EPSON

111-38-URM-008

Epson KDS

Functional Specification

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Table of Contents

1. The Epson Omnilink KDS Solution 4
1.1. Software Versions 4
1.2. System Architecture 4
1.2.1. Single Station Setup 5
1.2.2. Migrating from Single-Station to Multi-Station 6
1.2.3. Sample Multi Station Setup – KDS Menu Routing 7
1.2.4. Sample Multi Station Setup – POS Menu Routing 8
1.3. Epson Supplied Hardware 9
1.4. Supported Connectivity to POS 9
1.5. Screen Support 9
1.6. Touchscreen Support 9
1.7. Bump bar Support 9
1.8. Sound Support 10
1.8.1. USB Speakers 10
1.8.2. USB Audio Adapter 11
2. KDS Parsers and API 12
3. KDS Display 13
3.1. Display Header 13
3.2. Supported Tile Arrangements 14
3.3. Order Tiles 14
3.3.1. Tile Header Color 14
3.3.2. Quantity or Seat 15
3.3.3. Order contents 15
3.3.4. Order appends 15
3.3.5. Displaying Other Information 16
3.3.6. Order Appends When Orders Considered Unique 16
3.3.7. Entire Order Voids 16
3.3.8. Individual Item Voids 17
3.4. Summary Screen 17
3.4.1. Summary Tile Contents 17
3.5. Other Language Support 18
4. Bump Bar Support 19
4.1. Bumping an Entire Order 19
4.2. Bumping Individual Items (Scroll Mode) 19
4.3. Viewing Off Screen Orders 19
4.4. Recalling Orders 19
4.5. Order Popup Window 21
5. Touchscreen Functionality 22
6. Expeditor Stations 23
7. Customer Facing Stations 24
7.1. Multiple Columns 25
7.2. Optional Timer 25
8. KDS Printing 26
8.1. Single-Station KDS 27
8.2. Multi-Station KDS 27
8.3. Sample Original Chit from Master Printer 27
8.4. Sample Station Order Printout from Master or Station 28
8.5. Station Item Printing 28
8.6. Printer Status 29

8.6.1. Local Printer Status 29
8.6.2. Master Printer Status 29
8.6.3. Both Local and Master Printer Status 29
8.7. Printing from the Recall Order History Window 30
8.8. Printing from Printer attached to Controller 30
8.8.1. Officially Supported Printers 31
8.8.2. Supported Connectivity 31
9. Epson KDS Configuration Software 32
9.1. POS Parser 32
9.2. Devices 32
9.3. Displays 32
9.4. Tiles 33
9.5. Menus and Recipes 33
10. Backup Printer 34
11. Power Interruption 35
12. Feedback from KDS System 36
13. Network for KDS Multi-Screen 37
13.1. Display losing connection to Master 37

1. The Epson Omnilink KDS Solution

The Epson OmniLink printer includes a powerful, retail-hardened PC to drive a Kitchen Display System (KDS) with multiple screens/stations. Epson OmniLink Printers offer an intelligent, reliable, solid-state solution with no fans, hard drives, or moving parts.

KDS systems in general allow for better kitchen workflows. Existing KDS solutions are very complex with functionality that many restaurants do not currently use. The Epson KDS provides an easy to setup, easy-to-use system.

Epson's KDS solution is ideal for customers who want Epson's reliability without the complexities of the competition. For customers who aren't willing to upgrade or change their existing POS application or infrastructure.

1.1. Software Versions

This specification is applicable to:

KDS FW v2.50 and above.
Windows Utility v2.5.0.0 and above.

1.2. System Architecture

- A U220-i, T88V-i, or an L90 Plus-I LFC printer containing KDS software replaces the existing printer in the kitchen. The KD-IB01 controller can also be used.
- 2 Architectures Supported – Single Station (Screen) and Multi-Station
- Expanding from a single station to a multi-station architecture requires adding additional printers or KDS controller boxes for the additional screens.
- In a multi-screen architecture the displays are connected to and driven from their own Omnilink box (KD-IB01) hardware or Omnilink printers if desired.
- Configuration Utility for Windows. Only required for initial setup or subsequent configuration changes.

1.2.1. Single Station Setup

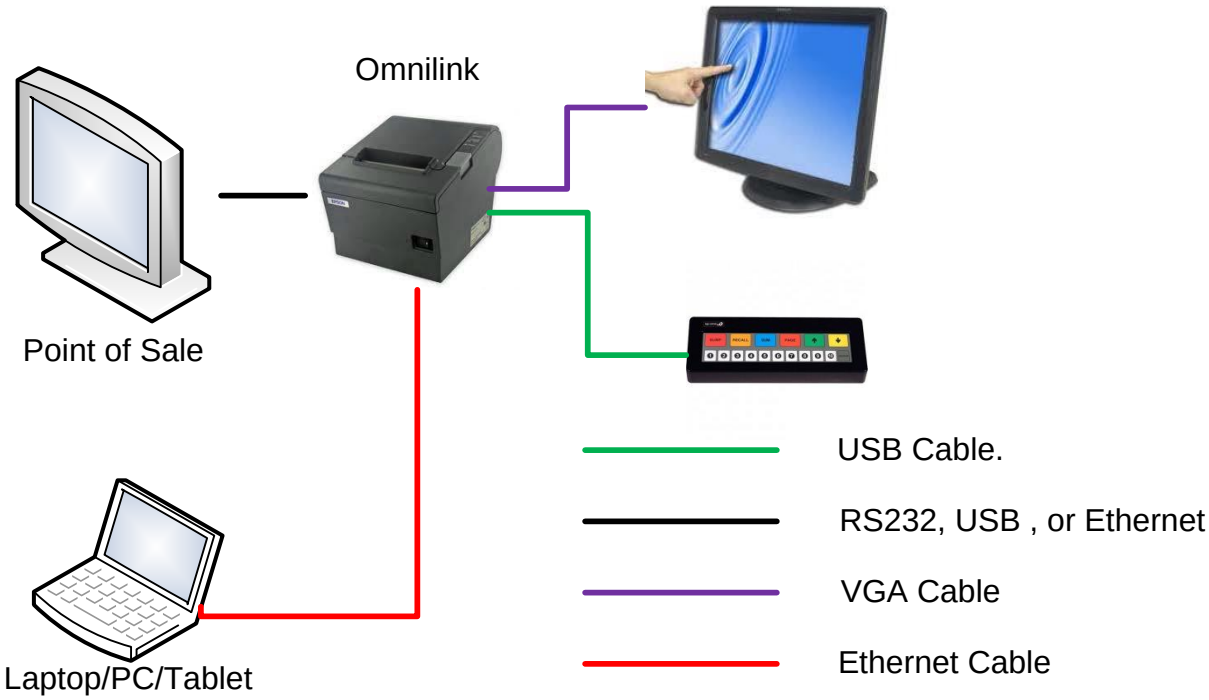

Figure 1.2.1 – Sample Single Station Setup

- Supported Omnilink Printers - U220-i, T88V-i, or L90 Plus-I LFC.
- KD-IB01 controller can also be used where printing functionality is not required:

KD-IB01 Controller

- Display connects directly to the printer/controller.
- Monitor is controlled via the bumpbar or touchscreen can also be used – both connected directly to the printer/controller.
- Configuration from Laptop, PC, or tablet initially or for future changes. Does not need to be present for KDS operation.

