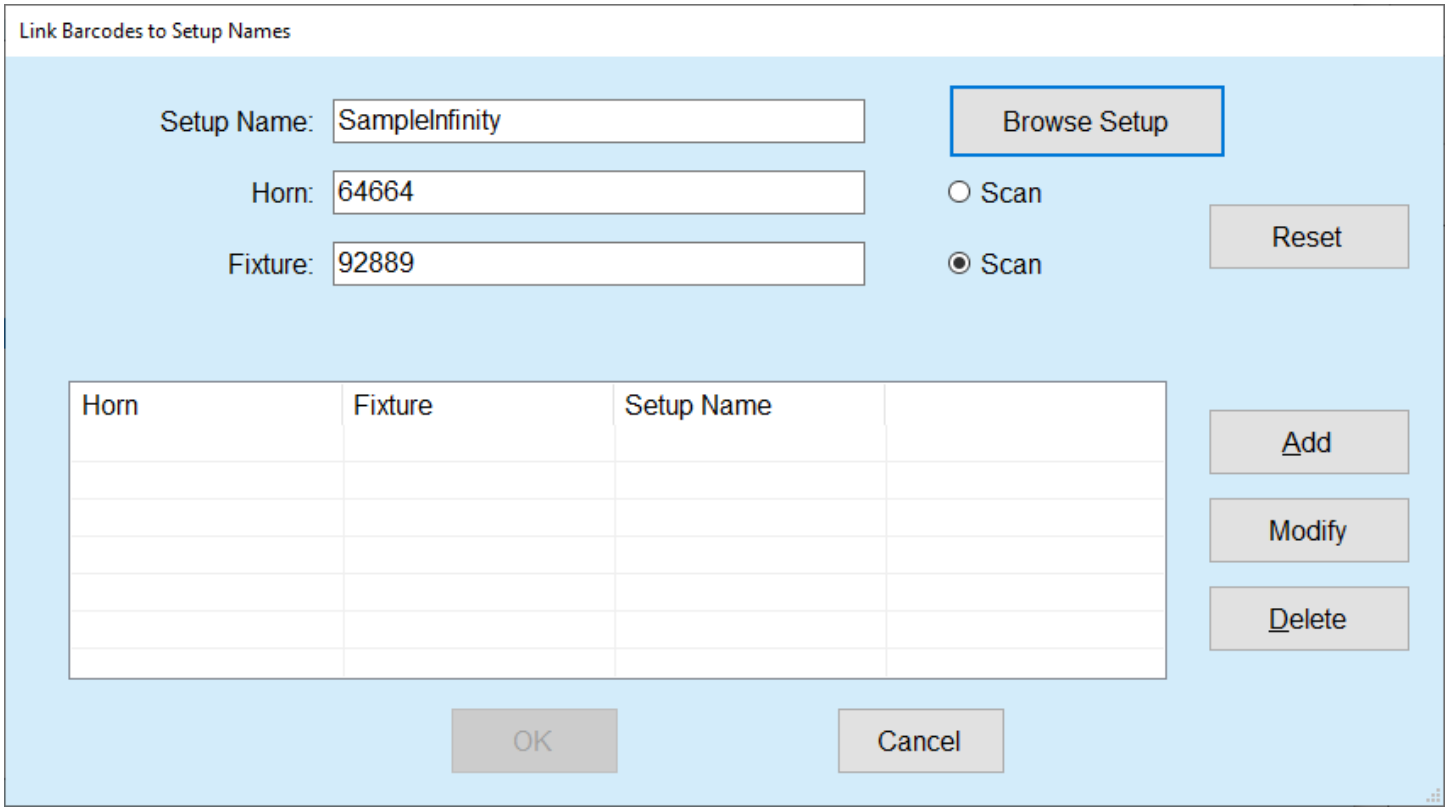
Select a Setup that has been stored in iQ Explorer 3.



