



Service Guide

June 15, 2003
TM-MEDSVC-000G PD 4151

For use when installing
MedSelect® or SupplySource™ Systems

Document History

Document Number	Date	Remarks
TM-MEDSVC-000A	9/1/98	MedSelect System Software Version 4.1
TM-MEDSVC-000A	9/99	UDM Version 640
TM-MEDSVC-000B	7/00	DT-2 System/SST Version
TM-MEDSVC-000C	6/01/2002	Insert MedSelect company name and logos. Update MedSelect Customer Support Center. Drop "Plus" from Supply Source product. Updated Patents, Trademarks and Copyright. Add SST lock component replacements.
TM-MEDSVC-000D	08/23/2002	DT-2.5 (Dell CPU and new ELO LCD) additions.
TM-MEDSVC-000E	12/17/2002	Service parts list additions, correct document p/n.
TM-MEDSVC-000F	4/11/2003	Computer Service Parts update
TM-MEDSVC-000G	6/15/2003	Computer Service Parts update

Copyright protection is claimed for each revision listed in the document history, as of the date indicated.

The following are registered trademarks of MedSelect Inc. and cannot be used without the written permission of MedSelect Inc.:

MedSelect®, MedSelect Systems®, MedSelect SmartStock®, and Selectrac®.

The following are trademarks of MedSelect Inc. and cannot be used without the written permission of MedSelect Inc.:

MedSelect™, MedSelect Systems™, MedSelect Administrative WorkStation (AWS)™, MedSelect Centrack™, MedSelect Display Terminal (DT)™, MedSelect Examiner™, MedSelect Interface Engine™, MedSelect MedOrders™, MedSelect Nursing WorkStation (NWS)™, MedSelect SmartStock™, Selectrac™, SupplySource™, SupplySource Configure-It™, and SupplySource Control Center™.

Other brand and product names are trademarks or registered trademarks of their respective companies.

This document contains proprietary information. If the document pages state the information is confidential (or words of similar import), then this document is intended solely for the use of the copyright owner's employees or other personnel expressly authorized in writing by the copyright owner. Other uses of this information without the express written consent of the copyright owner have not been authorized. This document should be treated as confidential material for security reasons.

The information contained in this document is subject to change without notice. When using the document for system implementation, please call your authorized sales or service representative for any applicable changes.

In no event shall the copyright owner or its suppliers be liable for any special, indirect, or consequential damages of any nature resulting from the use of information in this manual.

No part of this document may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means: electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the copyright owner.

Priced Item

Use of the MedSelect and SupplySource Systems, as well as all aspects of patient care, must still rely upon the professional skill and judgment of a competent medical professional, who should independently verify the accuracy and completeness of all pharmacological, medical, legal, or similar information entered into the system and the results obtained therefrom.

MedSelect products or their operation are covered by one or more of the following US patents: 5404384, 5533079, 5790409, 5848593, 5912818, 5957372, 5961036, 5971593, 5993046, 6019249, 6073834, 6108588, 6112502, 6141942, and 6163737.

Other MedSelect patents pending: 09/014076, 09/086857, 09/288685, 09/384650, 09/428035, 09/428036, 09/578540, 09/848633, 09/849625, 09/921014.

Service Guide Contents

1.	Pre-Servicing Information	9
1.1	Required Precautions When Working In Areas Of Controlled Substances	9
1.1.1	Accountability Of Hospital Inventory	9
1.1.2	Working in Areas Of Narcotic Storage	9
1.2	Level Of Service Covered In This Manual	9
1.2.1	Non-CCA Assemblies And Mechanical Parts	9
1.2.2	Circuit Card Assemblies (CCA).....	9
1.3	Device Acronyms.....	10
1.4	Preparation for System Service	10
1.4.1	Administrator Notification and Inventory Accountability.....	10
1.4.2	Obtaining User Account to Use During Servicing	11
1.4.3	Exiting DT Application with Your Privileged Account	11
1.4.4	Required Tools and Test Equipment	11
1.4.5	General Troubleshooting Process.....	11
1.5	Make-Up of Basic System	12
1.5.1	MedSelect System.....	12
1.5.2	SupplySource System.....	13
1.5.3	Virtual Storage	13
1.5.4	SmartStock	13
1.5.5	Cabinet Security Contact Points.....	13
1.6	System Controller Addresses	14
1.7	Network Addresses.....	15
2.	System Servicing	16
2.1	System-Wide Servicing	16
2.1.1	Cautions And Warnings	16
2.1.1.1	Physical IB Cable.....	17
2.1.1.2	External Shielded IB Cable.....	17
2.1.1.3	Basic Communications	18
2.1.1.4	Data Collision Detection and Storage.....	18
2.1.2	Using <i>IBDiag</i> Diagnostic Tool.....	18
2.1.2.1	Application Features	18
2.1.2.2	Setting Com Port	19
2.1.2.3	Running Scripts	19
2.1.2.4	Finding Nodes	19
2.1.2.5	Application Limitations	19
2.1.2.6	Preparation	19
2.1.2.7	Running Application	20
2.1.2.8	Changing Com Port	21
2.1.2.9	Using Run Script Utility	22
2.1.2.10	Using Find Nodes Command	23
2.1.2.11	Restoring System after Running Diagnostics	24
2.1.3	Advanced <i>IBDiag</i>	24
2.2	System Troubleshooting	25
2.2.1	Checking Fuses and Polyswitches	28
2.2.2	Troubleshooting System Cables And Connectors	29
2.2.2.1	Eight Wire Modular Connector	29
2.2.2.2	Rectangular (Molex® Type) Connector.....	30
2.2.2.3	Insulation Displacement Connector (IDC)	30
2.2.2.4	D-Sub Type Connector.....	31
2.2.2.5	System Cable Diagram.....	31

3.	DT1.5 and Earlier Systems Servicing	35
3.1	Earlier Version DT System Description	35
3.2	DT1.5 System Description.....	37
3.3	DT Components Replacement.....	39
3.3.1	Replacing Ferrite Core Assemblies (Earlier Version Only)	39
3.3.2	Replacing Computer Assembly (Earlier Version Only)	40
3.3.3	Swapping Out Computer Assembly Internal Subassembly (Earlier Version Only).....	40
3.3.4	Replacing DT Power Supply Assembly (Earlier Version Only)	41
3.3.4.1	Power Supply Board Layout.....	41
3.3.4.2	Assembly Replacement Procedure (Earlier Version Only)	42
3.3.5	Replacing Keyboard Assembly.....	42
3.3.6	Replacing Card Readers.....	43
3.3.6.1	Mag-Stripe Card Reader	43
3.3.6.2	Bar Code Reader.....	44
3.3.7	Replacing Motherboard Battery (Earlier Version Only)	44
3.3.8	Replacing Touch Screen Assemblies (General Information).....	45
3.3.9	Replacing Original LCD Screen with MicroTouch® Screen	46
3.3.9.1	Disabling Dynapro Drivers	46
3.3.9.2	Transferring MicroTouch® Drivers from Server to DT	47
3.3.9.3	Installing MicroTouch® Drivers.....	48
3.3.9.4	Calibrating MicroTouch® Screen	48
3.3.10	Replacing MicroTouch® LCD Screen with Original LCD Screen (Dynapro Driven)	49
3.3.10.1	Enabling Dynapro Drivers	49
3.3.10.2	Calibrating Windows 95 Touch Screen (Earlier Version Only).....	50
3.3.11	Replacing Mag-Swipe Card Reader	50
3.3.12	Replacing Bar Code Reader	51
3.4	Testing Card Reader Operation.....	53
3.4.1	Reader Errors	53
3.4.2	Testing Reader	53
3.5	Adjusting DT Power Supply Voltage (Earlier Version Only).....	53
3.6	DT1.5 System and Earlier Version IB Module Troubleshooting	54
4.	DT-2/2.5 System Servicing	55
4.1	DT-2/2.5 Description	55
4.2	DT-UI Components Replacement	58
4.2.1	Replacing Touchscreen Display.....	60
4.2.1.1	Installing Touchscreen Drivers	60
4.2.1.2	Calibrating Touchscreen	60
4.2.2	Replacing Keyboard.....	60
4.2.3	Replacing Touchscreen Torque Hinge Assembly.....	61
4.2.4	Replacing Cable Bundle Assembly.....	61
4.2.5	Replacing Card Reader	62
4.3	DT-2 System IB Module Troubleshooting	62
5.	IB Module and IB Hub Servicing	63
5.1	IBPC Controller CCA Functional Description.....	63
5.2	Daughterboard CCA Description	64
5.3	Case Grounding.....	64
5.4	IB Module and IB Hub Components Replacement	65
5.5	IB Module and IB Hub Troubleshooting.....	65
5.5.1	Diagnosing LED Responses	65
5.5.2	Diagnosing Power Loss	67
5.5.3	Tracing Power Supply Connector Voltages	67
5.6	IB Power Repeater Troubleshooting	68

6.	UDM Servicing.....	69
6.1	UDM Common Servicing Overview.....	69
6.2	UDM Basic Setup	70
6.3	Shelf Configuration and Dispensing Position Numbering	71
6.3.1	Injectable Bin Shelf	71
6.3.1.1	Configuration	71
6.3.1.2	Position Numbering.....	71
6.3.2	Solids/Orals Helix Shelf	72
6.3.2.1	Standard Configurations	72
6.3.2.2	Single Helix, Single Position (SHSP) Configuration	72
6.3.2.3	Single Helix, Double Position (SHDP) Configuration.....	72
6.3.2.4	Double Helix, Double Position (DHDP) Configuration.....	73
6.3.2.5	Position Numbering.....	73
6.3.3	Injectable Helix Shelf	73
6.3.3.1	Standard Configuration.....	73
6.3.3.2	Position Numbering.....	74
6.3.4	Front Door Security Lock and Position Switch.....	74
6.3.5	Lock I/O Requirements.....	74
6.3.6	Common UDM Shelf Configuration Items.....	75
6.3.7	Coiled Cables	75
6.3.8	Internal IB Distribution	75
6.3.9	I/O Controller CCA Functional Description.....	75
6.3.10	I/O Communication.....	75
6.4	General Replacement Procedure Prerequisite	76
6.5	Common UDM Replacements.....	76
6.5.1	Replacing Shelf Assembly (Injectable Bin or Helix).....	77
6.5.2	Replacing Key Lock.....	77
6.5.3	Replacing I/O Controller CCA.....	80
6.5.3.1	Removing UDM Cover (Optional)	80
6.5.3.2	Accessing Controller.....	80
6.5.4	Replacing Coiled Cable	81
6.6	UDM Injectable Dispensing Bin Shelf Servicing.....	82
6.6.1	Injectable Dispensing Bin Description	82
6.6.2	Injectables Dispensing Bin Controller CCA Functional Description.....	82
6.6.3	UDM Version 640 Injectable Dispensing Bin Controller Upgrade.....	83
6.6.3.1	Bin Restock LED.....	84
6.6.3.2	Shelf Restock LED.....	84
6.6.3.3	Diagnostic LED	84
6.6.3.4	On-Board Shelf Position DIP Switches	85
6.6.3.5	Output Configuration DIP Switches	85
6.6.3.6	Relocated Injectable Controller Test Switches	85
6.6.3.7	Replacing Injectable Dispensing Bin Shelf Assembly.....	85
6.6.3.8	Replacing Injectable Dispensing Bin.....	85
6.6.3.9	Replacing Injectable Dispensing Bin Shelf Controller CCA	87
6.6.3.10	Replacing Injectable Dispensing Bin Solenoid.....	88
6.6.3.11	Setting Up and Adjusting Injectable Dispensing Bin	89
6.7	UDM Solids/Orals/Injectables Helix Shelf Servicing	89
6.7.1	Helix Dispensing Shelf Assembly Description	89
6.7.2	Helix Dispensing Controller CCA Functional Description	90
6.7.3	UDM Version 640 Helix Controller Upgrade.....	91
6.7.4	Position Restock LEDs	91
6.7.5	Diagnostic LED.....	92
6.7.6	On-Board Shelf Position DIP Switches	92

6.7.7	Helix Controller CCA Motor And Divider Jumper Sockets	92
6.7.8	Single Helix Double Position (SHDP) Drive (Solids/Orals Only)	93
6.7.9	Double Helix Double Position (DHDP) Drive (Solids/Orals Only).....	93
6.7.10	Motor Reversing (Solids/Orals Only).....	93
6.7.11	Helix Diameter (Solids/Orals Only)	93
6.7.12	Shelf Components Replacement Procedure Prerequisite.....	94
6.7.12.1	Replacing Helix LED CCA	94
6.7.12.2	Replacing Helix Controller CCA.....	94
6.7.12.3	General Helix Replacement Procedures	95
6.7.12.4	Replacing Permanent Divider.....	95
6.7.12.5	Unmounting Drive Motor.....	96
6.7.12.6	Unmounting Index Switch	96
6.7.12.7	Replacing Solids/Orals Dispensing Position Length Guide	96
6.7.12.8	Replacing Helix With Different Helix Capacity (Solids/Orals Only).....	96
6.7.12.9	Releasing Helix from Coupling	97
6.7.12.10	Attaching Helix to Coupling	97
6.7.12.11	Replacing Helix with Different Diameter Size (Solids/Orals Only).....	97
6.7.12.12	Combining Adjacent Helix Dispensing Positions (Solids/Orals Only).....	98
6.7.12.13	Replacing Injectable Helix Dispensing Positions	99
6.8	UDM Troubleshooting.....	99
7.	DM, CDM and MDM Servicing	103
7.1	DM, MDM and CDM Distribution CCA Functional Description.....	103
7.2	DM, MDM and CDM Controller CCA Description.....	104
7.2.1	Open/Close Sensor Reed Switches	105
7.2.2	Controller CCA Setup for Drawer Assemblies	106
7.2.3	Controller CCA Setup for Large Return/Retrieve Drawer Assemblies	106
7.3	Special Notice for DM and SCM California Installations.....	108
7.4	DM Servicing Particulars	108
7.4.1	Sticking Retrieve Drawers	108
7.4.2	Drawer Security Lock	108
7.4.3	DM Replacement Procedures	109
7.4.3.1	Replacing Drawer Assembly.....	109
7.4.3.2	Replacing DM, CDM and MDM Drawer Assembly Key Locks	110
7.4.3.3	Replacing DM, MDM and CDM Top Key Locks	111
7.4.3.4	Replacing DM, MDM and CDM Drawer Assembly Key Locks	113
7.4.3.5	Replacing DM Solenoid.....	114
7.4.3.6	Replacing DM Controller CCA.....	115
7.5	MDM and CDM Servicing Particulars.....	115
7.5.1	MDM/CDM Cable Termination.....	115
7.5.2	Replacing MDM/CDM Drawer Assembly.....	116
7.5.3	Replacing DM or CDM Large Capacity Return/Retrieve Drawers.....	116
7.5.4	Replacing Large Capacity Retrieve Drawer (“G” Size).....	116
7.5.5	Replacing Large Capacity Return Drawer (“F” Size)	117
7.5.6	Replacing DM And CDM Panel	118
7.5.7	Replacing Distribution CCA.....	119
7.6	DM, MDM and CDM Troubleshooting	120
8.	ELC Servicing.....	121
8.1	ELC CCA Functional Description	121
8.2	Setting ELC DIP Switches	122
8.3	Replacing ELC	122
8.4	ELC Troubleshooting.....	123