1.2.2. Migrating from Single-Station to Multi-Station

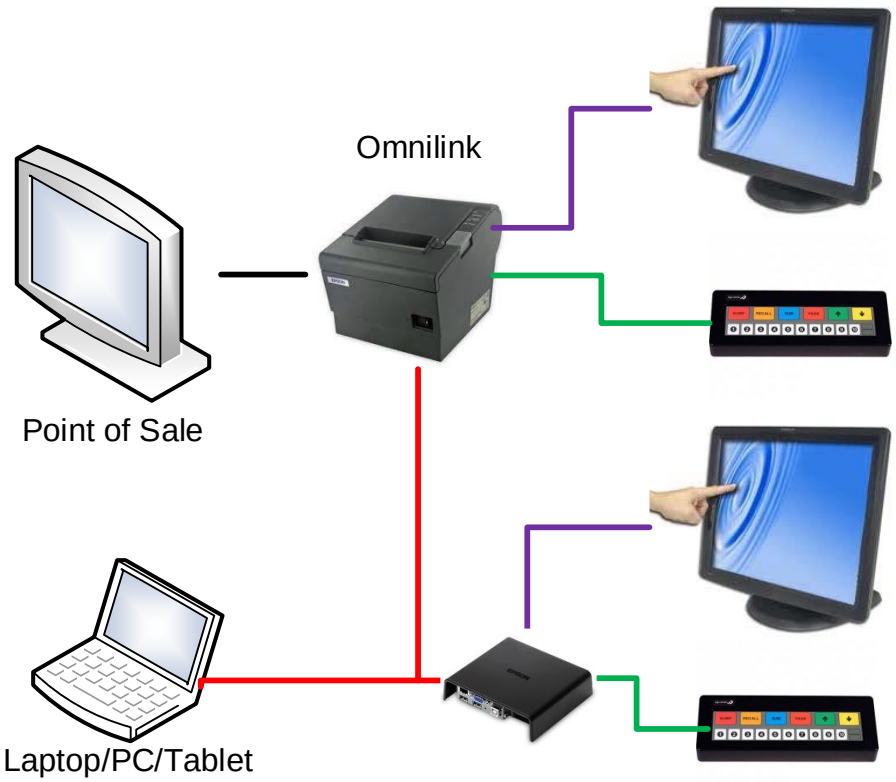

Figure 1.2.2 – Single to Multi-Station Setup

- Existing KDS printer/controller can still be used to drive the original screen.
- Add a KDS Controller or KDS Omnilink printer to drive the second screen.
- KDS Devices communicate to each other over the network/LAN.

1.2.3. Sample Multi Station Setup – KDS Menu Routing

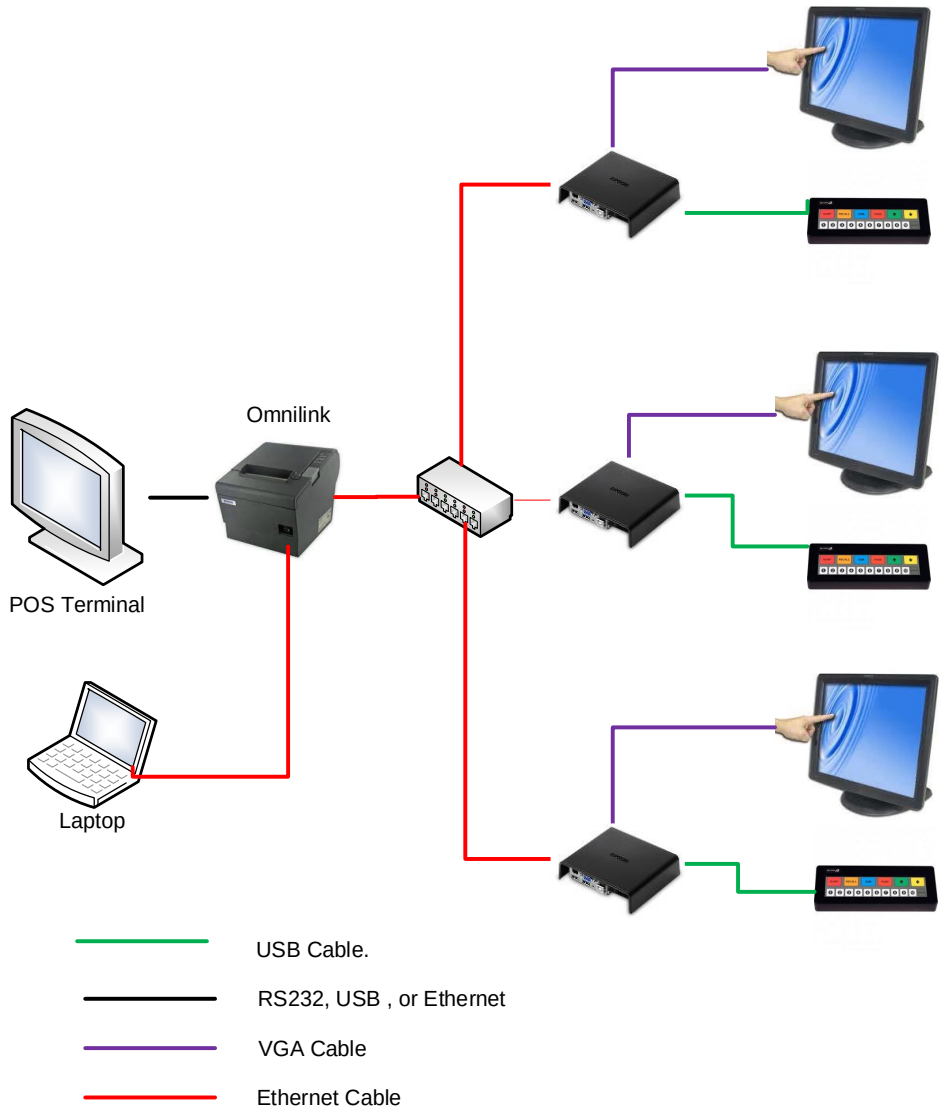

Figure 1.2.3 – Sample Multi Screen Scenario – KDS Menu Routing

- "KDS Menu Routing" - all print jobs are sent directly from the POS to the Omnilink master "POS Attached" printer/controller. The menu configuration and routing determine which screen the orders are sent to.

- The printer(s) and/or expansion boxes are connected to each other over a network/LAN.

- Configuration from Laptop, PC, or tablet initially or for future changes. Does not need to be present for KDS operation.

1.2.4. Sample Multi Station Setup – POS Menu Routing

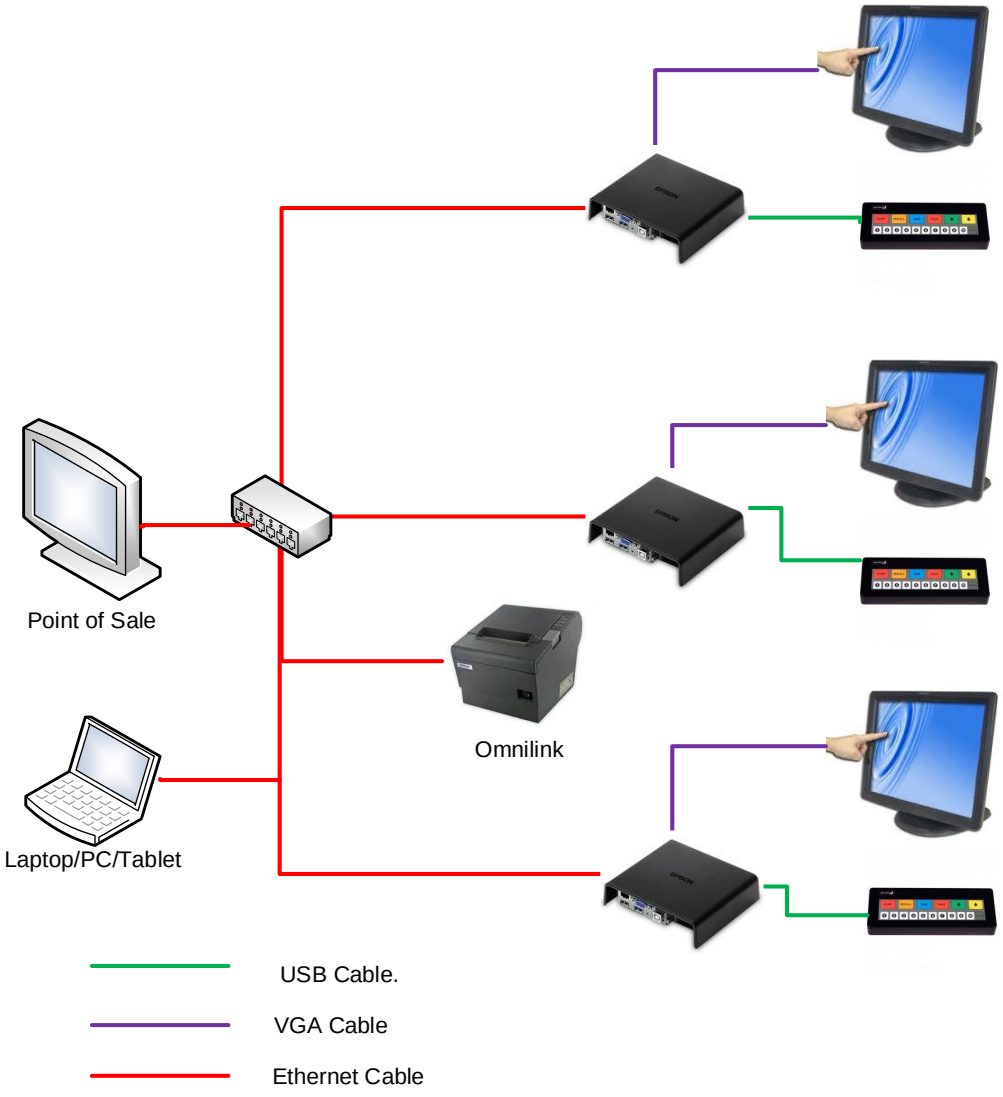

Figure 1.2.4 – Sample Multi Station Setup – POS Menu Routing

- "POS Menu Routing" - all print jobs are sent directly from the POS to their intended display stations over the network. The POS determines which items are sent where.