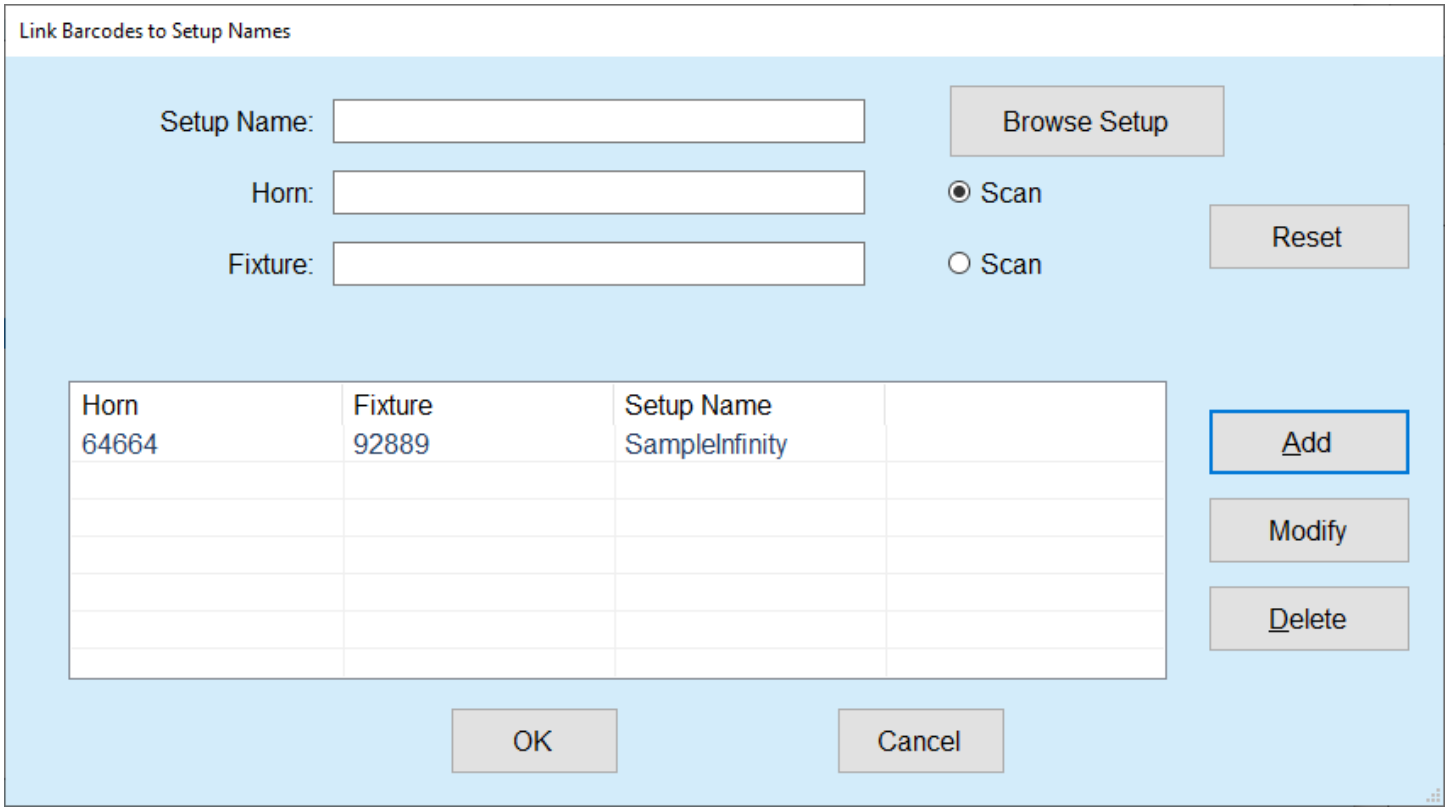
Scan a barcode for the first in sequence, “Horn”.



Scan a barcode for the second in sequence, “Fixture”.