9.	SCM Servicing	125
9.1	SCM Controller CCA Functional Description	125
9.1.1	Door Security Lock and Position Switch	125
9.1.2	Replacing SCM Solenoid Locking Mechanism, Door Switch, And Key Lock.....	125
9.1.3	SCM Cable Termination.....	128
9.2	Replacing Shelves, Slides and Dividers.....	128
9.3	SCM Troubleshooting	128
10.	ELM Servicing	129
10.1	ELM Functional Description	129
10.2	ELM Troubleshooting	129
11.	SmartStock (Barcode Scanner and IRDA) Servicing	131
11.1	Scanner Troubleshooting	131
11.2	IRDA Troubleshooting	131
11.2.1	Loopback Test	131
12.	Thermal Printer and Remote Power Supply Servicing	133
12.1	Printer Power Supply Specifications	133
12.2	Resolving Paper Jam.....	133
12.2.1	Resolving Paper Reloading Problem	134
13.	System Server Servicing	135
14.	Uninterruptible Power Supply (UPS) Servicing	138
15.	SST Servicing.....	141
15.1	Tower Capacity on the IB	141
15.2	Cabinet Description.....	141
15.3	Cabinet Configuration.....	141
15.4	Shelf Descriptions.....	141
15.5	Position LED Indicators and Pushbuttons	142
15.6	Door Configurations and Security	142
15.7	Cabinet Interior Lighting	143
15.8	Shelf Cable Access Panels	143
15.9	Cabinet Cable Harnesses	143
15.9.1	Shelf IB Distribution Cable Harness (Standard Cabinets Only)	143
15.9.2	Lock Controller Cable Harness	144
15.10	Cabinet Transit and Mounting.....	145
15.11	SST Lock Controller CCA Functional Description	145
15.12	SST Shelf Controller CCA Functional Description	146
15.13	IB Hub CCA Functional Description	147
15.14	IB Power Repeater CCA Functional Description	147
15.15	SST System Components Replacement	148
15.15.1	Replacing DT-UI	151
15.15.2	Replacing DT-CPU.....	151
15.15.3	Replacing IB Hub	152
15.15.4	Replacing UPS.....	152
15.15.5	Replacing IB Power Repeater.....	152
15.15.6	Replacing Lock Controller CCA	153
15.15.7	Replacing Shelf Controller CCA.....	153
15.15.8	Replacing Internal Light Components.....	153
15.15.9	Replacing Door Lock	154
15.15.10	Replacing Door Indicator LED	157
15.15.11	Replacing Door Latch	157

15.15.12	Replacing Door Catch.....	157
15.15.13	Performing Horizontal and Vertical Lock Component Adjustments	157
15.15.14	Changing Door Hinge Side	160
15.16	SST Troubleshooting	160
16.	Parts Lists (6-15-2003).....	163
16.1	MedSelect/SupplySource Parts	163
16.2	DT SUMMARY TABLE.....	180
17.	Support Information.....	183
17.1	Technical Inquiries.....	183
17.2	Technical Inquiries and Support	183
17.3	Requesting Replacement Keys or Locks.....	183
17.4	On-Line MedSelect Documentation.....	183
17.5	Accessing Documentation at Customer's Site	183
17.5.1	Accessing Information from a Display Terminal.....	183
17.5.2	Accessing Information from an AWS Computer	184
17.5.3	Passwords for Documentation Access	184

Figures

Figure 2-1	IBDiag Version 4.0 Startup Menu.....	21
Figure 2-2	IBDiag Version 5.0 Startup Menu.....	21
Figure 2-3	Using Com Port Command To Check Port Setting.....	22
Figure 2-4	Selecting Configuration Script.....	22
Figure 2-5	Entering IB Device Address.....	23
Figure 2-6	Searching Results For IB Connected Devices	23
Figure 2-7	Monitoring Sensor States.....	25
Figure 2-8a	System Cabling Diagram	32
Figure 2-8b	System Cabling Diagram (Continued).....	33
Figure 3-1	Earlier Version DT System Internal Cable Layout And Assembly Identification	36
Figure 3-2	DT1.5 Configuration And Cable Connections.....	38
Figure 3-3	Bar Code Badge Reader Cabling.....	44
Figure 3-4	DT-UI Internal Cabling Arrangement With Mag-Swipe And Bar Code Reader.....	52
Figure 4-1a	DT-2 Configuration And Cable Connections (continued next page)	56
Figure 4-1b	DT-2 Configuration And Cable Connections.....	57
Figure 5-1	Inside of IB Hub	63
Figure 5-2	IBPC Controller CCA Functional Block Diagram	64
Figure 6-1	Dispensing Bin Controller Port Connections For Typical Injectable Bin Configurations	71
Figure 6-2	Dispensing Bin Position Numbering For Typical Injectable Bin Configuration	72
Figure 6-3	Possible Helix Configurations For Solids/Orals.....	73
Figure 6-4	I/O Controller CCA Functional Block Diagram	76
Figure 6-5	UDM Door Lock And Locking Mechanism.....	79
Figure 6-6	Injectable Dispensing Bin Controller CCA Functional Block Diagram (Version 640).....	83
Figure 6-7	Replacing an Injectable Dispensing Bin	87
Figure 6-8	Replacing Injectable Dispensing Bin Solenoid (Version 640)	88
Figure 6-9	Helix Dispensing Controller CCA Functional Block Diagram.....	91
Figure 7-1	DM, MDM, CDM Controller CCA (Version 1.0) Functional Block Diagram	105
Figure 7-2	DM, MDM, CDM Controller CCA (Version 1.5) Functional Block Diagram	105
Figure 7-3	Large Return/Retrieve Drawer Configuration CCA Cable Connections	107
Figure 7-4	Replacing DM Drawer Assembly.....	110
Figure 7-5	DM (CDM and MDM) Door Lock And Locking Mechanism	112
Figure 7-6	Replacing DM Solenoid.....	114
Figure 7-7	Large Capacity Return/Retrieve Drawer Security Flap Springs.....	118

Figure 7-8 Panel Details For Drawer Assembly Positions Large Capacity Return/Retrieve Drawers	119
Figure 8-1 ELC Controller CCA Functional Block Diagram	122
Figure 9-1 Accessing And Replacing SCM Locking Mechanism And Key Lock	127
Figure 12-1 Printer Internal Assemblies.....	135
Figure 15-1 Shelf Lock Controller Cable Harness	144
Figure 15-2 SST Lock Controller CCA Functional Block Diagram	146
Figure 15-3 SST Shelf Controller CCA Functional Block Diagram.....	147
Figure 15-4 IB Power Repeater Functional Block Diagram	148
Figure 15-5a SST Major Components	150
Figure 15-5b SST Major Components (Continued)	151
Figure 15-6 SST Shelf Controller Connector.....	153
Figure 15-7 SST Florescent Light Wiring Diagram.....	154
Figure 15-8 SST Door Lock Replacement	156
Figure 15-9a Door Lock Parts	158
Figure 15-9b Correct Lock Barrel and Latch Clearance.....	159
Figure 15-9c Lock Barrel and Latch Interference	159
Figure 15-9d Keeper and Catch/Switch Alignment	160
Figure 17-1 User And Password Fields	184

Tables

Table 1-1 Controller Address Types.....	15
Table 2-1 Troubleshooting System Using Address Query Results	27
Table 2-2 Analyzing Results Of Software Position Activation	28
Table 2-3 Analyzing Results Of Manual Position Activation	28
Table 2-4 System Fuse Complement	28
Table 2-5 Eight-Wire Modular Connector.....	29
Table 2-6 Six-Pin Rectangular Connector	30
Table 2-7 Six-Pin IDC Connector	30
Table 2-8 Five-Pin IDC Connector.....	30
Table 2-9 Nine Wire D-Sub Connector	31
Table 3-1 Power Supply Connector J1 Pin-Out.....	41
Table 3-2 Power Supply Connector J2 Pin-Out.....	41
Table 3-3 DT1.5 System And Earlier Version IB Module Troubleshooting	54
Table 4-1 DT-UI Major Components	58
Table 4-2 DT-2 IB Module Troubleshooting	62
Table 5-1 IBPC LED Responses.....	65
Table 5-2 Power Supply Connector J1 Pin-Out.....	67
Table 5-3 Power Supply Connector J2 Pin-Out.....	67
Table 6-1 Injectable Helix Shelf Configurations.....	74
Table 6-2 UDM Troubleshooting	100
Table 6-3 UDM Injectable Dispensing Shelf Assembly Troubleshooting	101
Table 6-4 UDM Solids/Orals Dispensing Shelf Assembly Troubleshooting	102
Table 7-1 DM, MDM, And CDM Troubleshooting	120
Table 8-1 ELC Troubleshooting.....	123
Table 15-1 SST Major Components	149
Table 15-2 SST Troubleshooting.....	160

1. Pre-Servicing Information

1.1 Required Precautions When Working In Areas Of Controlled Substances

The MedSelect System is used to store controlled substances (narcotics). Before installing or servicing this equipment, it is absolutely necessary to understand the information that follows in this section.

1.1.1 Accountability Of Hospital Inventory

When servicing a MedSelect System, additions or subtractions from inventory will be recorded by the system, unless the special diagnostic routines are used. If inventory is affected, it must be reconciled by canceling any changes.

1.1.2 Working in Areas Of Narcotic Storage

The MedSelect System may be used for storage of controlled substances. When servicing a system, supervision by a physician, nurse, or other lab personnel is required to remove medications from a controlled inventory-dispensing component.

1.2 Level Of Service Covered In This Manual

This is the second edition of the MedSelect Systems Division service guide. It provides coverage for the MedSelect Automated Medication Tracking and Distribution System (MedSelect System) and SupplySource Automated Medical Supplies Tracking and Distribution System (SupplySource System). The repair/replace policy for these systems is identical and described below.

Note

Since the Centrack System uses MedSelect hardware and interconnections that are common to the MedSelect System and SupplySource System, the Centrack System will not be explicitly covered as a serviceable item.

1.2.1 Non-CCA Assemblies And Mechanical Parts

Defective cables may be repaired at the site. Mechanical assemblies and parts are replaceable if available as a spare parts inventory item only. It is highly recommended to replace cables rather than repair.

1.2.2 Circuit Card Assemblies (CCA)

The level of service for this system is board (i.e., CCA) replacement. CCAs or boards are not repaired. Replaced CCAs must be returned or disposed by established Service practices.

1.3 Device Acronyms

Acronyms are used for each device in the MedSelect System and SupplySource System. Following are the acronyms used in this manual:

- Unit Dose Module (UDM)
- Drawer Module (DM)
- Compact Drawer Module (CDM)
- Mini-Drawer Module (MDM)
- Supply Cabinet Module (SCM)
- Electronic Lock Controller (ELC)
- External Lock Module (ELM)
- SupplySource Tower (SST)
- Uninterruptible Power Supply (UPS)
- Display Terminal (DT)*
- Display Terminal Central Processing Unit or PC (DT-CPU)
- Display Terminal User Interface (DT-UI)*
- Inventory Bus (IB)
- Circuit Card Assembly (CCA)
- Centrack Display Terminal (CT)

*The DT is a system of components consisting of the DT-UI, DT-CPU, IB hub, UPS, and interconnecting cabling. This system can also include optional equipment such as a printer, scanner, IrDa, etc.

1.4 Preparation for System Service

Before servicing a system, notify the lab administrator that the DT and/or dispensing cabinets may be unavailable. The DT's IBDiag application cannot be used while the DT application is running.

1.4.1 Administrator Notification and Inventory Accountability

If the DT IBDiag application is not used to test any part of the system; supply dispensing and additions or subtractions from inventory will be recorded by the system. The system administrator must reconcile these changes in inventory. MedSelect recommends that a test patient be created using your name to isolate test inventory from the original database (see *AWS User's Guide*). After testing, a system administrator can return or restock any items that were dispensed and delete the test patient record, or close it so that it can no longer be used.

1.4.2 Obtaining User Account to Use During Servicing

When arriving on-site for servicing, the system administrator must provide a user account that identifies you to the system, and that allows access to the DT and Administrator's Workstation (AWS) or Control Center computer. Ask the system administrator to create a user account, or to give you access to an AWS so that you may create one yourself. Make certain that your user account has been given maintenance access rights so that you may exit the DT application if required for a service procedure.

If it is needed to access the system server, then a separate valid account on that machine is also needed. The system administrator must provide this account or inform you of the root password for logging in as a supervisor.

1.4.3 Exiting DT Application with Your Privileged Account

Some of the service instructions will require the DT software application to be closed down. To do this, it is necessary log on as a user with maintenance access rights and then press the special **Exit** button that is only available to privileged users. After logging on, a button on the far right of the screen will appear. If a user does not have maintenance rights, then the Exit button will not appear.

If the system is being serviced because of a problem with the DT, then it may be necessary to power off the computer without logging in, such as if the keyboard is locked up. Do this as a last resort, only.

1.4.4 Required Tools and Test Equipment

The same tools used for installation should be on hand for servicing and replacement. A multi-meter is required for voltage and continuity measurements.

Note

A torque wrench capable of indicating 40 to 50 in-lb is required for installing the cam nut on the key lock of the Unit Dose Module, Supply Cabinet Module, and External Lock Module cabinets. This torque setting is critical.

1.4.5 General Troubleshooting Process

Troubleshooting procedures are to be used when trying to determine why a DT, dispensing module, or specific dispensing position is malfunctioning. The test procedure begins at a system-wide level, and by process of elimination, it rules out potential problems until a specific problem is found. This process is as follows:

Process	Described in Section
1. Use the DT's IBDiag application to check for responses from all dispensing devices.	2.1.2
2. Check fuses and polyswitches.	2.2.1
3. Check cables and connections.	2.2.2
4. Check a particular module and verify a bad CCA or hardware mechanism.	Start with the DT as the initial check.

1.5 Make-Up of Basic System

The components that make up these systems are also designed to be modular for ease in servicing and replacement. This manual covers all individual components that are serviceable.

1.5.1 MedSelect System

The MedSelect System includes all automatic dispensing devices and electronic locks. The system is designed to be used in a hospital pharmacy, nursing station, emergency room, operating room, or wherever pharmacy drug inventory is required and must be secured. The following are components of this system as of the publishing date of this manual.

Patient, supply, and user data is entered into the MedSelect System at the AWS, a personal computer running MedSelect custom software. The DT is used to dispense medications and other supplies; to enter, update, and track quantity information; and to retrieve information about patients, supplies, etc. Information is stored by the Oracle database running on the server and is retrieved by the Administrator's Workstation(s) and Display Terminal(s). The MedSelect System includes interface software on the server that provides an interface to other on-site information systems.

The IB module or IB hub is a local device that is used to interface the IB RS485 bus protocol to the RS232 bus of the DT. This module also provides the 24 VDC bus supply for the IB. The IB module or IB hub is powered from a local 115 VAC source, independent of the DT.

The MedSelect System dispensing components are free standing (but secured in place) and can be placed almost anywhere. Each customer will have a different combination of modules depending on the specific inventory needs of the site. The DT is designed to be either suspended from an arm or secured to a flat vertical surface (such as a wall or cabinet side panel).

1.5.2 SupplySource System

The SupplySource consists of standard MedSelect System devices (DT, card reader, etc.) plus a large 16-shelf position, tower-type cabinet that can accept electronically accountable and inventoried shelves. Non-electronic storage shelves (Economy model) are also available. The cabinet has four doors that are electronically lockable. The system is managed by a standard DT-2 System. Refer to the *SupplySource DT Dispensing Guide* and *Installation Guide* for additional details on this system. This system is a complete system of software and hardware and is designed to function independently of a MedSelect System. (If a site has both MedSelect and SupplySource Systems, they will share a server.)

1.5.3 Virtual Storage

Virtual storage is used to create areas where supplies are stored and tracked without the use of MedSelect cabinets or modules. Virtual storage is also used whenever supplies do not fit into any MedSelect device, or when a user needs to track supplies in a stock room or storage closet. The MedSelect System can be configured to recognize any number of areas, and any number of shelves or compartments within each area. In this way, a virtual storage area imitates a DM. The area is similar to the cabinet, the shelves are similar to the drawers, and the shelf compartments are similar to the drawer compartments.

1.5.4 SmartStock

SmartStock is the process in which inventory is tracked by using barcodes and a barcode (sometimes called a laser) scanner. An IRDA transceiver is installed at all SmartStock DTs. It is an optional add-on to the MedSelect System.

1.5.5 Cabinet Security Contact Points

Security contact points can be added to MedSelect dispensing modules for use by an externally connected security system to monitor its open door, open-drawer, or electronic lock status. All necessary hardware is provided in a series of kits (see *Security Contact Points Installation Guide*). The following modules are presently covered: UDM, SCM, DM, CDM, MDM, and ELM.

A terminal board is added internally in each module as the connection point between the external security system and internal module alarm contacts. The same terminal board is used throughout all modifications, except for the ELM modification. The ELM has a special style of terminal board to fit compactly inside the ELM assembly without interfering with any moving lock mechanisms. All terminal boards allow for a resistor connection for those security systems that require current sensing.

Double-backed adhesive tape is used to mount a terminal board in all installations except for one UDM version (00-101640-000A). This

UDM has two factory-installed standoffs for mounting the terminal board. The kit modification covers both versions of the UDM (00-101463-000A and 00-101640-000A).

Note

The two UDM versions can be distinguished from each other by the door switch. The door switch in version 00-101463-000A is a rocker type switch with an actuating lever. UDM version 00-101640-000A uses a plunger type door switch. The UDM versions can also be distinguished by their part number. This part number can be found on the serial number label on the inside door panel.