- The printer(s) and/or expansion boxes are connected to each other over a network/LAN.

- Configuration from Laptop, PC, or tablet initially or for future changes. Does not need to be present for KDS operation.

1.3. Epson Supplied Hardware

- TM-T88V-i, TM-U220-i, or L90 Plus-I LFC Omnilink printer.
- KDS Controller/Expansion Boxes – KD-IB01.
- A supported printer can be used in place of a controller box if station printing is desired.

1.4. Supported Connectivity to POS

- USB, Serial (RS-232), or Ethernet

1.5. Screen Support

- Widescreen Monitors that support 1680x1050 (Widescreen HD) and a VGA interface. Samsung brand of monitors is known to have an issue with this resolution.

1.6. Touchscreen Support

- ELO 1002L Touchscreen – PCAP (Worldwide) – E045337
- ELO 2202L Touchscreen – PCAP (Worldwide) – E351600
- ELO 2702L Touchscreen – PCAP (Worldwide) – E351997
- MicroTouch DT-215P-A1
- MicroTouch SK-215P-A1

1.7. Bump bar Support

- Logic Controls - KB1700U-DK-BK

Logic Controls KB1700 USB bump bar, Legend Sheet D.

- Logic Controls KB9000A-USB

Logic Controls KB9000 USB bump bar, Legend Sheet A

- Other legend sheets for the above bump bars could be supported by reprogramming the keys using Logic Controls software.

1.8. Sound Support

- USB Audio devices are supported.
- KDS Device can be configured to play a sound on order entry into the station.

1.8.1. USB Speakers

- USB Speakers can plug directly into the KDS Printer or controller box

1.8.2. USB Audio Adapter

- USB->3.5mm adapters can be used to drive other speaker systems.

2. KDS Parsers and API

The Epson KDS can accept data from a POS using 2 methods:

1. Using a Parser module. The Epson KDS accepts receipt/chit data the same as if it was sent to a regular printer. The data needs to be ASCII text based data so that it can be parsed and put on screen for display. As each POS system sends their print jobs in different formats, the Epson KDS needs to know which format/POS it is working with. Epson writes modules called parsers for each POS system supported and the current support list is in section 2.1. Please consult the **Epson KDS Parsers User Manual** for more information on supported POS systems and how to get support for unsupported systems.

2. Using the KDS API (Application Programming Interface.) Using this interface the POS can send orders to the KDS and also receive status from the KDS. Development work is required on the host side to implement the API protocol. Please consult the **Epson KDS API User Manual** for more information on the API.

3. KDS Display

The Epson KDS outputs a high-resolution, color, graphic display that can be customized to meet the specific needs of the station:

Figure 3.0 - Sample 5x2 Screen

3.1. Display Header

The blue header at the top shows the number of orders to the left, the screen title (configurable), the average bump time for that screen, and the number of orders to the right.

If more orders are entered than can be displayed on the screen the number on the right will increase indicating more, newer orders are in the queue. The screen can be scrolled to the right to view these orders.

The average bump time is a calculation of the average bump time for orders within the last hour. This is in MM:SS (Minutes:Seconds) format.

3.2. Supported Tile Arrangements

1x4 – 4 tiles,	2x4 – 8 tiles,	3x4 – 12 tiles
1x5 – 5 tiles,	2x5 – 10 tiles,	3x5 – 15 tiles
1x6 – 6 tiles,	2x6 – 12 tiles,	3x6 – 18 tiles
1x7 – 7 tiles,	2x7 – 14 tiles,	3x7 – 21 tiles

(Row x Columns)

3.3. Order Tiles

The tiles for a particular order show the server, table and check numbers, and a running timer for how long the order has been up for, along with all items for the order:

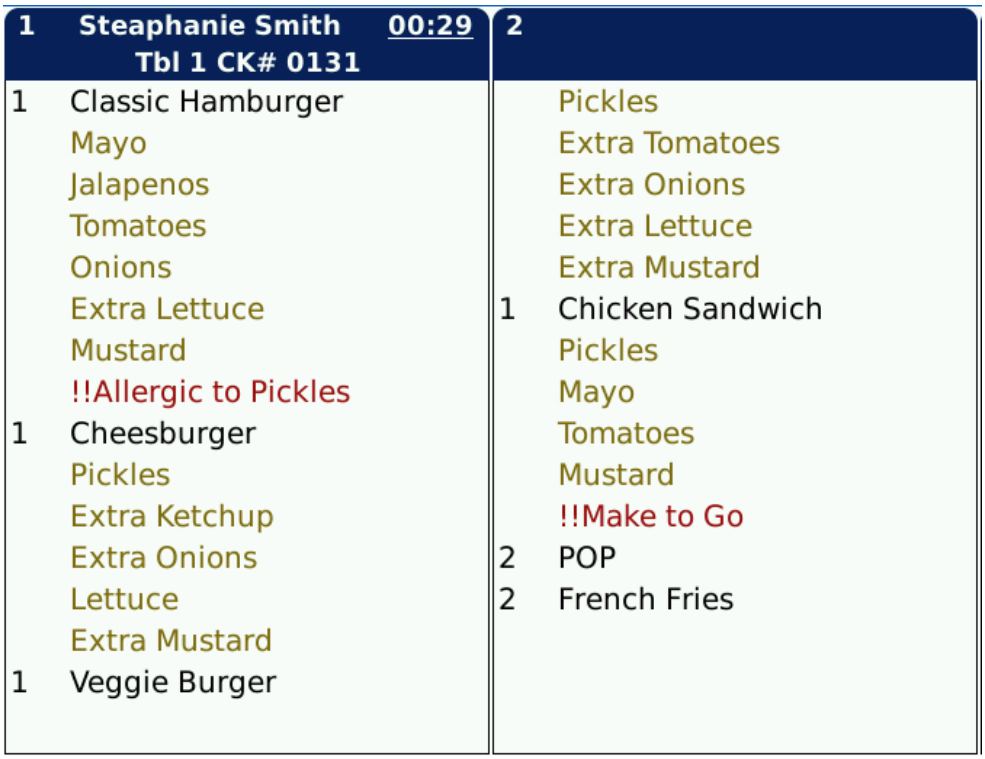

Figure 3.3 – Order spanning 2 tiles

3.3.1. Tile Header Color

The tile header contains the tile number, the server name, a running timer, the table # and the check/order #. When orders appear on the display they are in a default, configurable color. The color can change at two specific time periods configurable in the utility to provide another indicator of when items have been on display for an extended time.

3.3.2. Quantity or Seat

The left column can show the seat # or the item quantity. Which is shown is selectable from the Configuration Utility. For orders that require both, Seat should be selected from the Configuration Utility and the POS parser can be customized to show the quantity in the item description.

3.3.3. Order contents

Items, modifiers, and any special instructions or alerts can be displayed in their desired color which is configurable from the KDS utility. If item descriptions extend beyond the viewable space we will wrap the items to the next line provided there is sufficient spacing between words to cutoff the line.

3.3.4. Order appends

In the KDS Configuration Utility there is an option “Consider Orders Unique”. If unselected, any additions to an order are recognized by matching the order number to an order already on screen. Additions to an order are highlighted so they are easily recognized by the kitchen staff. The following order was sent as 2 separate orders. First the Classic Hamburger was sent. The order was then added to with a Cheeseburger:

Figure 3.3.4 Order Append

3.3.5. Displaying Other Information

Any information that is contained on the ticket can be put on the display. This includes course information, customer information, etc. In some cases the parser may need to be customized or updated to display this information per requirements.

3.3.6. Order Appends When Orders Considered Unique

The feature to Consider Orders Unique allows each addition to an order to show up in its own tile. Additions to an order will have the same order # and with this option set the additional items will not be appended – they will show up in the next available tile.