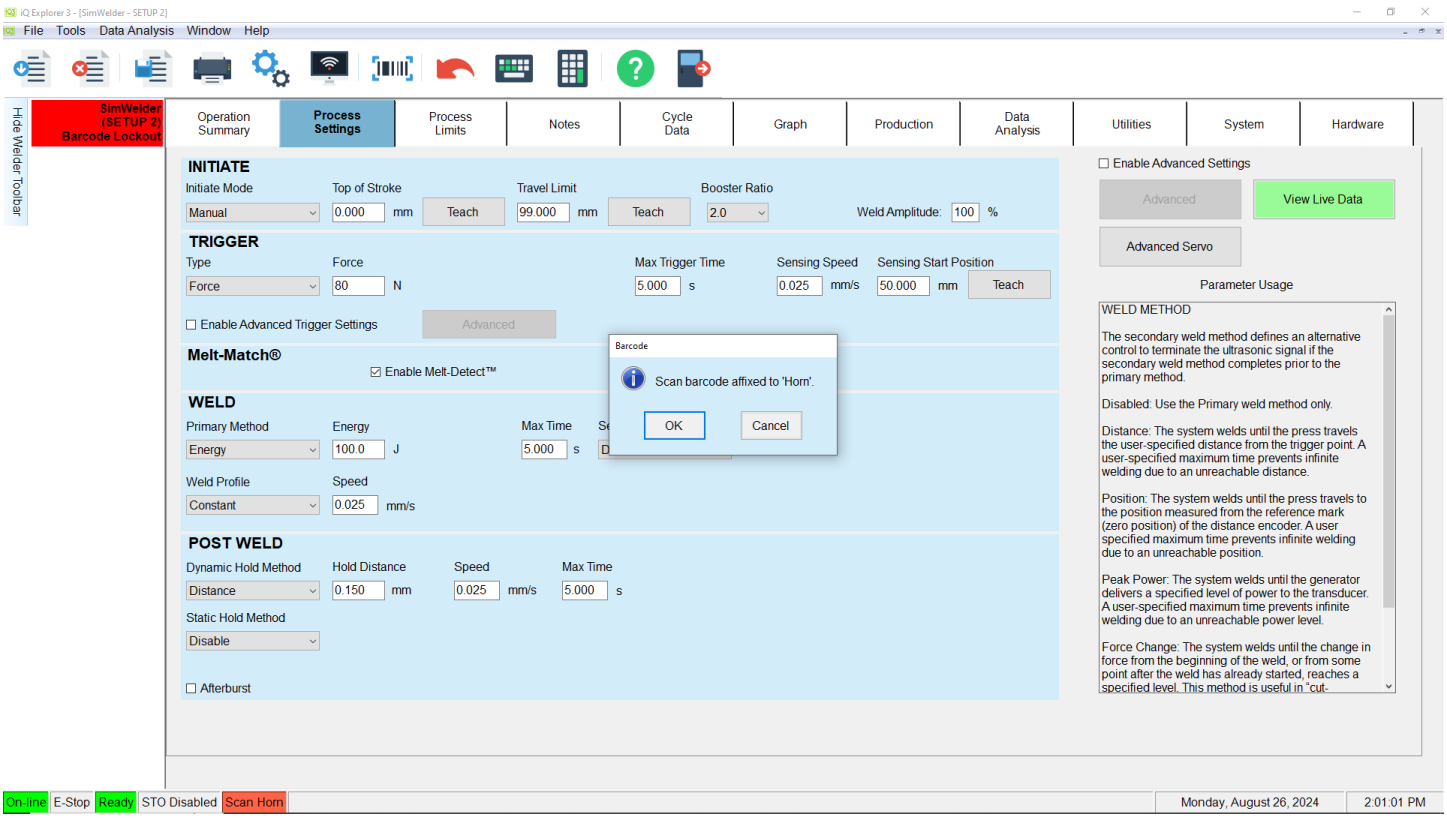


Press the “Add” button.



Press the “OK” button to apply the association.
Press the “OK” button in the Options settings.

Press the reset barcode button in the toolbar and you'll see a popup like what is shown below.