The UDM uses a 3-wire cable for SPDT contacts. One end connects to the door switch, and the other end connects to the supplied terminal board. In UDM 00-101463-000A, a second kit supplied switch is stacked onto the UDM existing door switch. The plunger switch for UDM version 00-101640-000A is used as it exists and is not supplied in the kit. The existing plunger switch already has an extra pole for use as a security contact. In this case, only a cable is added to the spare contacts of the switch.

1.6 System Controller Addresses

The controller chip on each controller CCA is labeled with a unique 8-digit *controller* address (*AD/SN* address). This address is assigned by the chip manufacturer and is unique among all manufactured chips. The address is used by the system to uniquely identify the controller for communication purposes. Therefore, if a controller chip is replaced, its new address must be swapped with the old one at the Administrative Workstation (AWS). Also, all circuit card assemblies (boards designated CCAs in this text) are clearly identified on the CCA component side by name, revision, top assembly part number, and schematic diagram number.

A listing of controller addresses for devices in the system (as of publication date of this manual) is provided in Table 1-1. The first two digits of the controller address indicate which MedSelect System component is associated with the controller.

Table 1-1 Controller Address Types

Controller Address	Controller Type
06xxxxxx*	DM/MDM earlier than Version 1.5
0Axxxxxx	DM/MDM Version 1.5
07xxxxxx	UDM - Injectable Bin Dispenser
08xxxxxx	UDM - Solid and Injectable Helix
09xxxxxx	UDM - I/O Controller
0Axxxxxx	DM/CDM/MDM
0Bxxxxxx	ELC (controls all SCMs and ELMs)
0Cxxxxxx	SST Lock Controller
0Dxxxxxx	SST Shelf Controller
* Address for Version 1.0. Version 1.5 modules use 0Axxxxxx.	

Because each controller address is unique, the address must be changed in the database any time a controller is replaced.

1.7 Network Addresses

All computers on the LAN (such as the Administrative Workstation, DT(s), Server, and any other hospital computers) are identified by a unique *network* address. The network address consists of the IP address and host name.

2. System Servicing

2.1 System-Wide Servicing

System-wide servicing assumes that the local DTs are operating normally. If it is suspected that a DT is causing a problem, see its particular **Troubleshooting** paragraph.

There are three versions of the DT system. One is an earlier system version where the DT contains a CPU identified as the computer assembly (or brick). The later system version is identified as DT1.5 and consists of the earlier version DT case, but without an internal CPU. This CPU is replaced with an external personal computer, which is mounted inside a secured sheet metal case (called computer mount). The CPU is identified as the DT-CPU. The latest version is the DT-2 System. This version is similar to the previous DT1.5 System, but now has a redesigned DT-UI and cabling interface to the DT-CPU. The mounting configurations for this DT-UI has also been expanded and simplified in this latest version. The SupplySource System and Centrack System are only compatible with the DT-2 system.

This servicing covers the following MedSelect System:

- DT1.5 System and its previous DT System version
- DT-2 System (now called the MedSelect System)
- SupplySource System
- Centrack System

2.1.1 Cautions And Warnings



The IB module or IB hub must be powered off when disconnecting the IB. Otherwise, damage to CCA circuitry can result. Likewise, do not “hot plug” a module into the IB as CCA circuitry damage could result. Always unplug the IB module or IB hub before connecting or disconnecting a module to the IB.



When performing any maintenance on this system, it is undesirable to affect the system database by inadvertent additions or deletions of inventory. In certain situations, even a DT that is off-line can

cause inventory changes in the system database when it comes back on-line. This is a result of memory retention by the individual controller CCAs of off-line inventory changes (i.e., testing of register, etc.). It is, therefore, recommended that the entire IB be reset by momentarily disconnecting the IB module power cord or by turning off the IB hub before returning the DT to its on-line status. This action will clear the memory of all devices on the IB.



Electrostatic-sensitive devices: Use proper CMOS/MOSFET handling precautions to avoid electrostatic discharge when handling all circuit boards. Grounded wrist straps must be worn and proper ESD safety precautions observed when handling the electrostatic-sensitive circuit boards.

2.1.1.1 Physical IB Cable

In this system, the physical IB cable is provided as a shielded cable and as a modular type cable (flat cable). The shielded cable is used for external cabinet or module runs. This shielded cable type is always used for runs external to the cabinets; it can withstand more physical abuse than the flat modular type cable. Also, its shielding allows runs in a noisy (EMI) environment. The modular flat cable is always used for internal cabinet runs. This cable is not shielded.

2.1.1.2 External Shielded IB Cable

Depending on the site requirements, the external IB cable from the IB module or IB hub is supplied with a 9-pin D-Sub connector on one end and crimped connector pins on the other end. The pin end is shipped in heat shrink tubing. This cable can be ordered in a 15- or 50-foot length. The IB cable connections between modules are available with rectangular connectors already installed on both ends of the cable or with one connector only, and the other end terminated in crimped connector pins (bundled in heat shrink tubing). A cable with pin termination's on one end should only be used when the cable must be pulled through conduit. A loose connector is always included with cables ordered with pin terminations.

2.1.1.3 Basic Communications

Typically, dispense communications are initiated by the DT. The DT, however, can initiate a communication with any IB device at any time. In particular on power up, the DT checks that all controllers identified on the master list in the Database Server are present (i.e., capable of communicating on the IB). After the presence of all controllers is confirmed by acknowledgments, the system is ready for normal communication over the IB (i.e., report of dispense commands). The confirmation check, however, does not end after power up. After about five seconds of no activity on the IB, the presence of each controller is again confirmed by the DT. A non-responding controller does not shut down the system; it is logged as a failed device by the system after 16 tries (including the initial try).

2.1.1.4 Data Collision Detection and Storage

It is possible that several controllers will try to communicate with the DT at the same time. When this occurs, data from more than one controller will be simultaneously present on the IB. Each controller, however, can detect when a collision has occurred since it also reads back from the IB as it sends data out onto the IB. If the data read back is different than the data sent out, a collision has occurred and transmission is stopped. The controller will re-transmit at a later arbitrary time. Each controller has enough on-board memory to accumulate up to 255 events while waiting to transmit.

2.1.2 Using *IBDiag* Diagnostic Tool

The IBDiag application is a maintenance software tool that can be run from any DT. It is intended for use only by trained service personnel to initiate dispense commands to the dispensing modules.

There are two versions of IBDiag, Version 4 and Version 5. These instructions will cover Version 4, with any differences for Version 5 noted.

2.1.2.1 Application Features

IBDiag is used to activate any dispensing module associated with the local DT. It also provides a means to search for connected IB devices such as DMs and UDMs. The address of a detected IB device is listed on the screen during the search. Where inputs that are associated with sensor outputs (door switches, drawer position reed switches, etc.) are present, the actual output is dynamically monitored. These monitored values or states are also displayed on a screen. This feature is described under Advanced IBDiag.

For ease of use, scripts are built into the application that can simulate dispense commands for all different controllers.

To save time, all scripts provide a continuous feature that allows re-activating of a script without repeatedly typing in the controller addresses.

2.1.2.2 Setting Com Port

During setup, it may be necessary to set the COM port. The default COM port is COM1. If this port happens to be in use, select another port. The RS232 cable must be connected to the port in use. Unless the MedSelect System that is being serviced uses an exceptional configuration, COM1 should be the port connected to the RS232 cable.

2.1.2.3 Running Scripts

IBDiag provides several scripts, one for each type of dispensing module, that allow the user to select the type of controller, choose an address, and activate every solenoid or position on the controller.

2.1.2.4 Finding Nodes

IBDiag can be used to find all of the system addresses for devices that are connected to the IB. These are referred to as nodes. When the Find Nodes utility is run, the program immediately begins to search for on-line devices. The program scans for controllers, which in turn respond by reporting their addresses. The utility does not indicate the locations of detected controllers, only the existence of the controller on the IB.

2.1.2.5 Application Limitations

When running scripts, the application prompts the user for the controller addresses in a cabinet. IBDiag will not check the user's input to make sure that addresses are not duplicated.

For example, if a DM script is run, the program expects five different controller addresses. If the same valid address for a controller in the configuration is entered five times (instead of entering the unique address for each of the five controllers in the cabinet), then only the controller with that address is activated, and the activation is repeated five times.

If the application generates an application error, it may be necessary to exit Windows and reboot in order to recover from the error.

2.1.2.6 Preparation

It is necessary to exit the DT application to run the IBDiag application. The IBDiag application **will not** run simultaneously with the DT application. Proceed as follows:

1. Exit the DT application as described under **Exiting DT Application with Your Privileged Account** on page 11. If you are at a Centrack PC, exit Centrack.
2. If any other applications are running (for example, the on-line help), then close them before continuing.

3. Power cycle an IB module by unplugging it from the electrical outlet waiting 10 seconds, then plugging it back in to the outlet; or for the DT-2 System, by momentarily (10 second wait) turning off the IB hub.

Note

After completing the diagnostics, power cycle the IB module or IB hub, then reboot the DT. This will guarantee that no miscellaneous events are written to the database. Also after a power cycle, dispensing devices may take a few minutes to come back on line.

The IBDiag application can now be used. **While using the IBDiag application, the database remains unaffected by the local inventory change.**

Note

When servicing a system, be sure to consult a lab administrator to determine whether supervision by a physician, nurse, or other lab personnel is required to remove medications from a controlled inventory dispensing component.

2.1.2.7 Running Application

Before running the application, be certain that the instructions in Section 2.1.2.6, **Preparation** on page 19 have been followed.

Proceed as follows to run the maintenance application IBDiag:

1. From the Start Menu, select the **Run** command.

In the command line, type C:\DT\IBDIAG.EXE (for a DT)

In the command line, type C:\CENTRACK\IBDIAG.EXE (for a Centrack PC)

2. Select the **OK** button. The application will proceed to its Main Menu screen.

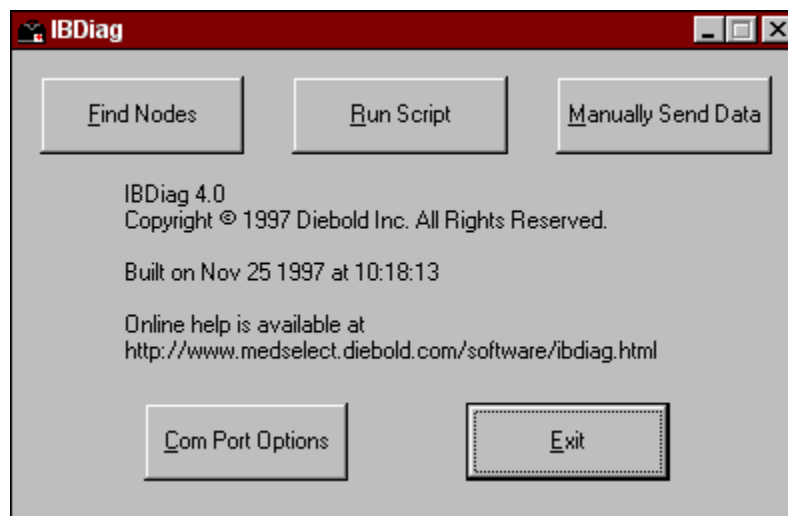


Figure 2-1 IBDiag Version 4.0 Startup Menu

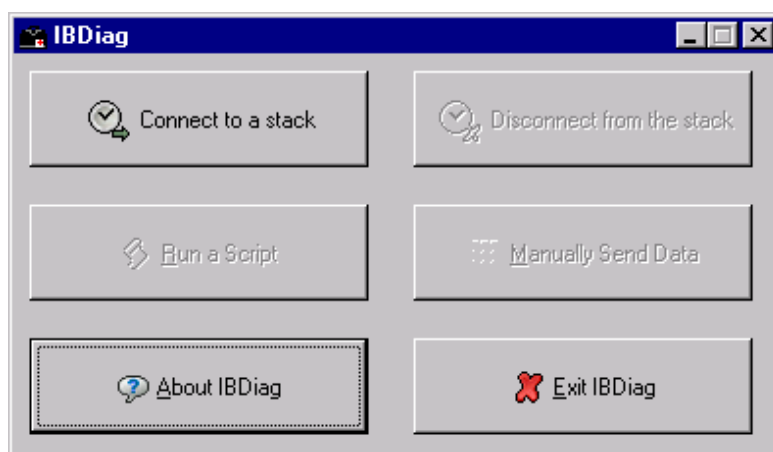


Figure 2-2 IBDiag Version 5.0 Startup Menu

With Version 5.0, you must first **Connect to a Stack**, then **Connect to a Local Stack** to begin using IBDiag functions.

2.1.2.8 Changing Com Port

1. On the Main Menu, select the **Com Port Options** button.

The Com 1 port should be selected (see Figure 2-3). Accept setting by selecting the **OK** button.

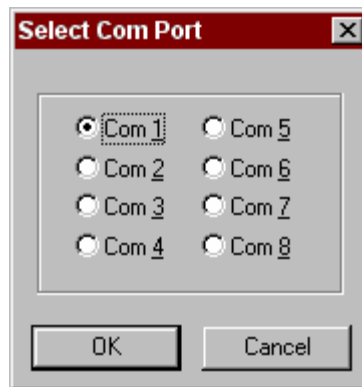


Figure 2-3 Using Com Port Command To Check Port Setting

2.1.2.9 Using Run Script Utility

1. On the Main Menu, select the **Run Script** button.
2. Select the controller type that will be under test (see Figure 2-4).

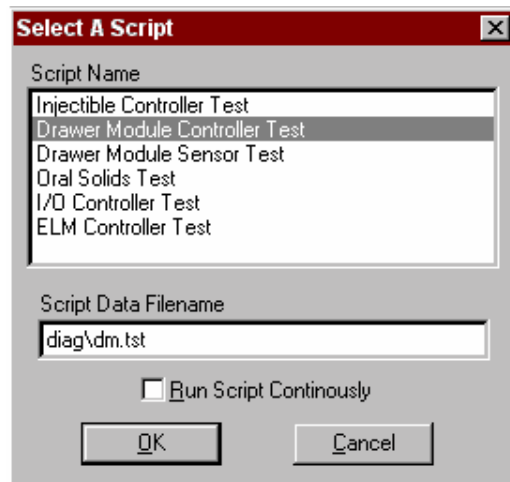


Figure 2-4 Selecting Configuration Script

3. To run the script continuously, select the **Run Script Continuously** box. Accept all settings with **OK**.

The IBDiag Script Parser dialog box (shown below) then appears.

4. Enter the controller address for the controller board that will be tested.

Be sure to enter all characters as marked on the controller chip label as shown in Figure 2-5. All addresses have a leading zero; if so, be sure to include this zero. The dispense will occur in the order of entered addresses after a 5 second delay.

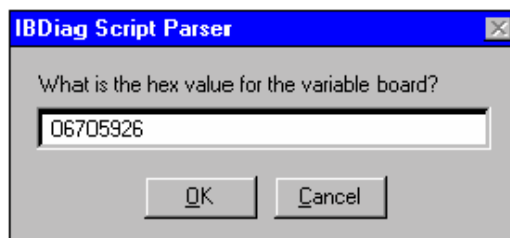


Figure 2-5 Entering IB Device Address

After the last solenoid in the script is energized, the Main Menu will reappear. If a continuous script run is selected, the IBDiag Script Parser dialog box reappears. Continuously press **OK** (ignoring the Parser Error message) until no more dialog boxes appear. The solenoids will start activating again in the previously selected configuration. This process repeats over and over until the user backs out with either the **Abort** button or keyboard **Esc** key.

2.1.2.10 Using Find Nodes Command

1. On the **Main Menu**, select the **Find Nodes** button.
2. Observe the Find Nodes dialog box, and note that the address of each IB connected device appears on the screen (see Figure 2-6).

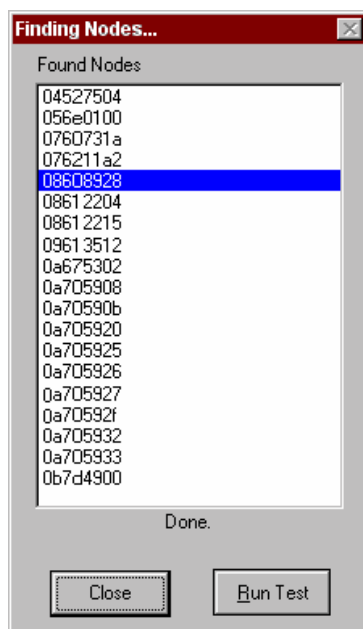


Figure 2-6 Searching Results For IB Connected Devices

Select any address from the list, then press the **Run Test** button to immediately run a script utility on that node. You must wait until all nodes have been found to run the test on a node. See **Using Run Script Utility** on page 22 for more information.