3.3.7. Entire Order Voids

Orders that are subsequently voided will result in having all of their items/modifiers crossed out and colored in a configurable VOID color. We also color the background of the seat/quantity field and put a V. We do not remove the order from the display as this may interfere with kitchen staff interaction with the KDS.

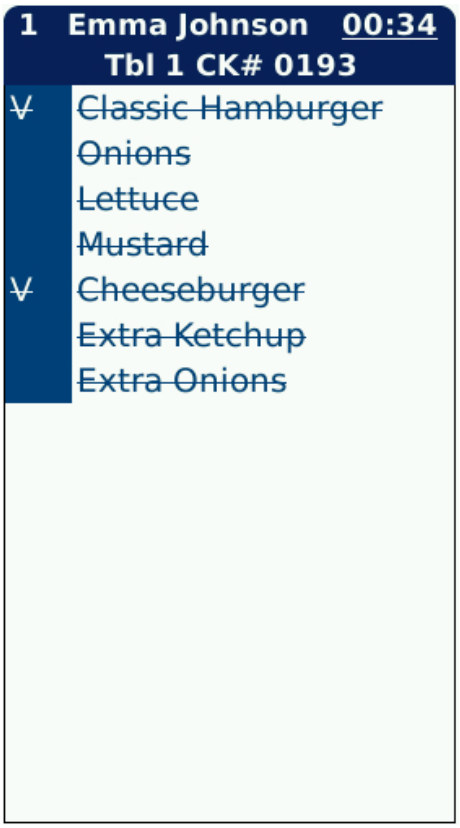

Figure 3.3.7 Order VOID

3.3.8. Individual Item Voids

If any individual items are voided only those items are crossed out and colored in the configurable VOID color.

3.4. Summary Screen

The KDS can be configured to have 1,2, or 3 of the rightmost tiles as a Summary Tile. The Summary Tile tallies the items and/or modifiers on the screen:

Figure 3.4 Summary Tile 1 Tile

3.4.1. Summary Tile Contents

The summary items that are displayed are configurable from within the KDS Configuration Utility.

Both items and modifiers can be tallied.

3.5. Other Language Support

The KDS can display characters corresponding to the ISO-8859-1 (Latin Alphabet 1) character set. Characters in the ASCII range 0xA0->0xFF can be sent directly to the KDS without any special configuration. This allows support for the following languages:

Afrikaans, Albanian, Basque, Breton, Corsican, English, Faroese, Galician, Icelandic, Irish, Indonesian, Italian, Kurdish, Leonese, Luxembourgish, Malay, Manx, Norwegian, Occitan, Portuguese, Rhaeto-Romanic, Scottish Gaelic, Scots, Southern Sami, Spanish, Swahili, Swedish, Tagalog, Walloon

These characters will not print out properly unless the Windows-1252 or CP-1252 (code page) is selected on the printer. CP-1252 is a superset of the ISO-8859-1 (Latin Alphabet 1) character set.

Figure 3.5 Sample Order in Spanish

4. Bump Bar Support

Please consult the User Manual for the KB1700 and KB9000 bump bars for details on bump bar operation. This section highlights the capabilities.

4.1. Bumping an Entire Order

Entire orders can be bumped by selecting the tile number on the bump bar.

4.2. Bumping Individual Items (Scroll Mode)

Individual items can be bumped by entering Scroll mode, selecting the order and item and then bumping it.

4.3. Viewing Off Screen Orders

New orders that are off screen can be viewed by scrolling off screen.

4.4. Recalling Orders

Orders that have been bumped can be viewed in the history window and recalled if necessary. Bumped orders appear in a list – with the last bumped order at the top and highlighted.

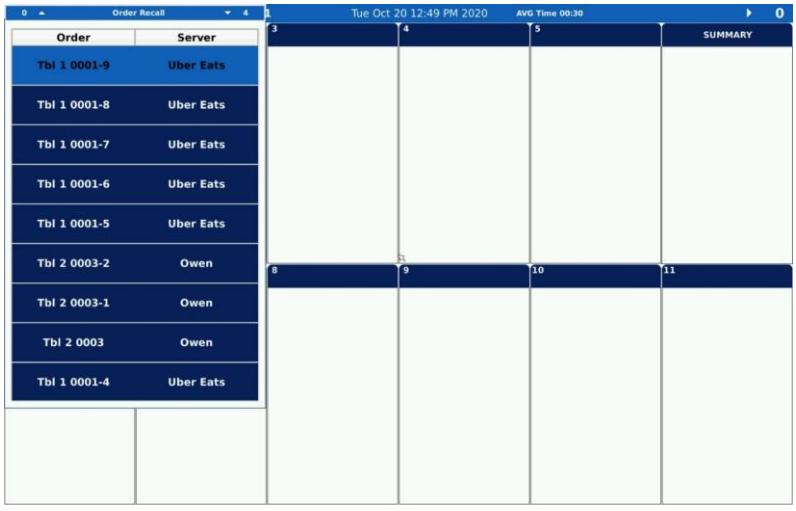

Figure 4.4 – Order History

Recalled orders are identified and highlighted in the order header and placed in the beginning of the queue – tile #1.

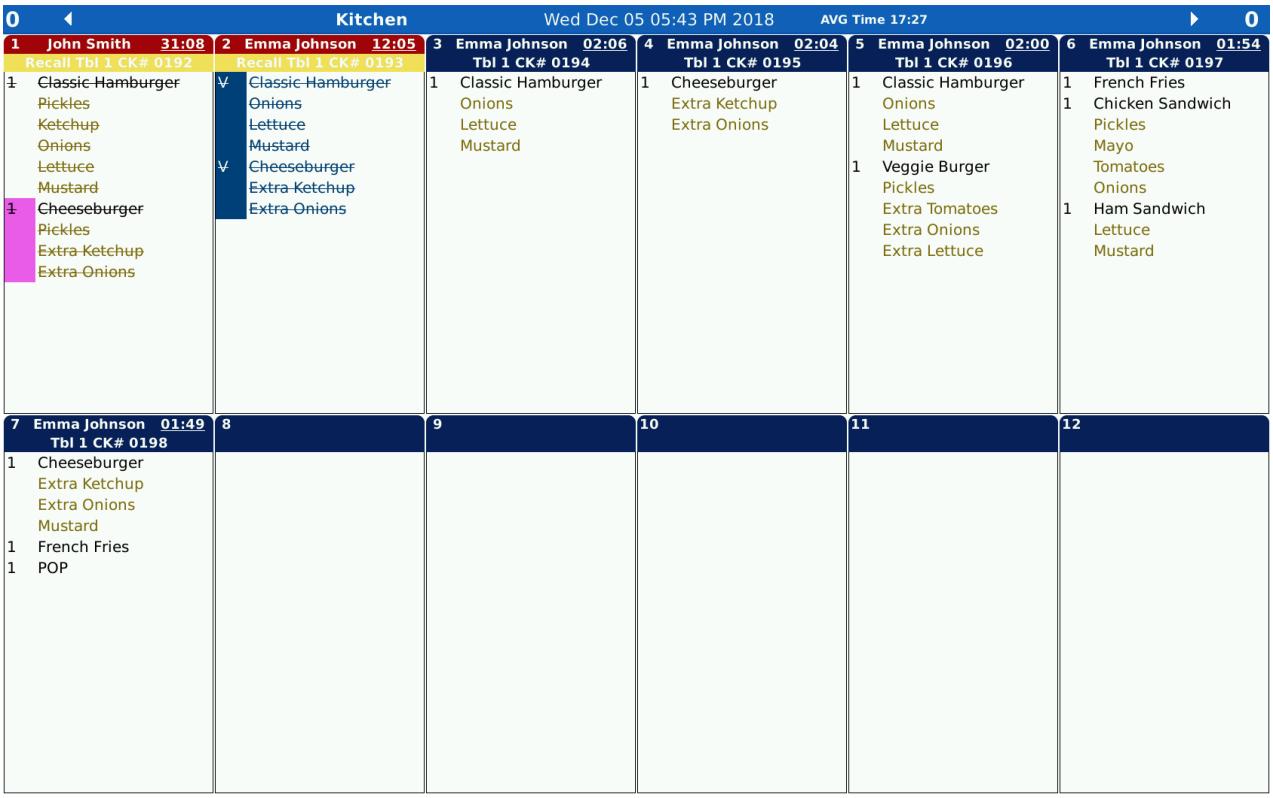

Figure 4.4.1 – Recalled Orders Placed at Front of Queue and Highlighted

4.5. Order Popup Window

An order can be selected to be viewed in its own pop-up window. This is convenient if orders span multiple windows and it's desirable to see the entire order in its own window. Or if an order in the last tile extends off screen.