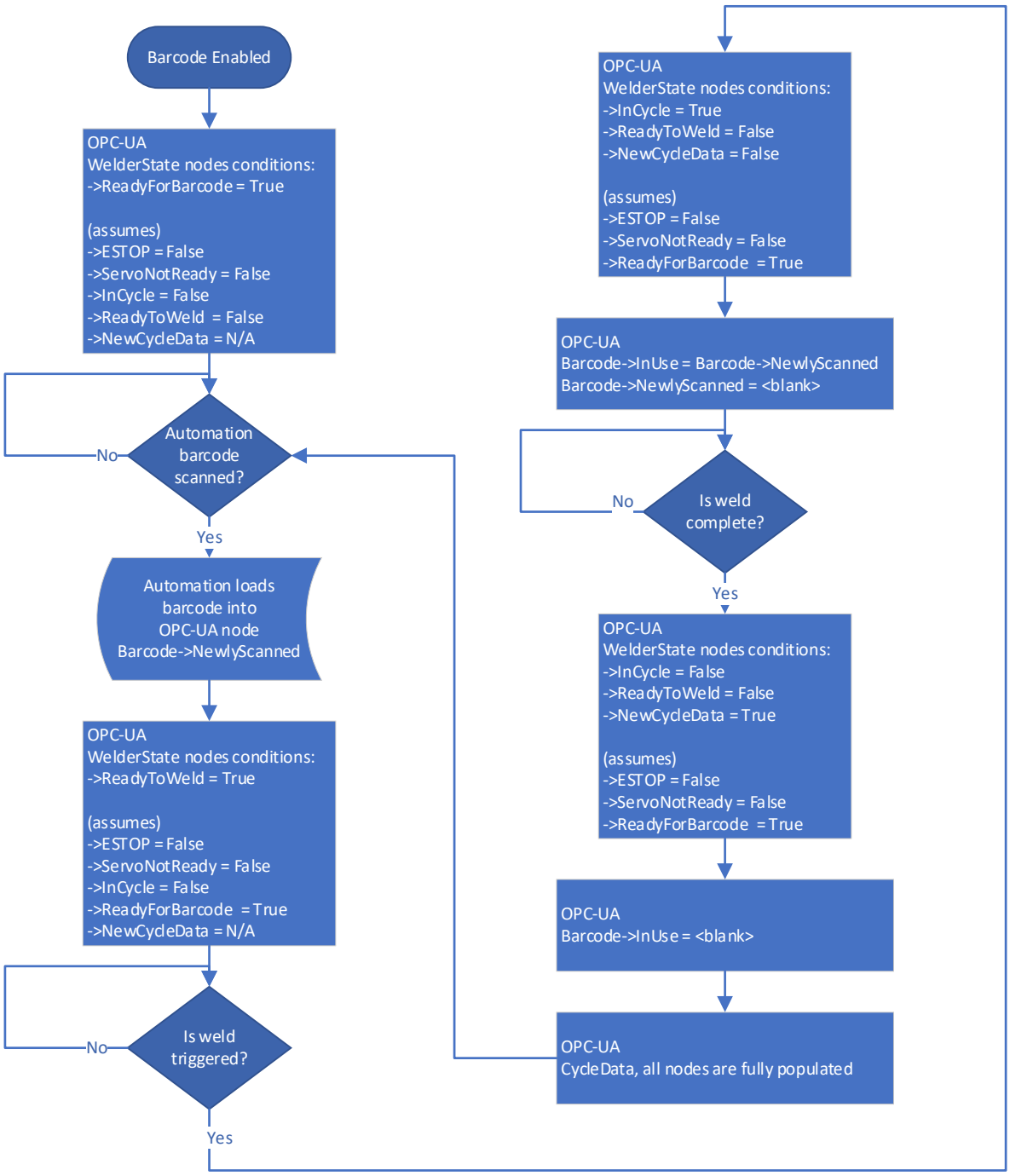
After this first barcode is scanned, as we continue to follow this example, a second popup requesting a barcode scan for the "Fixture" will be prompted. After that second barcode scan, the Setup assigned to this pair of barcode scans will be activated. If the Setup doesn't already exist in the generator that it will be loaded from file, and immediately activated. The press will now permit executing a weld.
If there exists no Setup associated with this pair of barcode scans, or if the setup file no longer exists on this HMI, the operator will be notified about the unknown barcode, then prompted to rescan the first barcode to identify the "Horn" (continuing to follow this example).

Barcode Scanning Using OPC-UA

When using the method to apply barcode scans to parts for welding, if the administrator has installed the OPC-UA software expansion, it can be used as the means to input barcodes. This would be an alternative means to the COM port interface that has previously been defined in the document.

Both OPC-UA must be enabled and barcode support per welded part must be enabled.

See the flowchart below for the example of how to use the OPC-UA client nodes available to the systems integrator.



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The website has information about our products, processes, solutions, and technical data. Downloads are available for many kinds of literature.

This is the address for the main website:
www.dukane.com

Local Representative

You can locate your local representative at:
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