The **Esc** key may be used to exit.

2.1.2.11 Restoring System after Running Diagnostics

When the diagnostics have been completed, exit the IBDiag application and power cycle the IB module or IB hub, then reboot the DT. This will guarantee that no miscellaneous events are written to the database. Also after a power cycle, dispensing devices may take a few minutes to come back on line.

2.1.3 Advanced IBDiag

The value of a sensor position is defined as the state of the sensor. For example, the DPST door switch for an SCM can have any one of two normal possible states, and two abnormal states. The two normal states are either pressed or not pressed which indicates a switch of common to one pole or the other. The two abnormal states are both poles open or both poles shorted to ground (or common lead). Any one of these four values could appear for a position. The screen associated with this information is called the **Monitoring Address** screen.

The screen that displays this information is selected by **Run Test** on the desired node address in the **Finding Nodes** screen. A typical screen response is shown in Figure 2-7 in the **Dynamic Specific** window. Note that the screen includes additional information windows other than that mentioned in the previous paragraph. This additional information is of no importance to service personnel for troubleshooting the system and, therefore, it is not described.

When reading the information presented in the **Dynamic Specific** window, ignore any positions that are known not to exist for the monitored equipment. For example, if the ELM is being monitored, there are only eight known ports or positions. For ports connected to an SCM door switch, a position value = 1 means the switch is not depressed (door open). A value = 0 means the switch is depressed (door closed). A value = 2 (both poles open) and a value = 3 (both poles shorted to common) means a fault exists.

The procedure for running a test when a node is not known or is known follows:

Node not known:

1. If the node is not known, use the **Find Nodes Command** as previously described to generate a list of nodes associated with the system.

2. Select the node of interest from the list and click on the **Run Test** button. The **Monitoring Address** screen will appear and the test results will begin to appear.

Monitoring Address 0b7e9506

Firmware Version: 3.1
IB Revision: 3.0
Inv Positions: 8
Static General: 9
Dynamic General: 2
Static Specific: 1
Dynamic Specific: 57

Position 0 -- Value 3
Position 1 -- Value 1
Position 2 -- Value 3
Position 3 -- Value 0
Position 4 -- Value 9
Position 5 -- Value 1
Position 6 -- Value 2
Position 7 -- Value 57
Position 8 -- Value 8

Position 0 -- Value 8
Position 1 -- Value 0

Position 0 -- Value 0

Position 0 -- Value 1
Position 1 -- Value 2
Position 2 -- Value 2
Position 3 -- Value 2
Position 4 -- Value 2
Position 5 -- Value 2
Position 6 -- Value 2
Position 7 -- Value 2
Position 8 -- Value 0
Position 9 -- Value 0

Figure 2-7 Monitoring Sensor States

Node known:

1. If the node is known, use the **Run Script Utility** as previously described to bring up the **IBDiag Script Parser** screen.
2. Type the address of the controller in the provided field and click on the **OK** button. The **Monitoring Address Address** screen will appear and the test results will begin to appear.

2.2 System Troubleshooting

This section describes the procedure for troubleshooting the system by using IBDiag to identify and isolate a problem to a specific device. Review page 17 for instructions on using IBDiag before attempting to troubleshoot.

Step 1: Obtain Address List

Obtain the address list for modules at the location to be serviced. Follow these steps to retrieve a sorted list from an AWS:

1. Launch the AWS application.

Log in with the User Name and PIN that has been assigned by the system administrator (see **Obtaining User Account To Use**

During Servicing on page 11 for information on obtaining a user account).

2. Under the **Maintenance** menu, select **Configuration**, and then select **Controller**.
3. Under the **Data** menu, select **Sort**.
4. From the Column drop-down list select **display_terminal**.
5. Click **Add**, and in the new field, select **cabinet_description**.
6. Click **Add**, and in the new field, select **controller_sequence_number**.
7. Click **OK**.
8. Under the **File** menu, select **Print**.
9. Scroll through the list to find the DT.
10. Save the printout for reference.

The addresses obtained here should match any addresses acquired by using IBDiag's Find Nodes utility.

Step 2: Query Addresses

Address querying can also be performed by using the Find Nodes command (see **Using Find Nodes Command** on page 23). Compare the results of the query to the printout generated in Step 1. Use the Table 2-1 to analyze the results of the query.



The IB module or IB hub must be powered off when disconnecting the IB. Otherwise, damage to CCA circuitry can result. Likewise, do not “hot plug” a module into the IB as CCA circuitry damage could result. Always unplug the IB module or turn off the IB hub before connecting or disconnecting a module to the IB.

Table 2-1 Troubleshooting System Using Address Query Results

Find Nodes Response	Possible Problems	Corrective Action
All addresses are found.	No problems w/communications	Skip this table and continue with Step 3: Activating Positions Using IBDiag.
One address cannot be found.	<ol style="list-style-type: none"> 1. Microprocessor is locked up. 2. Problem at board level. 	<ol style="list-style-type: none"> 1. Power cycle IB module or IB hub. 2. Check cabling to board, board fuses, replace CCA.
No addresses can be found.	<ol style="list-style-type: none"> 1. Microprocessor is locked up. 2. Power is not being delivered to the Inventory Bus. 3. One or both of the zener diodes D1 and D2 are shorted on the IBPC CCA. 4. One of the CCAs on the bus is damaged and blocking the communication lines. 	<ol style="list-style-type: none"> 1. Power cycle IB module or IB hub. 2. Check IB cabling, check PWR LED on IB module or IB hub, and check fuses in IB module or IB hub. 3. Verify problem with meter and replace IB hub. 4. Unplug devices one at a time from the end of the bus until IBDiag can find all addresses still on bus. Problem exists in last device pulled from bus. Reconnect device to bus with only one of its internal CCAs powered. Find Addresses. Add CCAs within the device one at a time to IB until addresses can no longer be found. The last CCA that caused the addresses to not be found is damaged. Replace CCA.
Addresses are found intermittently.	Same as above problems #2 and #3 only.	Same as above corrective actions #2 and #3 only.

Step 3: Activating Positions Using IBDiag

Use IBDiag to run scripts that activate positions. This should be done once a problem has been narrowed down to a specific module. Use Table 2-2 to analyze the results of these tests.

Table 2-2 Analyzing Results Of Software Position Activation

Response	Possible Problems	Corrective Action
All positions activate correctly.	No problem with CCA.	Check software configuration.
One position does not activate.	CCA failure, cabling to solenoid or motor mechanical failure.	Check cabling, continue to next Response in this table.
No positions activate.	CCA failure.	Continue with Step 4: Activating Positions Manually.

Step 4: Activating Positions Manually

Use test buttons on CCA to activate positions. See specific board functional descriptions for details on how to use test switches. Use Table 2-3 to analyze the results of these tests.

Table 2-3 Analyzing Results Of Manual Position Activation

Response	Possible Problems	Corrective Action
All positions activate correctly.	No problems with CCA.	Check software configuration.
One position does not activate.	CCA failure, blown fuses, cabling to solenoid or motor.	Check cabling and fuses, replace CCA.
No positions activate.	CCA failure, blown fuses, cabling to solenoid or motor.	Check cabling and fuses, replace CCA.

2.2.1 Checking Fuses and Polyswitches

The fuse complement is listed in Table 2-4.

Note

When replacing a fuse, use its exact replacement part. No substitute fuse should be used without consulting the MedSelect Customer Support Center.

Table 2-4 System Fuse Complement

Fuse Rating	Location	Protection
2A 250V 3AG Time Delay	IB Module or IB Hub—IBPC CCA	24-Volt IB Supply
5A 250V 3AG Fast	IB Module or IB Hub—Power Supply	Main DC Power Supply
1.5A Mini (4 per CCA)	UDM CCA	Injectable Dispense Solenoids
2A 250V 3AG Fast	DM/MDM/CDM CCA	Drawer Solenoids
2A 250V 3AG Fast	ELC/SCM CCA	Lock Solenoids
2A 250V 3AG Fast	DT Power Supply	+5V and +12V Supply
2A 250V 3AG Fast	IB Repeater—Power Supply	+5V and +12V Supply

Fusing is also provided as polyswitches, which automatically reset after a cool down period. Polyswitches are CCA soldered components, and are not replaceable.

2.2.2 Troubleshooting System Cables And Connectors

The following information is intended to help in troubleshooting the system by providing pertinent cabling specifications used through the system.

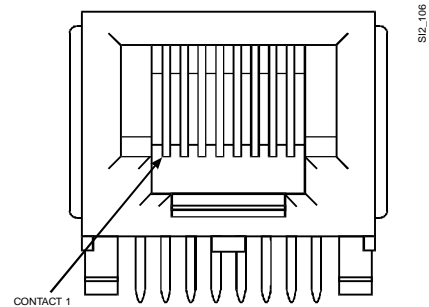
2.2.2.1 Eight Wire Modular Connector

Table 2-5 provides modular connector contact information.

Table 2-5 Eight-Wire Modular Connector

Internal Cabling For DM, CDM, or MDM Version 1.5 (Modules With Sensors)		
Contact	Signal	Wire Color
1	+24V	GRY
2	+24V	ORG
3	GND	BLK
4	GND	RED
5	COMA	GRN
6	IN	YEL
7	COMB	BLU
8	OUT	BRN

Internal Cabling For DM, CDM, or MDM Version 1.0 (Modules Without Sensors) And All UDMs		
1	+24V	GRY
2	+24V	ORG
3	GND	BLK
4	GND	RED
5	COMA	GRN
6	COMA	YEL
7	COMB	BLU
8	COMB	BRN

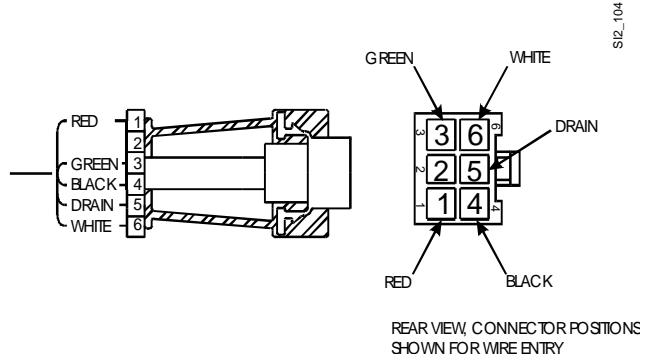


2.2.2.2 Rectangular (Molex® Type) Connector

Table 2-6 provides rectangular connector pin information.

Table 2-6 Six-Pin Rectangular Connector

Pin	Signal	Wire Color
1	+24	RED
2	KEY	NOT USED
3	COMA	GRN
4	GND	BLK
5	DRAIN	N/A
6	COMB	WHT



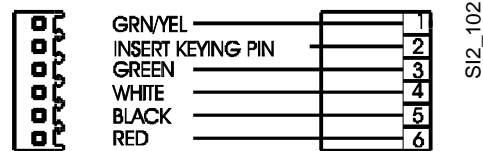
SI2_104

2.2.2.3 Insulation Displacement Connector (IDC)

Tables 2-7 and 2-8 provide IDC connector pin information.

Table 2-7 Six-Pin IDC Connector

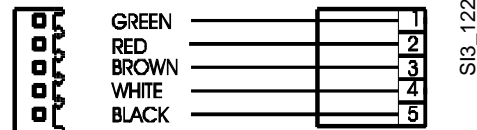
Pin	Signal	Wire Color
1	DRAIN	GRN/YEL
2	KEY	NOT USED
3	COMA	GRN
4	COMB	WHT
5	GND	BLK
6	+24V	RED



SI2_102

Table 2-8 Five-Pin IDC Connector

Pin	Signal	Wire Color
1	FWD PWR	GRN
2	REV PWR	RED
3	SW IN1	BRN
4	SW IN2	WHT
5	GND	BLK



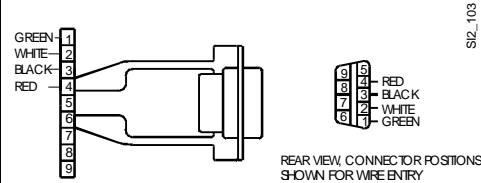
SI3_122

2.2.2.4 D-Sub Type Connector

Table 2-9 provides D-Sub connector pin information.

Table 2-9 Nine Wire D-Sub Connector

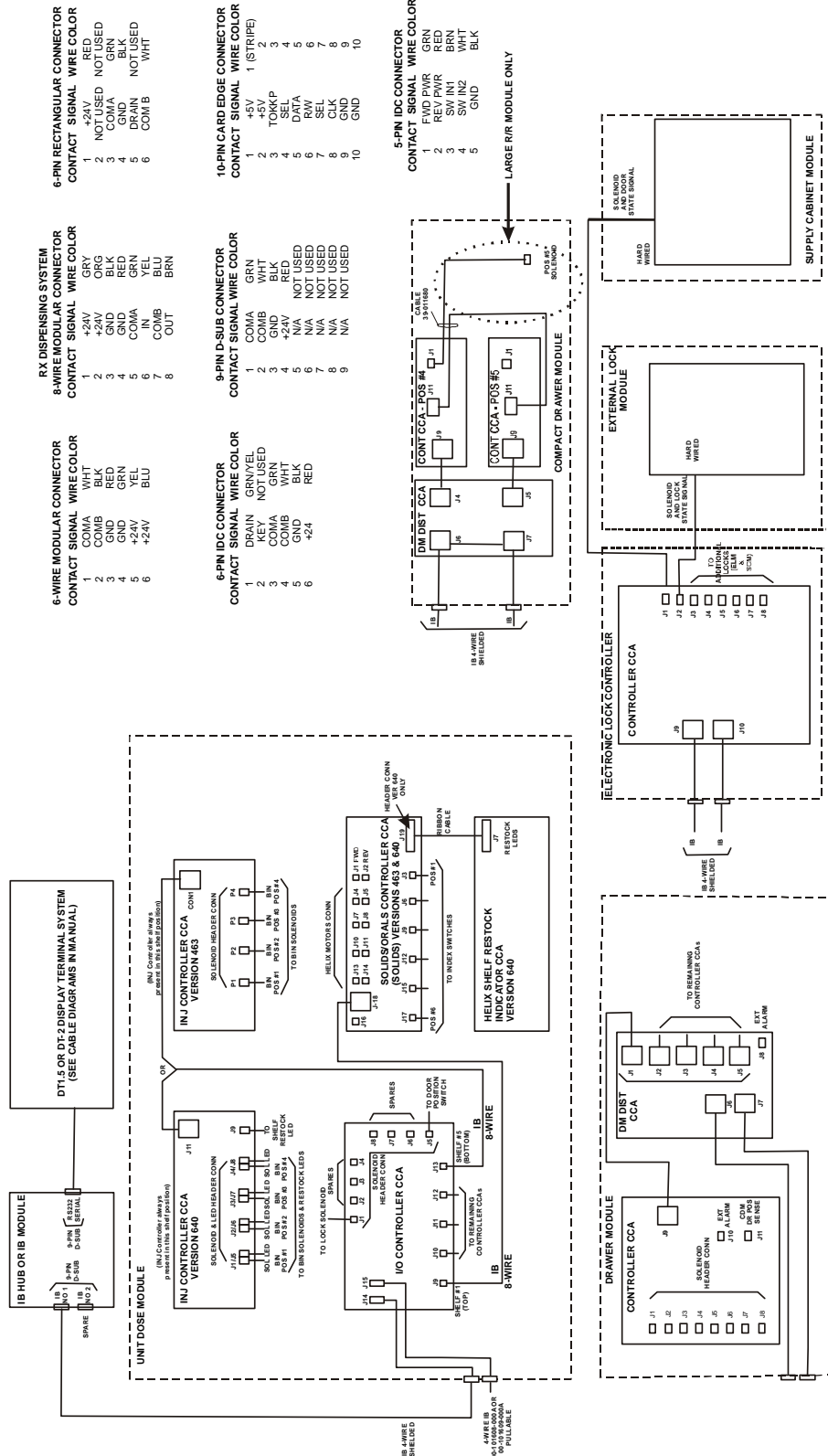
Pin	Signal	Wire Color
1	COMA	GRN
2	COMB	WHT
3	GND	BLK
4	+24V	RED
5	N/A	NOT USED
6	N/A	NOT USED
7	N/A	NOT USED
8	N/A	NOT USED
9	N/A	NOT USED



2.2.2.5 System Cable Diagram

Figure 2-7 provides a simplified diagram of system cable runs (with wire color coding), which includes connector designations. This information is gathered here, in one place, for use as a convenient troubleshooting reference.