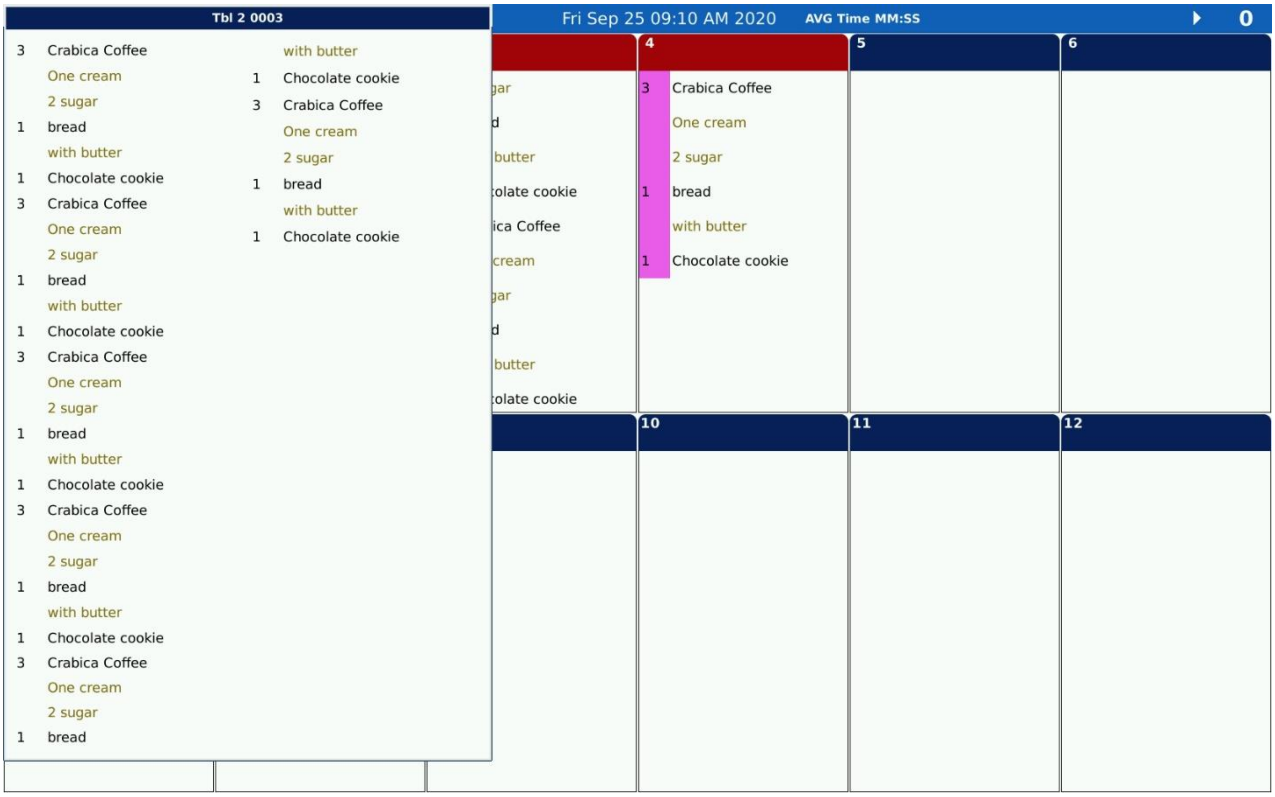

Figure 4.5 – Expanded Order Window

5. Touchscreen Functionality

A touchscreen can be used to operate the KDS in place of a bump bar. Same capabilities exist with both except the Order Popup Window cannot be used on a touchscreen. Please consult the Epson KDS Touchscreen User Manual for more information.

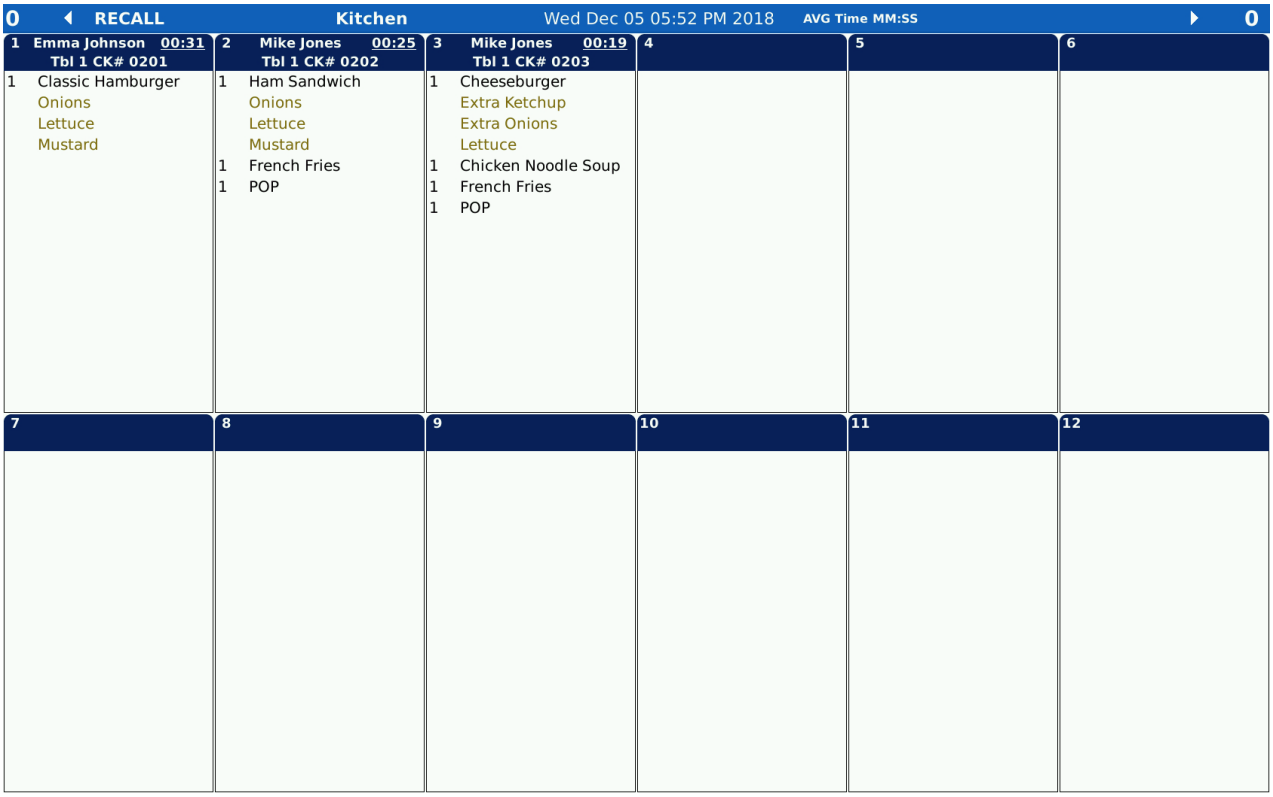

Figure 5.0 – Touchscreen Window

6. Expeditor Stations

One or more screens can be designated as Expeditor (Expo) stations. The Epson KDS generates this screen using all of the order information sent to the other screens. Expeditor stations will not allow an order to be bumped until each item has been bumped off of their respective kitchen stations.

Once an item has been bumped on a station other than the expo, a strikethrough will appear on the menu item at the expo station. When all items have been bumped on the expo order the expo order window will become highlighted and move to the beginning. This indicates it can now be bumped off.

Figure 6.0 – Sample Expeditor Station with 3 Orders Prepared and ready to be bumped

7. Customer Facing Stations

In a multi-station KDS configuration one or more screens can be designated as ‘Customer Facing’ display stations. This display shows two lists: “IN PROGRESS” and “COMPLETE”. When orders enter the KDS system the order # will show up in the IN PROGRESS list and when the order is completely bumped from the KDS prep stations it will move to the COMPLETE list. From there, it can be manually bumped off. Otherwise a timer can be configured to automatically remove orders after a period of time.

If an Expeditor station is configured the order must also be bumped off of the Expeditor station in order for the order to move from IN PROGRESS to COMPLETE.

The font size and number of orders to show in the list is customizable from the Utility.