This diagram will be particularly useful in performing continuity checks through the cable runs. Wires with identical signal names must have continuity between them. It is not necessary to unplug cables for continuity checks if a measurement is made at X10K scale or higher. Otherwise, disconnect cables if a lower scale or if a continuity checker is used. System power must be off before performing continuity checks.



516.022

MEDSELECT RX DISPENSING SYSTEM

Figure 2-8a System Cabling Diagram

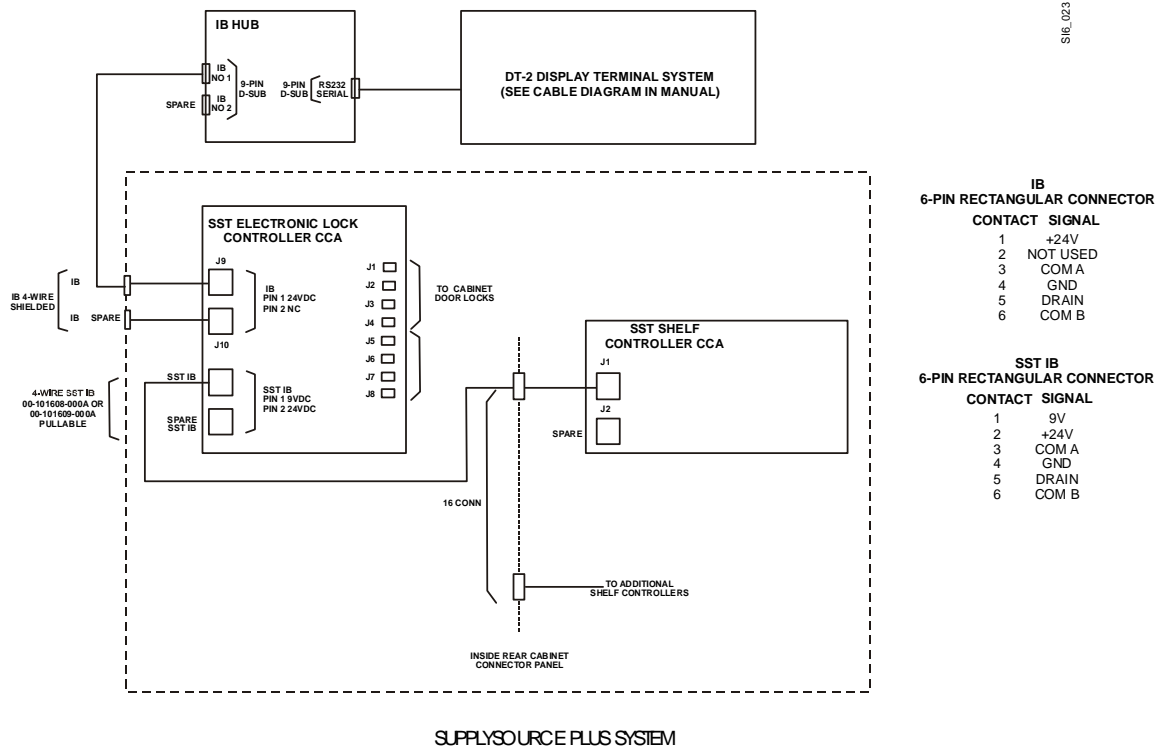


Figure 2-8b System Cabling Diagram (Continued)

3. DT1.5 and Earlier Systems Servicing

This section covers both the older version DT System and the next higher DT1.5 System version. The DT of the DT1.5 System version includes both the DT-UI and the DT-CPU. The text distinguishes between the two versions where applicable.

The following sections describe procedures for replacing only those parts of the DT that have been determined to be field replaceable.

3.1 Earlier Version DT System Description

The earlier version DT consists of a cast aluminum case that contains the following internally discrete components:

- Computer Assembly
- Touch Screen Display
- Keyboard
- Power Supply

An externally mounted card reader (either a mag-swipe reader or bar code badge reader) is also included as assemblies of the DT. The internal layout and cable routing between assemblies of the earlier version DT are shown in Figure 3-1.

Note

Figure 3-1 shows the internal assemblies that make up the earlier version DT. These assemblies are normally hidden by a security panel. This panel requires no tools for removal. A similar security panel is also used with the DT1.5 version.

This DT contains a compact 486 internally-mounted assembly, which includes the motherboard, hard drive, and items to make it essentially a complete PC. The assembly is an enclosed rugged package called the computer assembly.

The computer assembly is considered a subassembly of the DT. This assembly includes the following internal components: hard drive, LAN card, PCMCIA (token ring LAN only), and all the usually available I/O ports. Video control and video RAM are on-board. The power for the computer assembly is externally supplied by a separate power supply assembly within the DT.

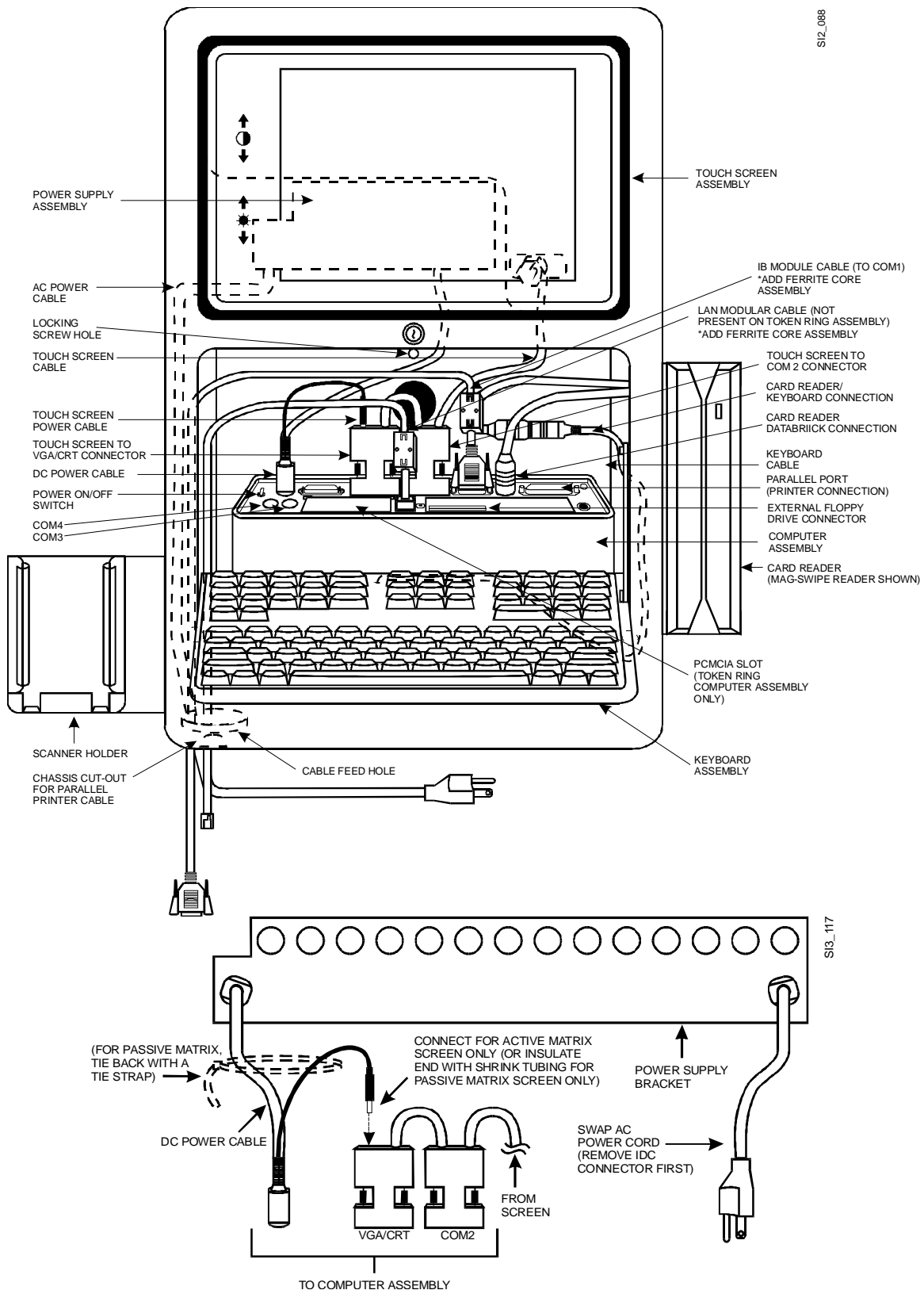


Figure 3-1 Earlier Version DT System Internal Cable Layout And Assembly Identification

Although an ON/OFF switch is provided on the computer assembly, it is not readily accessible to a user, since it is behind the security panel. This switch should always be set to ON. However, it is recommended to turn this switch to off before connecting the internal power supply to the computer assembly. (Only qualified service personnel should have access to the internal assemblies of the DT.)

3.2 DT1.5 System Description

The next version DT, known as DT1.5, does not have an internal CPU (computer assembly). Instead, an external personal computer (PC) is used. The DT is functionally the same as the earlier version DT, but with the computer assembly removed from the DT case and a remotely located PC substituted for the computer assembly. This version DT is designated the DT-UI, and the PC is designated the DT-CPU. Also, included in the DT-UI system makeup is an UPS and power strip/surge protector. Other features are covered later in this text.

The DT-CPU may be mounted on counter tops, dispensing modules, or against a wall, etc. Information concerning installing this version DT is covered in the edition "B" version of the *Installation Guide*.

Note

The DT1.5 system is pre-loaded with all software except the actual DT application. Download the DT application from the server after completely installing the DT configuration. The details for performing this download are covered in the *Installation Guide*.

The commonly used acronyms used for the equipment (latest DT version) of this configuration, and adhered to in this text, are listed below.

Acronym:

DT1.5
DT-CPU
DT-UI

UDM 640

Definition:

Display Terminal 1.5 Configuration
PC + Computer Mount
DT user interface with Touch
Screen + Card Reader + Keyboard +
Signal Cable Bundle
UDM cabinet upgrade to have
knockouts in lieu of drilling holes to
mount the DT-CPU and/or DT-UI.

THE CABLES MARKED 'A' ARE BUNDLED TOGETHER TO A 12' LENGTH AND ENCLOSED WITHIN A SPIRAL WRAP. ONLY 10' CAN BE ROUTED FROM THE DT-CPU TO THE DT-UI.
 THE CABLES MARKED 'B' ARE A 12' LENGTH AND CAN ONLY BE ROUTED 10' TO THE DT-CPU.
 THE CABLE MARKED 'C' (PRINTER CABLE) IS 15' AND CAN BE ROUTED 13' FROM THE PRINTER TO THE DT-CPU.
 CABLES MARKED 'D' MUST HAVE 2' FREE AT THE DT-CPU END. EXTENSION CABLES MAY BE REQUIRED.
 THE 2' EXTRA FOR ALL NOTED CABLES IS REQUIRED AT THE DT-CPU END FOR COMPUTER INSERTION AND REMOVAL INTO AND OUT OF ITS MOUNT.

0001, 146

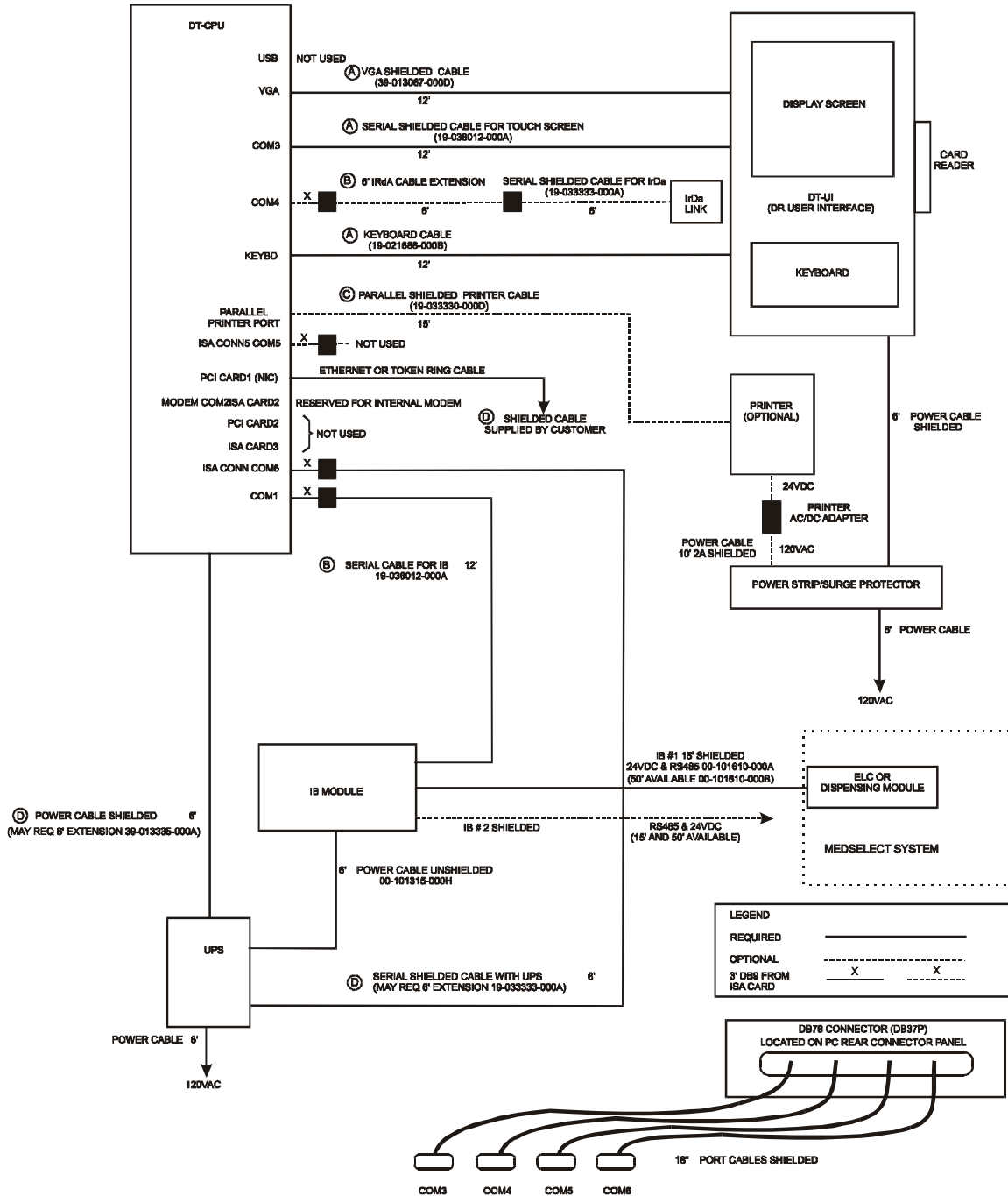


Figure 3-2 DT1.5 Configuration And Cable Connections

The DT1.5 configuration (including existing site upgrade) includes all of the above plus cabling. The basic cabling and configuration scheme for this system is shown in Figure 3-2. Several mounting hardware kits are available to accommodate the many mounting schemes for this configuration. These kits and mounting schemes are detailed in the associated MedSelect lithos.

Note

The DT-UI has the same case design as the previous DT version. Therefore, the various mounting configurations that applied to the previous DT version also apply to the DT1.5 configuration. The details for these mounting configurations are covered in the separate *Installation Guide*.

A few important servicing considerations that apply to the DT1.5 are listed below:

- All cables are standard off-the-shelf cables with molded connector ends. If a cable is damaged, it must be replaced, not repaired.
- The touch screen on the DT-UI must be calibrated after replacement. The procedure for performing this calibration is covered later in this section.

3.3 DT Components Replacement

Note

The acronym DT, by itself, is used where the information applies to both the earlier DT and DT1.5 Systems versions of the display terminal (DT or DT-UI).

Circuit card assemblies (CCAs) are not repairable and must be replaced as an item when found defective. All items that are associated with the DT and replaceable are covered in this section. Use standard procedures for returning defective parts.

3.3.1 Replacing Ferrite Core Assemblies (Earlier Version Only)

There are two ferrite core assemblies used in the DT to suppress RFI. These cores are not factory installed but are shipped separately for addition during installation. A ferrite core assembly consists of a ferrite core clamp and two split ring ferrite cores. This assembly is used on the Ethernet LAN cable and IB cable (COM1). The assembly should be located as close as possible to a computer assembly connector.

3.3.2 Replacing Computer Assembly (Earlier Version Only)

The computer assembly is held in place by four screws. These screws fasten into threaded holes on the side opposite to the connector panel of the computer assembly.

The computer assembly consists of an outer case and an internal assembly. The internal assembly contains all of the components and can be removed from its case through the security panel opening of the DT. The case can remain attached to the DT. Therefore, the internal assembly of the computer assembly can be quickly swapped out without disassembling the case of the DT. The procedures are covered below for removing an entire computer assembly or for swapping the internal assembly.

Proceed as follows to replace the complete assembly:

1. Take the DT off-line.
2. Disconnect the DT power cord.
3. Disconnect all connections to the computer assembly.
4. Separate the front and rear housings, and lay the front housing on a protective or cushioned work surface face down. The housing halves are held together by four 1/8" hex socket type screws that can only be accessed from the rear. These screws fasten through the rear housing.
5. Remove the four mounting screws from the base of the computer assembly. These screws secure the base of the computer assembly to two brackets on the bottom of the front housing. Before actually removing the computer assembly, note its orientation in the DT. It is absolutely necessary to replace the computer assembly in the same orientation.
6. Replacing an assembly is the reverse of removal. Be sure the power cord is disconnected when replacing an assembly.

3.3.3 Swapping Out Computer Assembly Internal Subassembly (Earlier Version Only)

Proceed as follows to change the internal assembly only.

1. Take the DT off-line.
2. Disconnect the DT power cord.
3. Remove the security panel.
4. Disconnect all connections to the computer assembly.
5. With a 1/8" hex wrench, remove the hex head screw from the center (next to LAN modular connector) of the connector panel on the computer assembly.

Note

It is convenient to leave one of the port connectors temporarily attached so that it can be used as a handle to extract the internal assembly from the case.

6. Slide the internal assembly from its case.
7. Replacing an assembly is the reverse of removal. Be sure to replace the security panel.

3.3.4 Replacing DT Power Supply Assembly (Earlier Version Only)

A separately packaged switching power supply is included in the DT for powering the computer assembly. This power supply is an open frame type that produces +5VDC and -12VDC.

3.3.4.1 Power Supply Board Layout

There are two connectors on the board that are designated J1 and J2. Connector J1 is associated with the primary power input (115VAC); whereas, J2 is associated with the DC outputs. The pin-out for these connectors are provided in Tables 3-1 and 3-2.

Table 3-1 Power Supply Connector J1 Pin-Out

Connector Pin	Assignment
1	AC Ground
2	AC Hot
NOTE: AC neutral is chassis ground.	

Table 3-2 Power Supply Connector J2 Pin-Out

Connector Pin	Assignment
1	+12 VDC
2	GND
3	GND
4	-5 VDC
5	+5 VDC
6	-12 VDC



Contact with exposed AC line voltage may result in death or injury. The power supply board has exposed AC line connections. 115VAC is present at the power supply fuse holder. Remove the power cord of the IB module from the AC source before replacing any internal fuses.

3.3.4.2 Assembly Replacement Procedure (Earlier Version Only)

The power supply is held in place by a bracket. The bracket, in turn, is secured to the front housing by two screws. Proceed as described in the following steps:

1. Take the DT off-line.
2. Disconnect the power cord from the power supply.

The power supply is the only assembly in the DT that receives 115 VAC power and delivers 5 and -12VDC (RED lead = +5V and WHITE lead = -12V).

3. Separate the front and rear housings, and lay the front housing on a protective or cushioned work surface face down. The housing halves are held together by four 1/8" hex socket type screws that can only be accessed from the rear. These screws fasten through the rear housing.
4. Disconnect the AC and DC power cable from J1 and J2 of the power supply assembly.
5. Remove the four hex nuts and washers from the board mounting screws.

Please note: The replacement power supply does not have mounting bracket included with it. The bracket must be removed from the defective CCA and attached to the replacement power supply.

Before actually removing the power supply, note its orientation in the DT. It is absolutely necessary to replace the Power Supply in the same orientation.

6. Lift out the power supply assembly.
7. Replacing an assembly is the reverse of removal. Be sure the DT power cord is disconnected when replacing an assembly.

3.3.5 Replacing Keyboard Assembly

The keyboard and its fold-down mounting plate are replaced as a single assembly. It is necessary to remove the two hinges on the plate and the two pivot retainers on the front housing to remove the keyboard assembly. Proceed as described in the following steps:

1. Take the DT off-line.
2. Disconnect the DT power cord.
3. Remove DT from the wall channel or pivot arm.

4. Separate the front and rear housings, and lay the front housing on a protective or cushioned work surface with the screen facing up. The housing halves are held together by four 1/8" hex socket type screws that can only be accessed from the rear of the housing.
5. Open the keyboard and remove the security panel (older models snap out by pulling left and right edges; newer models lift up and out on slots). Disconnect the keyboard cable from the computer assembly.
6. Use a 5/64" hex wrench to remove the two socket type screws that secure the hinges to the mounting plate for the keyboard.
7. Close the keyboard and secure with tape. This precaution will prevent possible damage to the keyboard assembly pivot hinges during replacement.
8. Turn over the front housing so that it is face down. Unlock the two pivot retainers for the keyboard assembly. Each retainer is held in place by a positioning pin and two socket type screws. Use a 5/64" hex wrench to remove the screws.
9. Lay the front housing face up. Remove the tape from the keyboard, and carefully work the pivots from their slots while removing the keyboard from the front. The pivot pins are loose in the keyboard mounting plate. Remove these pins and save for the replacement assembly. **NO HARDWARE IS PROVIDED WITH A REPLACEMENT KEYBOARD ASSEMBLY.**
10. Replacing an assembly is the reverse of removal. Be sure the power cord is disconnected when replacing an assembly. Use the previously retained hardware to install a keyboard assembly.

3.3.6 Replacing Card Readers

Card readers are mounted on the right side of a DT (with reference to the front of the DT). The mounting arrangement consists of a right angle, which mounts directly to the right side of the DT via three 5/32" socket hex type screws. The reader mounts to the angle via two special set screws. This mounting arrangement is necessary so that the slot of the card reader will face the front of the DT.

3.3.6.1 Mag-Stripe Card Reader

Cabling is routed through a hole in the side of the DT. A matching hole is also provided in the angle. The reader has two cables. One cable is terminated in a 6-pin female mini-DIN connector for accepting the keyboard connector. The other cable is terminated in a 6-pin male mini-DIN connector for plugging into the **KEYBOARD** port on the computer assembly. This cable arrangement allows simultaneous connection of the card reader and keyboard to this port.

3.3.6.2 Bar Code Reader

The bar code reader consists of the badge reader unit, decoder unit, and cabling (see Figure 3-3). The decoder is mounted on the inside of the security panel with Velcro. The reader unit cabling is routed to the decoder through the side, bottom, or rear hole of the DT. In order to route the cable through the side hole, it may be necessary to increase the hole diameter. When routed through the side hole, the cable has excessive length and should be looped to take up the excess and tied.

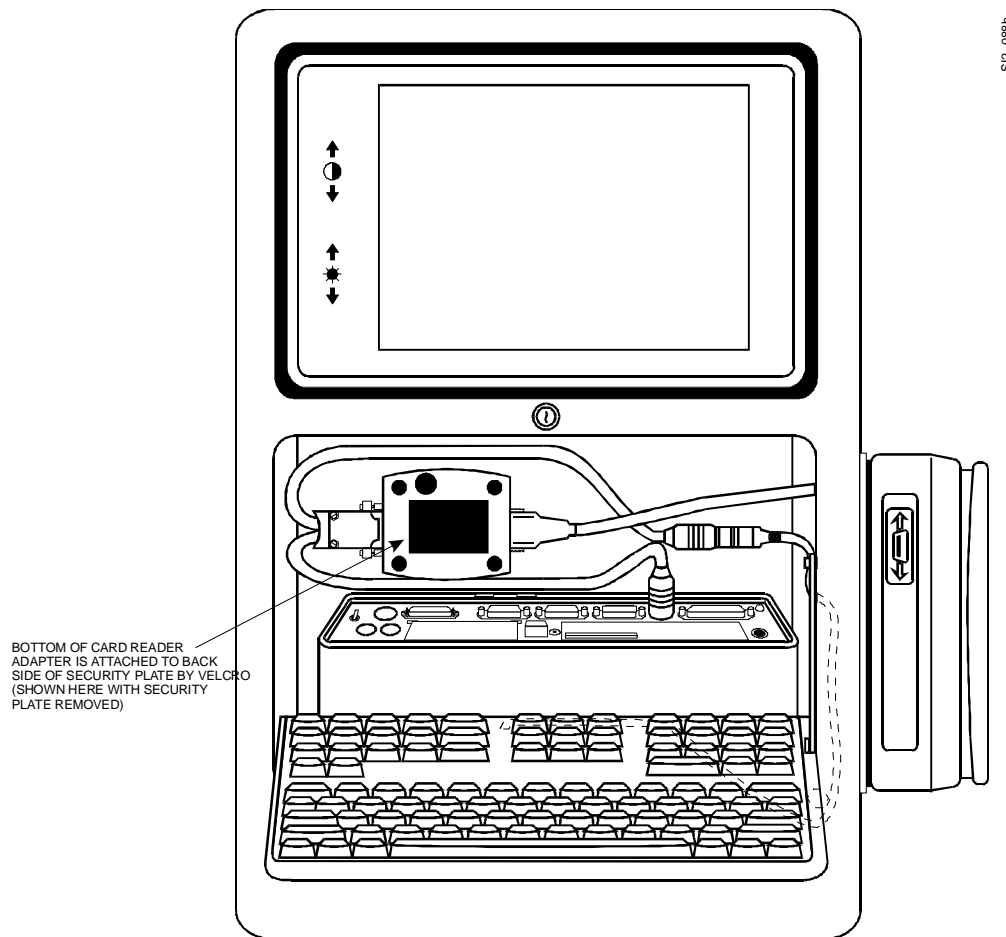


Figure 3-3 Bar Code Badge Reader Cabling

3.3.7 Replacing Motherboard Battery (Earlier Version Only)

The motherboard is located in the computer assembly. The lithium battery supplied with the motherboard should last about three years. When the battery becomes depleted, a message will appear at boot up indicating a battery failure. A failed battery will affect several PC applications, including clock failure and loss of the system setup configuration.

The battery is connected to the motherboard via cable. The cable connector is keyed to prevent an inadvertent polarity reversal connection.

3.3.8 Replacing Touch Screen Assemblies (General Information)

The touch-screen assembly consists of the swivel and touch screen. The assembly is fastened to the front housing by four socket type screws. Use care in handling the touch screen assembly. Proceed as described in the following steps:

1. Take the DT off-line.
2. Disconnect the DT power cord and active matrix screen power adapter, if used.
3. Remove DT from the wall channel or pivot.
4. Separate the front and rear housings, and lay the front housing on a protective or cushioned work surface with the screen facing up. The housing halves are held together by four 1/8" hex socket type screws that can only be accessed from the rear of the housing.
5. It is recommended to temporarily secure the touch screen assembly in place. Do not, however, apply tape directly to the screen surface for this purpose.
6. Open the keyboard and remove the security panel.

The security panel snaps out by pulling left and right edges.

7. Disconnect the touch screen assembly cable from the computer assembly. Close the keyboard.
8. Turn the front housing over so that it is face down. The assembly is held from inside the front housing by four socket type screws. Use a 5/32" hex wrench to remove these four screws.
9. Turn over the front housing so that it is face up.
10. Unsecure the touch screen assembly and carefully lift it out of the housing along with the attached cable. If an active matrix screen is used, it is necessary to unplug the power adapter from the jack at the VGA/CRT port.
11. Replacing an assembly is the reverse of removal. Be sure the power cord is disconnected when replacing an assembly.
12. Proceed with instructions for **Calibrating Windows 95 Touch Screen** on page 50.

3.3.9 Replacing Original LCD Screen with MicroTouch® Screen

DataLux® has introduced a new touchscreen which uses a MicroTouch® screen and drivers. It is physically installed in the same manner as the original LCD display. The only obvious physical difference from the original LCD screen is that the brightness and contrast controls are now raised on the front bezel. The original touch screen uses flat controls. This section contains instructions for swapping one type of display for another. This should only be necessary to replace a non-functioning screen and the replacement screen is not of the same type as the original. The new DT1.5 will use the new display exclusively, and the drivers will be installed at the factory before the DT ships to the field.

Part Number 19-040163-000A has been created to identify the new touchscreen and its drivers.

Part number 19-040052-000A identifies the original touchscreen.

Note

When installing a MicroTouch® display at an existing MedSelect site where no MicroTouch® display has been installed previously, contact C&TSC before proceeding with these instructions. C&TSC must upload the necessary MicroTouch® drivers to the MedSelect server before the MicroTouch® screen can be installed.

If an original display must be replaced with the new MicroTouch® screen, then the MicroTouch® drivers must also be installed or the screen cannot function. The Dynapro drivers used with the original display are incompatible and need to be disabled. Disabling the original touchscreen drivers after the screen has been replaced requires all commands to be executed from the keyboard.

3.3.9.1 Disabling Dynapro Drivers

Shut down the Display Terminal, then remove the original display and replace it with the new display.

Power on the Display Terminal, and then press **ALT+X** when the MedSelect logo and the message "Connecting to database" appear. This prevents the DT application from launching.

1. Press **CTL+ESC** to bring up the Start Menu.
2. Press **S** for settings.
3. Press **C** for control panel
4. Use the arrow keys to select (highlight) the **System** icon, and then press Enter to open it.
5. Use the arrow keys to select **Device Manager**.

6. Press the Tab key twice to move into the devices list, then use the down arrow key to select the **Mouse** icon.
7. Press the right arrow key to expand the device list under Mouse.
8. Use the down arrow key to select (highlight) the Dynapro SC3 driver.
9. Press **ALT+R** to open the 'Dynapro Serial SC3 properties window'.
10. Press the Spacebar to check **Disable this hardware profile**.
11. Press **ENTER** to OK and press **ENTER** again to close.
12. Press **ALT+F4** to close the Control Panel window.
13. Reboot the system.
14. During the reboot, a "Windows Mouse Support" error window appears, indicating that Windows did not detect a mouse. Press **ALT+D** to check the Do not show this message in the future and then press **ENTER**. Press **ALT+X** when the MedSelect logo and the message "Connecting to database" appear. This prevents the DT application from launching.
15. Proceed to the instructions for **Transferring MicroTouch® Drivers from Server to DT**, below.

3.3.9.2 Transferring MicroTouch® Drivers from Server to DT

The MicroTouch® drivers are present on the server. Perform the following procedure to transfers the drivers via FTP to a temp directory on the DT:

1. The DT computer should be ON but the DT application must not be running.
2. If not already present, make a **temp** folder on **C:**
3. Press **CTL+ESC** to bring up the Start Menu, then **P** for programs. Select **MS-DOS** prompt, then press **ENTER**.
4. Enter the following command: **cd c:**
5. Enter the following command: **md temp**
6. Enter the following command: **ftp medsvr**
7. Login as **oraadmin**
8. Enter the following command: **binary**

9. Enter the following command: **prompt**
10. Enter the following command: **lcd c:\temp**
11. Enter the following command: **mget /db/diskettes/touchscreen/mt/***
12. Enter the following command: **quit**
13. Proceed to the instructions for **Installing MicroTouch® Drivers** below.

3.3.9.3 Installing MicroTouch® Drivers

Perform the following procedure to install the MicroTouch® drivers.

1. Press **CTL+ESC** to bring up the Start Menu, then **R** for Run.
2. Type **C:\temp\MT52INS** (or higher revision) then press **Enter**.
3. The Setup Window appears. Allow files to load completely.
4. At the "Welcome Window", press **Enter**.
5. At the "License Window", press **Enter**.
6. At "Express Install", press **Enter**.
7. The "Copying Files Window" appears.
8. When asked to view the Readme Files, use the **Tab** key to move to the **NO** button and press **Enter**.
9. When asked to restart the computer, press **ENTER**.
10. Proceed to **Calibrating MicroTouch® Screen** below.