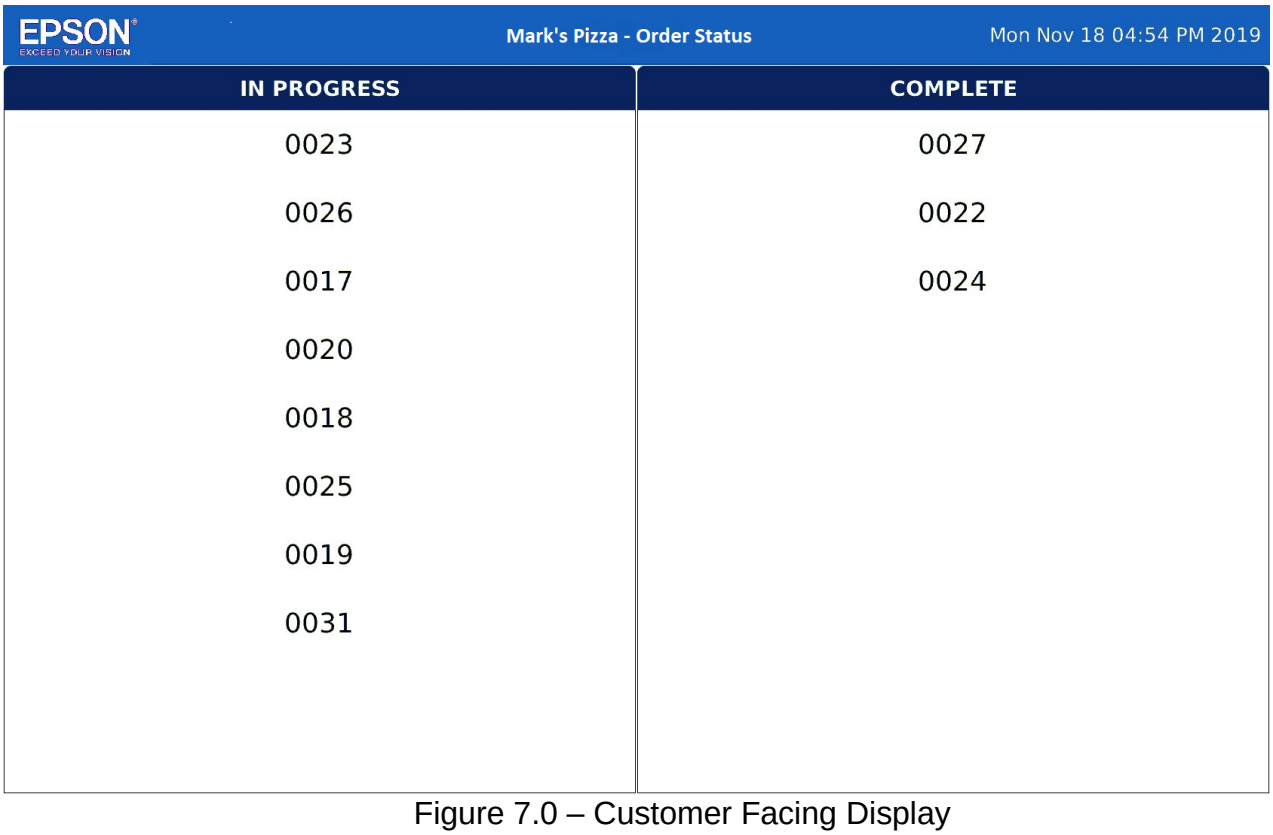

Figure 7.0 – Customer Facing Display

7.1. Multiple Columns

One or two columns can be configured to display.

7.2. Optional Timer

A timer can be configured for each order to show the elapsed time the order is IN PROGRESS.

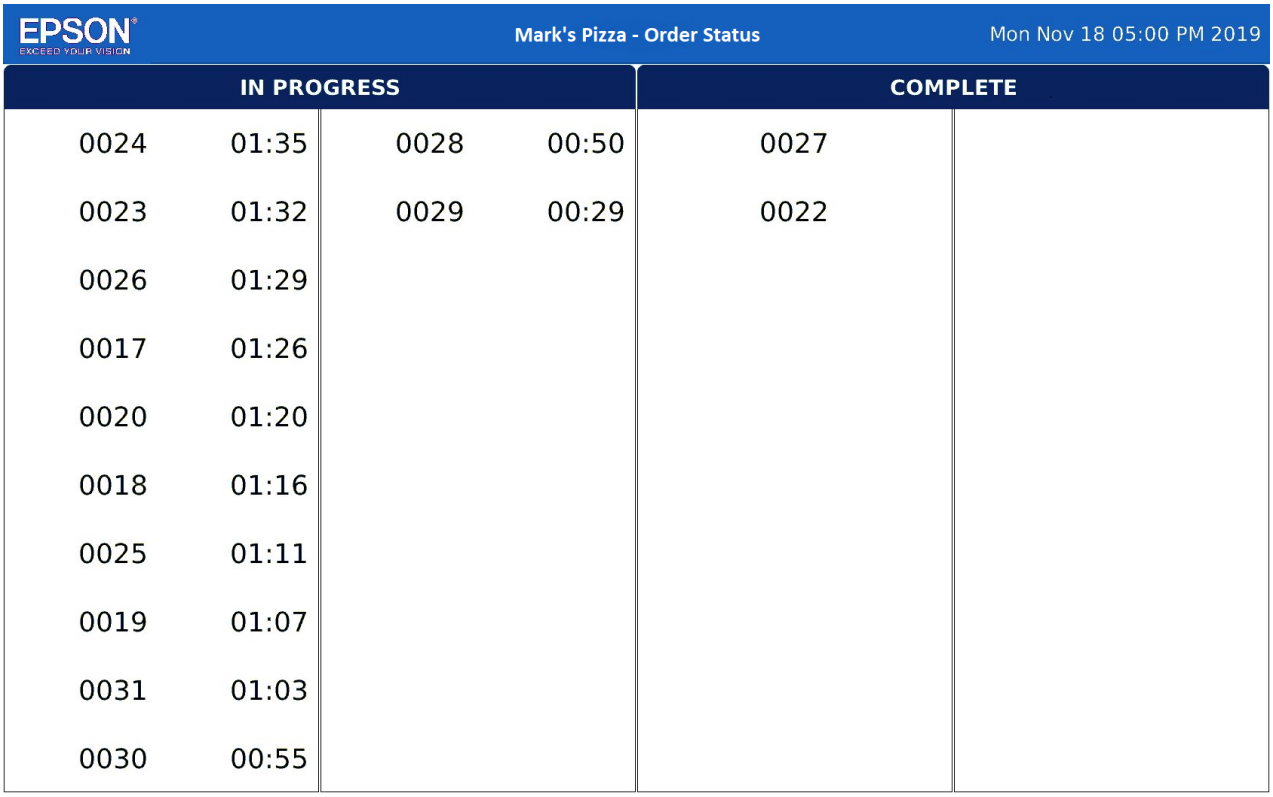

Figure 7.2 – Sample Customer Facing Display showing 2 Columns and timer for IN PROGRESS

8. KDS Printing

Printers can be used to drive displays instead of the KD-IB01 controller box to allow for printing at the stations themselves:

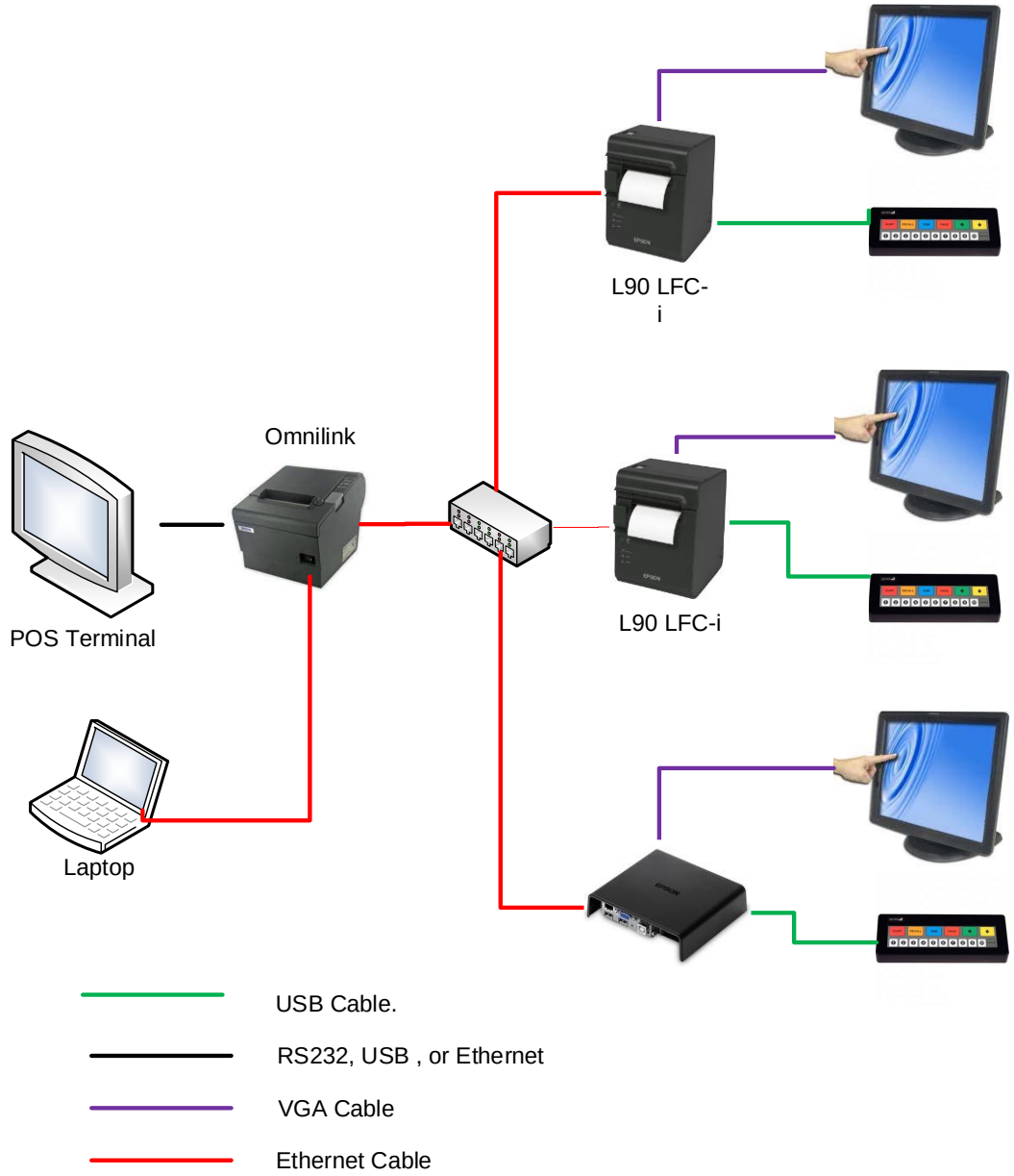

Figure 8.0 – Sample System Architecture with L90 Plus-I LFC at Stations

A combination of printers and KDS Controller boxes can be used to meet the specific requirements for the kitchen.

8.1. Single-Station KDS

- U220-i, T88V-i, or L90 Plus-I LFC can be used as the master printer driving the display.
- Can be configured to print the incoming chits in their unmodified form as sent from the POS.
- Any supported printer can print individual item labels upon item bump.
- Any supported printer can print the entire order upon order bump.

8.2. Multi-Station KDS

- U220-i, T88V-i, or L90 Plus-I LFC can be used as the master printer.
- U220-i, T88V-i, or L90 Plus-I LFC can be used as the station controller driving the display.
- Any supported printer as a station printer can print individual item labels upon item bump.
- Any supported printer as a station printer can print entire order as a label upon order bump.
- Order bump from any station can trigger the entire order to be printed on the master printer.

8.3. Sample Original Chit from Master Printer

```
********************************
          Kitchen Chit
********************************

Register#:                    01
Order#:                     0032
DATE:                  2017/6/30
TIME:                      1:46 PM
SERVER:          Steaphanie Smith
TABLE:                        01


Qty   Description
1     Classic Hamburger
        Onions
        Lettuce
        Mustard
1     Cheesburger
        Extra Ketchup
        Extra Onions
1     Veggie Burger
        Pickles
        Extra Tomatoes
        Extra Onions
        Extra Lettuce
1     Chicken Sandwich
        Pickles
        Mayo
        Tomatoes
```

Figure 8.3 – Kitchen Chit

8.4. Sample Station Order Printout from Master or Station

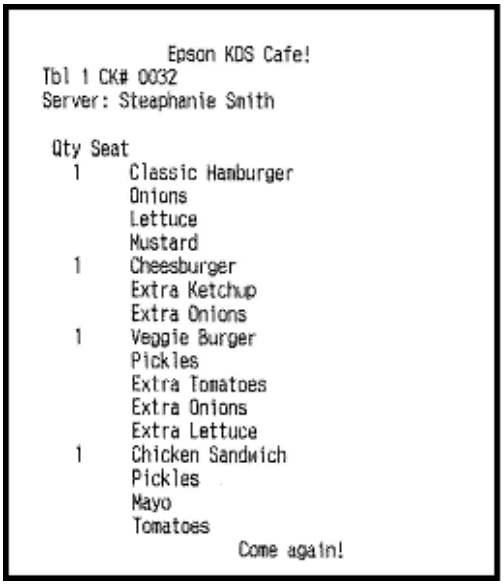

Figure 8.4 – Sample Order Label

8.5. Station Item Printing

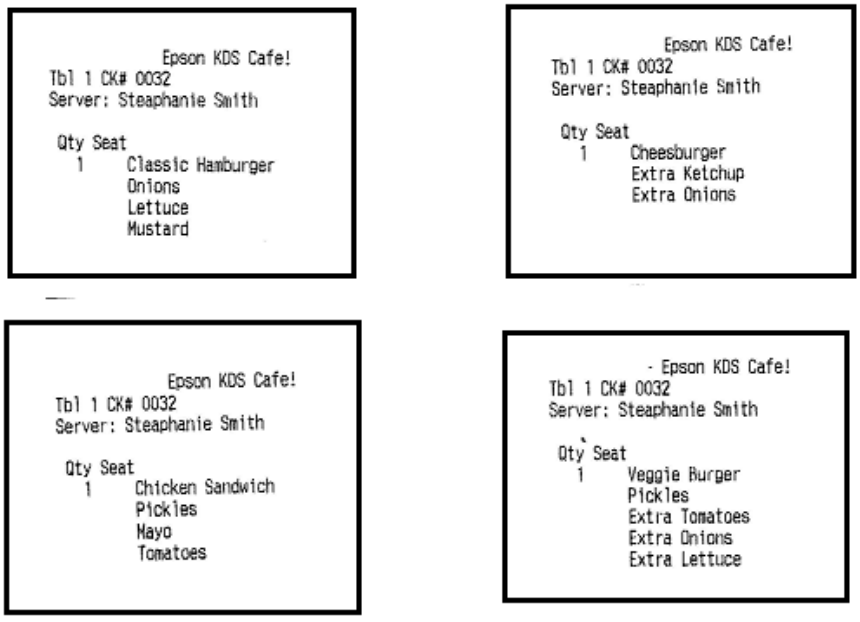

Figure 8.5 – Sample Individual Item Labels

8.6. Printer Status

8.6.1. Local Printer Status

If a station is configured to print and the printer becomes offline for whatever reason (paper out, cover open, etc.) the KDS display will continuously flash a notification in the display header until the printer is online once again.

Figure 8.6.1 – Station Printer Offline

8.6.2. Master Printer Status

If the Master (POS-connected) printer is configured to print when orders are bumped off of the station and the master printer becomes offline the KDS display will continuously flash a notification in the display header until the printer is online once again.

Figure 8.6.2 – Master Printer Offline

8.6.3. Both Local and Master Printer Status

Both the station and the POS-connected printer can be configured to print and if they are both offline:

Figure 8.6.3 – Both Printers Offline

8.7. Printing from the Recall Order History Window

If a printer is offline and the print job does not print when the order is bumped the order can be printed from the Order History window.

8.8. Printing from Printer attached to Controller

An Epson printer can be connected to a KDS Controller for bump-and-print functionality from that controller/station.