3.3.9.4 Calibrating MicroTouch® Screen

1. Press **CTL+ESC** to bring up the Start Menu, then **P** for Programs.
2. Use the arrow keys to select the MicroTouch® Touchware control panel then press **Enter**.

Note

The original **TOUCH** selection is still present under Programs but is not used for this display.

3. From the MicroTouch® Control Panel, follow the calibration procedure on the screen.

3.3.10 Replacing MicroTouch® LCD Screen with Original LCD Screen (Dynapro Driven)

If it becomes necessary to replace the MicroTouch® screen (Part Number 19-040163-000A) with an older, original touch screen (Part Number 19-040052-000A), then the MicroTouch® drivers must be uninstalled and the Dynapro enabled. Proceed as follows

1. Shut down the Display Terminal, then remove the original display and replace it with the new display.
2. Power on the Display Terminal, and then press **ALT+X** when the MedSelect logo and the message "Connecting to database" appears. This will prevent the DT application from launching.
3. Press **CTL+ESC** to bring up the Start Menu, then **P** for Programs.
4. Use the arrow keys to select the **MicroTouch®** then press **Enter**.
5. Use the arrow keys to select **Touchware Uninstall** then press **Enter**.
A "Confirm File Deletion" window will appear.
6. Press **ENTER** for Yes.
A "Remove Programs from Your Computer" window will appear when the uninstall completes.
7. Press **ENTER** for OK.
A "MicroTouch® Touchware has been removed..." message window will appear.
8. Press **ENTER** for OK.
9. Reboot the system, then press **ALT+X** when the MedSelect logo and the message "Connecting to database" appears. This will prevent the DT application from launching.
10. Proceed to **Enabling Dynapro Drivers**.

3.3.10.1 Enabling Dynapro Drivers

1. Press **CTL+ESC** to bring up the Start Menu.
2. Press **S** for Settings.
3. Press **C** for control panel
4. Use the arrow keys to select (highlight) the **System** icon, and then press **Enter** to open it.
5. Use the arrow keys to select **Device Manager**.
6. Press the **Tab** key twice to move into the devices list, then use the down arrow key to select the **Mouse** icon.
7. Press the right arrow key to expand the device list under Mouse.

8. Use the down arrow key to select (highlight) the **Dynapro SC3** driver.
9. Use the **Tab** key to move to the **Properties** index tab and **ENTER**.

The 'Dynapro serial SC3 Properties' window appears

10. Press the **Spacebar** to remove the check in "disable this hardware profile".
11. Use the **Tab** key to move to the **OK** button, press **ENTER**, and then press **ENTER** again to close.
12. Press **ALT+F4** to go back to close the Control Panel window.
13. Reboot the system.
14. Calibrate using the **Touch** program from the Start menu.
15. Proceed to **Calibrating Windows 95 Touch Screen**, below.

3.3.10.2 Calibrating Windows 95 Touch Screen (Earlier Version Only)

It is not necessary to exit any applications already running on the DT. This calibration routine can be run at any time. Proceed as follows to calibrate the screen:

1. If it is not already displayed, bring up the Windows 95 Start Menu by holding down the **ALT** key while pressing **ESC**.
2. Press the **Start** button, and then select **Programs**, then select **Touch**, and then select **Touchscreen Control**. This will launch the calibration application.
3. Press the **Calibrate** button in the center of the button bar at the top of the screen.
4. Touch the red X that appears on the screen, and hold for about two seconds before releasing. Repeat with the second X that appears.
5. A message will appear that the calibration is complete. Press **OK** to acknowledge.
6. The program will return to the application's main window. Press the **Exit** button on the right side of the button bar to exit the program.

3.3.11 Replacing Mag-Swipe Card Reader

The reader has two cables. One cable is terminated in a 6-pin female mini-DIN plug for accepting the keyboard connector. The other cable is terminated in a 6-pin male mini-DIN plug for plugging into the KEYBOARD port on the Computer Assembly. This cable arrangement allows simultaneous connection of the card reader and keyboard to this port.

3.3.12 Replacing Bar Code Reader

The bar code reader consists of the reader unit and decoder unit. The decoder is mounted to the inside of the DT-UI (behind the security panel) with Velcro. The reader unit is connected to the decoder via cable, which is routed through the provided hole in the side of the DT-UI as described for the mag-swipe reader. This cable has excessive length and should be looped to take up the excess and tied. The desired internal mounting arrangement is shown in Figure 3-4.

As described for the mag-swipe reader, two cables are provided for connecting to the keyboard connector and the other for the keyboard port on the computer assembly. These cables attach to the decoder unit. It is not possible to inadvertently connect cables to the wrong connector.

Figure 3-4 item number references are listed below:

Item No.:	Description:
3	DT-UI
10	Ferrite Core Clamp
11	Ferrite Core
12	DT1.5 Cable Kit
16	Card Reader, Standard Track 2, 75 BPI
17	Card Reader, Northern Computer, 3 Track
18	Card Reader, Track 3, 75 or 210 BPI
19	Bar Code Reader
22	Tape
24	Cable Tie, 1.25"
25	Cable Tie, Small
26	Adhesive
27	Blank ID Label
28	Computer Port ID Label

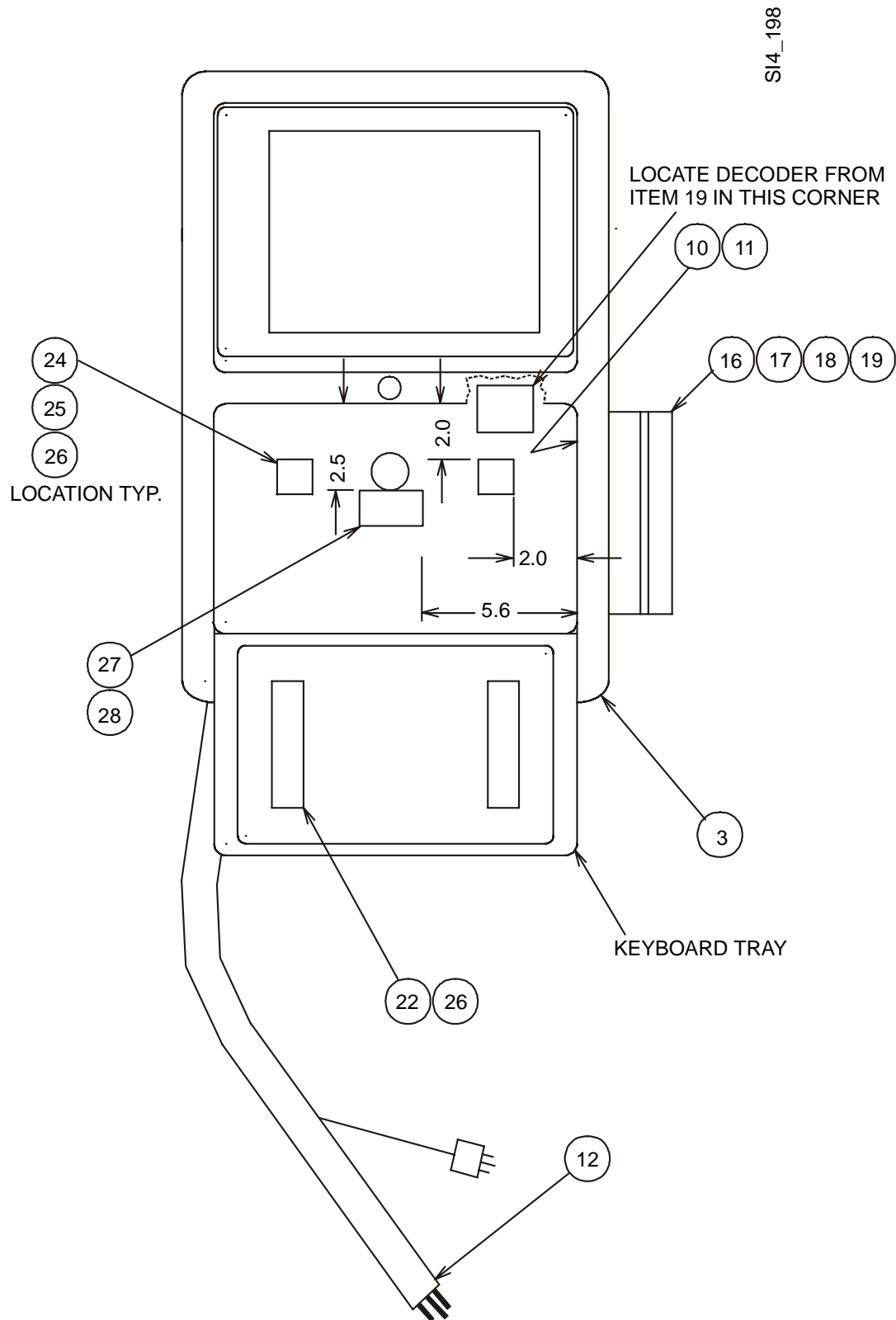


Figure 3-4 DT-UI Internal Cabling Arrangement With Mag-Swipe And Bar Code Reader

3.4 Testing Card Reader Operation

This procedure only applies to the DT1.5 and earlier systems.

3.4.1 Reader Errors

The card reader is electrically connected between the computer assembly and keyboard. When the card is read, the reader takes over the interface to the computer assembly and sends card data using the same scan codes used by the keyboard. The computer assembly does not distinguish between data from the keyboard and data from the reader.

The mag-swipe reader has a multi-color LED to indicate its status. During normal power up, the LED on the mag-swipe reader will momentarily be ORANGE and then flash RED. The LED will then light GREEN steadily. The reader is now ready to accept a magnetic stripe card.

If the reader cannot read data from a card, its LED will come on in RED. If only one track can be read, that track will be transmitted and displayed. The LED will be RED for the other track. The LED only remains on for about two seconds. The reader has a repertoire of display messages to cover various error situations.

3.4.2 Testing Reader

A simple test can be performed on a card reader to verify its operation. Do the following:

1. Start a DOS window at the DT.
2. Swipe the card through the reader.

At the DOS prompt, the numbers that are printed on the card should appear, in addition to the prefix and suffix characters.

3.5 Adjusting DT Power Supply Voltage (Earlier Version Only)

A single potentiometer is provided on the power supply board in the DT for adjusting the DC output voltage. Check the output voltage between J2-5 (+5VDC) and J2-3 (ground lead). This voltage should be a nominal 5VDC ($\pm 1\%$). Adjust the potentiometer as necessary to obtain this voltage under load (for example, with the DT connected to the system).

3.6 DT1.5 System and Earlier Version IB Module Troubleshooting

Table 3-3 DT1.5 System And Earlier Version IB Module Troubleshooting

Symptom	Possible Cause	Corrective Action
NOTE: The LEDs that are described below are located on the IB module. See Diagnosing LED Responses on page 65 for a description on reading the LED responses.		
LED sequence indicates many collisions.	IB or local device bus may have an intermittent connection or short.	See Section 2.2 for troubleshooting process.
LED sequence indicates repeated communication establishment tries with a device.	IBPC CCA or device controller may be defective.	See Section 2.2 for troubleshooting process.
Constant LED ON state (any LED except PWR).	IBPC CCA may be defective.	See Section 2.2 for troubleshooting process.
Dispense does not operate on all modules and no LED activity.	Controller CCA or IB cable may be defective.	See Section 2.2 for troubleshooting process.

4. DT-2/2.5 System Servicing

4.1 DT-2/2.5 Description

This section covers the DT-2/2.5 System which is the latest and next higher version to the DT1.5 System. The DT-2/2.5 System uses many of the same components as the DT1.5 System, but with some mechanical and software revisions that can impact servicing.

The DT-CPU now uses the Windows 2000 operating system and a redesign of rear port connections. Also, touchscreen power is now derived internally from the DT-CPU and ported by cable to the touchscreen power connector. The touchscreen itself is a new product that will always display no matter how low the screen brightness is set or how dark the contrast is made. The purpose of this feature is to indicate that the screen is operational under any viewer setting. The screen can also be tilted to eliminate glare. A display on-off switch is located on the screen bezel.

The usual display adjustments such as sizing, centering, etc. can also be performed at the front bezel via a built in menu (button activated). Generally, no other adjustments or calibrations (e.g., touch position) are required for the touchscreen since it is always shipped ready for use. In the event touchscreen calibration is needed or a driver upgrade is required, factory procedures are provided in this section.

Note

An attempt has been made to make this section independent of previous DT system versions. This may result in some repetition of information that can be found elsewhere in this manual.

The basic cabling and configuration scheme for this system are shown in Figure 4-1.

Detail of DT-CPU Connections

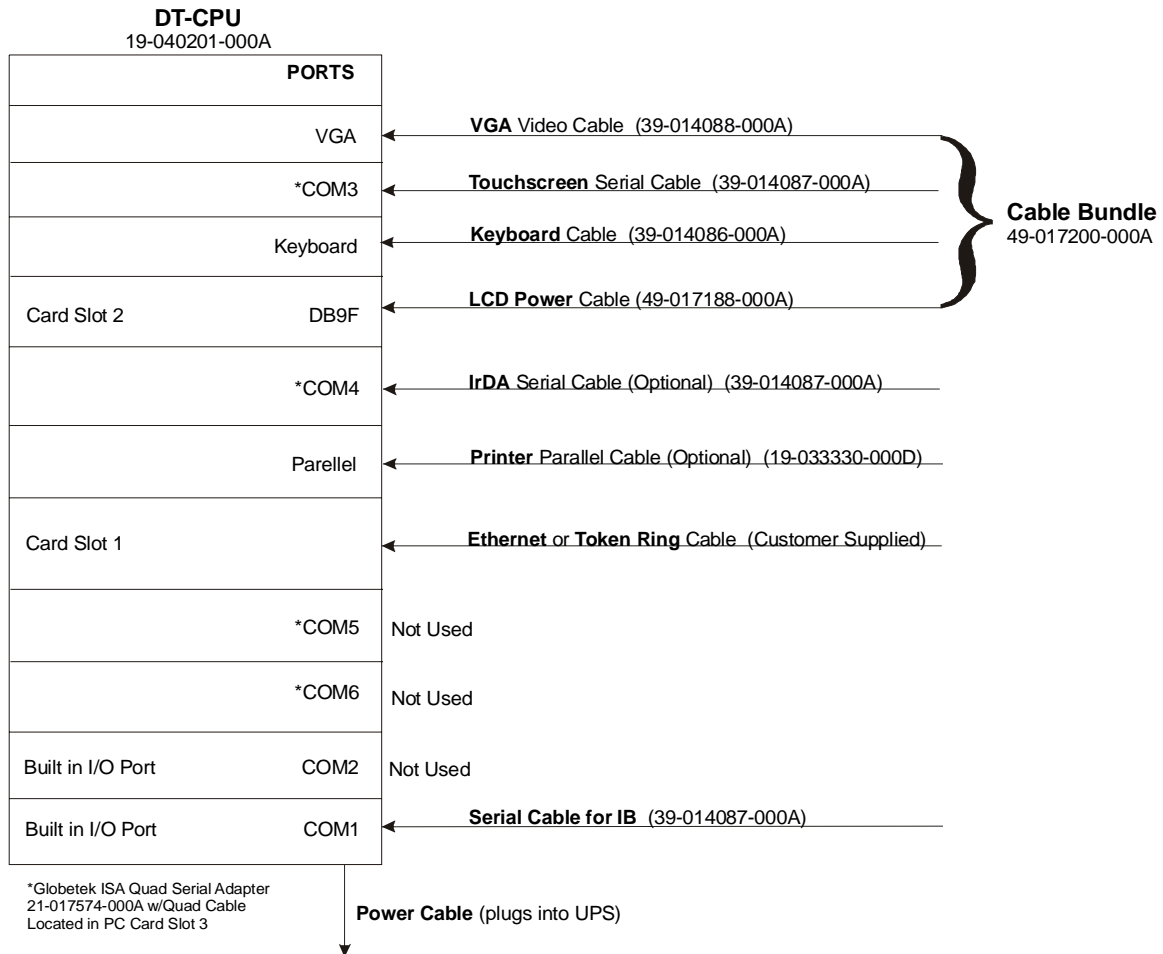


Figure 4-1b DT-2/2.5 Configuration And Cable Connections

4.2 DT-UI Components Replacement

There are only five replaceable items associated with the DT-UI and are shown in Figure 4-2. These items are listed below and covered in this text:

- Touchscreen display (mounted to display support bracket assembly via torque hinge assembly)
- Keyboard (mounted on key board shelf which is an extension of the display support bracket assembly)
- Torque hinge assembly (consisting of pivot rod and pivot mount bracket)
- Cable bundle assembly
- Card reader (which is mounted beneath the keyboard shelf via the card reader bracket)

Refer to Figure 4-2 for the location of major parts.