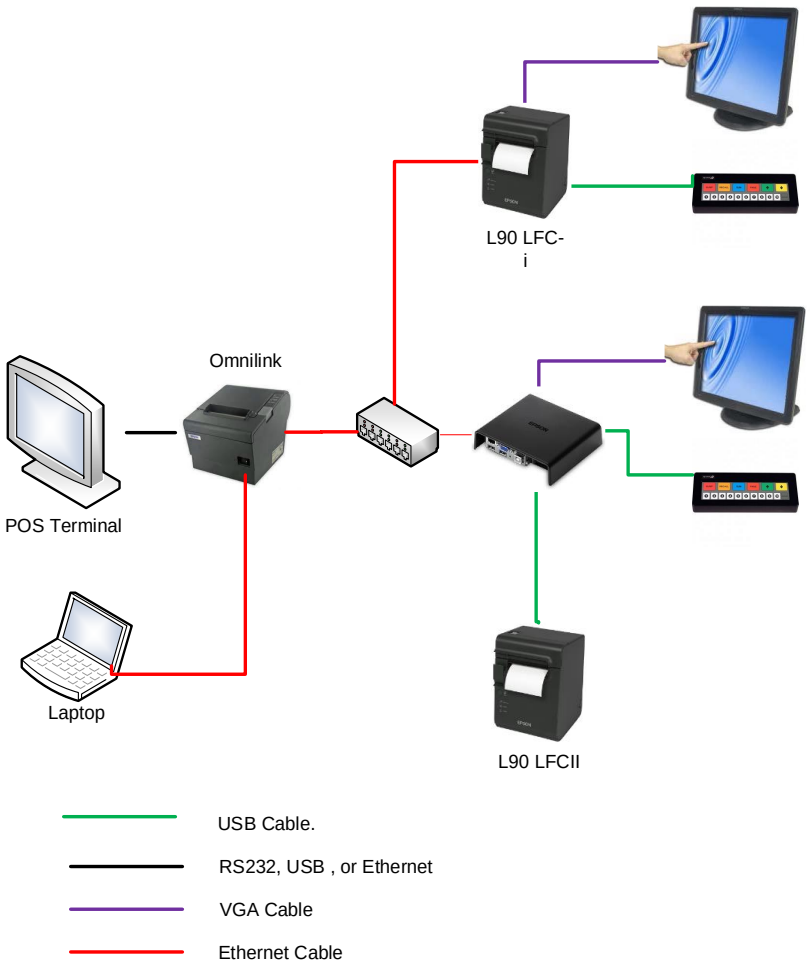

Figure 8.8 – L90 Plus-I LFC Printer connected to KDS Controller

8.8.1. Officially Supported Printers

TM-L90II LFC

While any Epson printer connected via USB (Using Epson Vendor class TMUSB) should work, we specifically support the TM-L90II LFC.

8.8.2. Supported Connectivity

Only USB Connectivity is supported – a standard A-B USB Cable connected between the controller and the printer. Type A connector plugged into the controller. Type B connector plugged into the printer.

9. Epson KDS Configuration Software

KDS is configured using a configuration Utility. This utility is available for Microsoft Windows. The utility needs to be executed from the same network as the KDS system is in order to access it.

A supplementary document describes the Epson KDS Configuration Utility but this section describes some the configurable functionality.

9.1. POS Parser

Each POS requires a parser in order to understand the format and fields of the incoming data. These parsers are bundled with and selectable in the Configuration Utility.

9.2. Devices

The master printer, station printers, and expansion boxes are the KDS system devices. They are all discoverable over the local network and added to the system configuration from the utility. If the device is a printer the following options are available:

- Print Item on Bump
- Print Tile on Bump
- Print Tile on Bump at POS printer

9.3. Displays

Displays are configured and attributed to a device. The following can be configured:

- Display Title
- Tile arrangement
- Expo screen
- Summary Tile
- Summary Tile Items to Display
- Menu Items to Display
- Priority and Rush times
- Customer Facing Display
- Sound on Order Entry

9.4. Tiles

Tiles are configured and attributed to a display. The following can be configured:

- Display QTY or SEAT
- Lines per Tile
- Font Size
- Order Header Color Settings – Normal, Priority, and Rush
- Background color
- Foreground color
- Item color
- Modifier color
- Recall color
- VOID color
- Alert color (allergies, special instructions)
- Appended (order addition) item color
- Expeditor background color
- Item Selection bar color

9.5. Menus and Recipes

If using KDS Menu Routing or a Summary Tile configuration then the menu needs to be entered into the KDS Utility. The items need to be entered exactly as they would be printed out as that is what the KDS is parsing, or the API is sending.

When menu items are entered there is a field where the recipe or any cooking instructions can be entered for the item.

10. Backup Printer

Most kitchens employ a backup printer to be used if the main printer goes down for whatever reason (paper out, spillage, etc.) As the main/master printer is integral to the KDS solution, we advise an ordinary backup printer is available for the same reasons.

This printer does not need to be an Omnilink printer – any standard Epson T88 or U220 printer will do.

If kitchens are upgrading from a U220 printing kitchen chits to an Epson KDS, the U220 can certainly be used as a backup printer and most POS systems should support that.

11. Power Interruption

The current KDS state is always saved, which preserves the display(s) in the event of a power outage.

The recall list is not preserved – only what is currently on the displays themselves.

12. Feedback from KDS System

It is possible to collect information from the KDS system by using callbacks that are registered using the KDS API. Callbacks exist for:

- New order entry.
- Order priority times being reached.
- Orders being bumped.

In the event that callbacks are not desired, the KDS system can be queried for order status.

Please consult the separate documentation on the KDS API for details about how to get notification for various KDS events.

13. Network for KDS Multi-Screen

The multi-screen KDS relies on a fully functional network so that the devices can communicate with each other. The main KDS printer is integral to the entire solution as that is the Master controller.

Please consult the Epson KDS Network Requirements User manual for more information.

13.1. Display losing connection to Master

If the Master KDS printer/controller is powered off or disconnected from the network the KDS will show a message on each display indicating such and prevent them from being used until the master printer is back online:

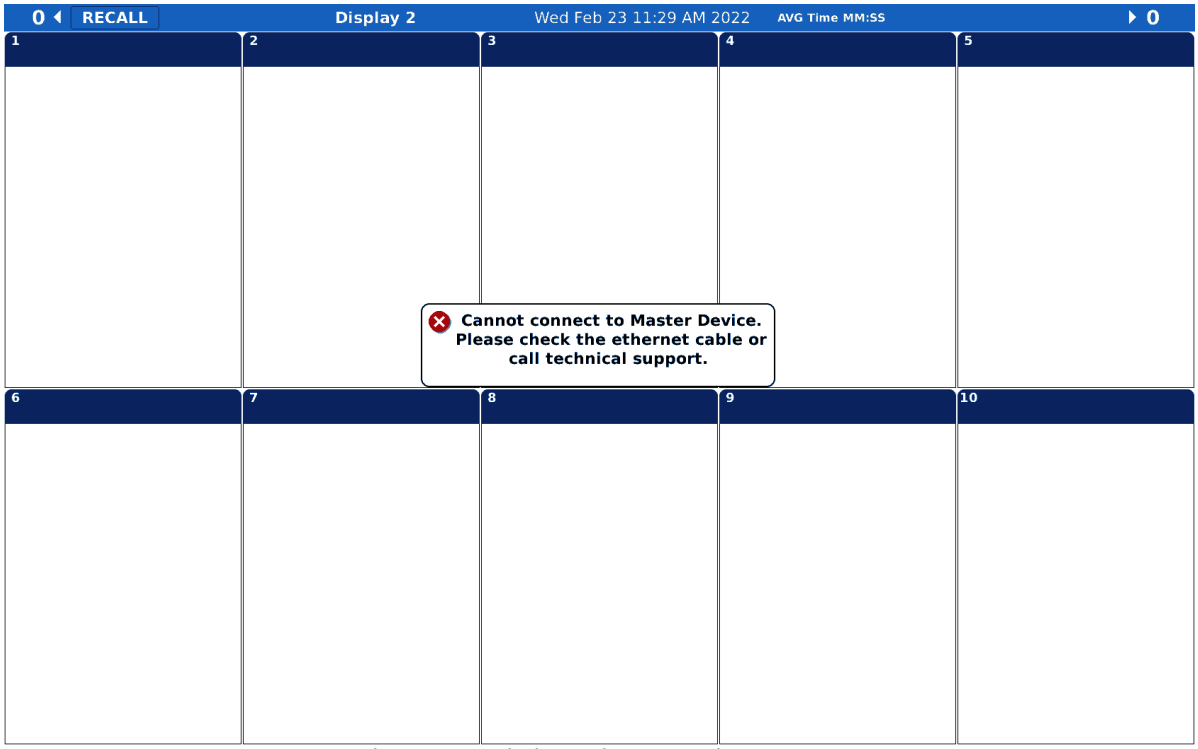

Figure 13.1 – Display Losing Connection to Master