Note

Table 4-1 may change as revisions dictate.

Table 4-1 DT-UI Major Components

Description	DT-2.0 Part Number	DT-2.5 Part Number
MONITOR SUPPORT BRACKET	49-017179-000A	49-017179-000A
MONITOR SUPPORT FRAME	49-017180-000A	49-017180-000A
TORQUE HINGE	49-017201-000A	49-017201-000A
PIVOT SUPPORT MONITOR BRACKET	49-017183-000A	49-021282-000A
LCD W/TOUCHSCREEN VIDEO MONITOR	49-017198-000A	49-021285-000A
101 KEY PS2 COMPACT KEYBOARD	49-017199-000A	49-017199-000A
KEYBOARD SHELF	-	-
CARD READER	-	-

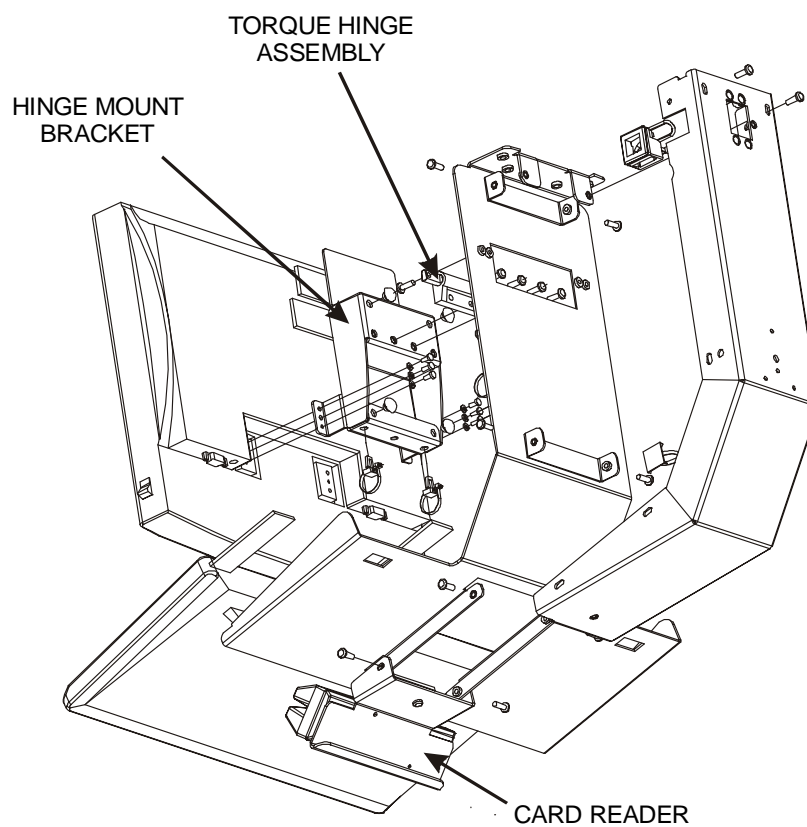
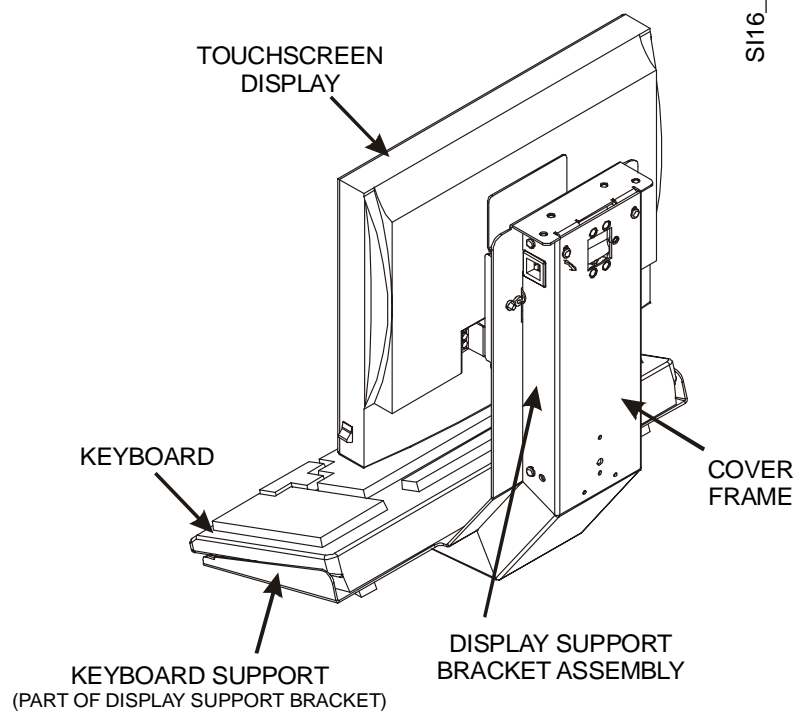


Figure 4-2 DT-UI Major Components

It is not necessary to remove the DT-UI from its channel when supported by the extended mount. This statement is also true for the flush mount, except when replacing the cable bundle. It is recommended to remove the DT-UI from the channel first to relieve weight on the cover for the display bracket assembly. The DT-UI is supported by the flush mount adapter that is, in turn, mounted to the cover.

4.2.1 Replacing Touchscreen Display

The touchscreen display is attached to the display support bracket assembly by the torque hinge assembly. It is not necessary to unmount the DT-UI from the channel. The torque hinge assembly is mounted to the touchscreen display case via its pivot mount bracket.

Replace the touchscreen display as follows:

1. Remove all cables to touchscreen display. A wire tie is used to secure the power connector by tying it to the adjacent serial port connector. Snip off the wire tie.
2. Use assistance for this step. There are three small phillips head screws on each side (total of six) of the display that attach the touchscreen display case to the pivot mount bracket. Use a #1 phillips offset head screwdriver. A strip of Velcro is also used between the rear of the touchscreen display case and pivot mount bracket. (Later versions of the DT-UI have screwdriver access holes on the rear of the cover frame.)
3. When replacing the touchscreen display, be sure to add the wire tie across the port and power connectors.

4.2.1.1 Installing Touchscreen Drivers

The drivers are already installed on a shipped system. If for some reason the drivers need to be reinstalled, they can be found on the DT-CPU under the directory path **C:\DRIVERS\TOUCHSCREEN**.

To install these drivers, run setup and follow the screen menus.

4.2.1.2 Calibrating Touchscreen

The touchscreen calibration is performed as a part of the touchscreen driver installation, above.

4.2.2 Replacing Keyboard

The keyboard is held to the keyboard shelf portion of the display support bracket assembly by Velcro. To aid in alignment, two cut outs are provided in the shelf to accept the extended prop legs of the keyboard. All cabling is routed underneath the keyboard and into a well within the shelf.

Replace the keyboard as follows:

1. Pull the keyboard free of the Velcro.
2. Snip the wire tie inside the well of the shelf.

3. Pull out the excess cable and disconnect.
4. When replacing the keyboard, be sure to add a wire tie to secure the keyboard cable to the wire tie mount.

4.2.3 Replacing Touchscreen Torque Hinge Assembly

The torque hinge assembly attaches the touchscreen display to the display support bracket assembly and provides a means to tilt the display for glare free viewing. The torque hinge is secured to its mount bracket with two Phillips-head screws and to the display support bracket assembly with two Phillips-head screws at each end.

Replace the torque hinge as follows:

1. Remove the touchscreen display as previously described.
2. The torque hinge assembly can then be released from the display support bracket assembly by removing two Phillips-head screws. Use a #1 Phillips-head screwdriver.

4.2.4 Replacing Cable Bundle Assembly

The only situation that will require removing the cable bundle assembly is when it is defective. If wires are added, such as for an option, they can be inserted through the slit of the protective spiral wrap and fished through the display support bracket assembly. When the touchscreen display is removed, an opening is exposed in the display support bracket assembly, which makes removing or fishing the cables a simple task.

The cable bundle assembly is tie-wrap secured in several places at the DT-UI display support bracket assembly. Note the locations of all tie wraps and their means of attachment before removing the cable bundle assembly. Then restore with new tie wraps during replacement.

1. Remove all tie wraps that secure the cable bundle assembly to the DT-UI.
2. Remove the touchscreen display as previously described.
3. After all connectors are disconnected from the display, pull the cable bundle free of the display support bracket assembly and cover frame.
4. At the DT-CPU rear connector panel, disconnect all connectors associated with the cable bundle assembly.
5. Install a new cable bundle in the reverse manner as removal. Refer to Figure 4-1 for connection destinations.

4.2.5 Replacing Card Reader

There are two types of card readers that may be used with this system:

- Magnetic Strip
- Barcode Reader

Both card readers are mounted to the key board support portion of the display support bracket assembly in the same manner. Two screws (use a #1 Phillips-head screwdriver) are used to secure a card reader the card reader bracket and three screws (use a #2 Phillips-head screwdriver) are used to secure the bracket beneath the keyboard shelf. Separate the reader from its bracket (not supplied with reader). It is necessary to lift the keyboard off the shelf to obtain access to the cable access area within the shelf. The keyboard is secured in place by Velcro.

The bar code reader has a separate decoder unit. The decoder is mounted inside the keyboard shelf (under the keyboard) with Velcro.

Refer to Figure 4-1 for connection details. All cabling can be hidden inside the keyboard shelf. A ferrite core is needed on the card reader cables (core covers both cables). The ferrite core is also hidden inside the shelf and is placed close as possible to the reader.

When replacing the keyboard, be sure to extend its feet and insert them into the provided cutouts on the shelf.

4.3 DT-2 System IB Module Troubleshooting

Table 4-2 DT-2 IB Module Troubleshooting

Symptom	Possible Cause	Corrective Action
NOTE: The LEDs that are described below are located on the IB hub. See Diagnosing LED Responses on page 65 for a description on reading the LED responses.		
LED sequence indicates many collisions.	IB or local device bus may have an intermittent connection or short.	See Section 2.2 for troubleshooting process.
LED sequence indicates repeated communication establishment tries with a device.	IBPC CCA or device controller may be defective.	See Section 2.2 for troubleshooting process.
Constant LED ON state (any LED except PWR).	IBPC CCA may be defective.	See Section 2.2 for troubleshooting process.
Dispense does not operate on all modules and no LED activity.	Controller CCA or IB cable may be defective.	See Section 2.2 for troubleshooting process.

5. IB Module and IB Hub Servicing

The IB module or IB hub contain the following major items:

- IBPC Controller CCA
- Daughterboard CCA
- IB Power Supply

The IB module or IB hub provide the communication interface between the DT and system devices. The module also contains the power supply for all on line IB devices. A malfunction in the power supply will affect all IB connected devices. When servicing the system, first check that the power supply is operating properly.

5.1 IBPC Controller CCA Functional Description

Refer to Figure 5-2 for a functional block diagram of the IBPC Controller CCA. The purpose of this controller CCA is to translate the full duplex RS232 serial communication from the DT to half duplex RS485 for the IB. The RS232 is at connector P4 and the RS485 is at connectors P2 and P3. Power input is at P1.

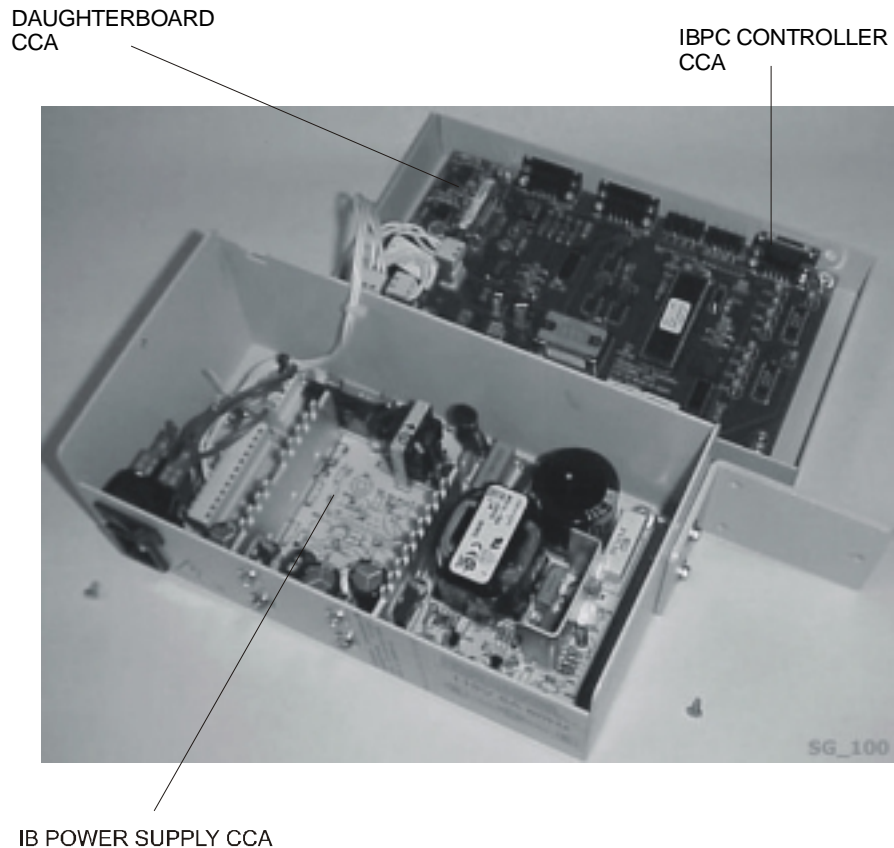


Figure 5-1 Inside of IB Hub

LEDs are provided on-board. These are visible through the IB module or IB hub case for monitoring the RS232 and RS485 communication protocol and indicating that the microprocessor is running.

Table 5-1 provides the IBPC LED response signatures to common communication exchanges between devices on the IB. The LED layout for the IBPC CCA is included in the table. This table is a troubleshooting aid and, consequently is located in the troubleshooting procedure for this module.

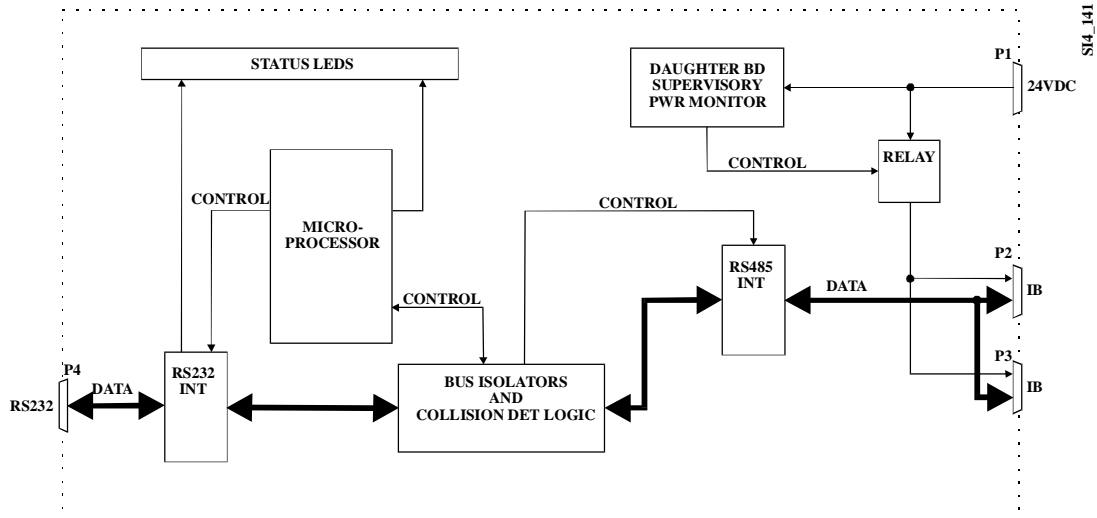


Figure 5-2 IBPC Controller CCA Functional Block Diagram

5.2 Daughterboard CCA Description

A daughter board (Figure 5-1) is mounted directly onto the IBPC CCA. This board is designated the Power Monitor CCA and is designed to monitor the voltage from the IB module or IB hub power supply and shut down the power to the IB should the supply voltage drop below 19.5V +/- 1.0V. Once the power supply voltage has returned to normal, the circuit will delay for at least 2.5 seconds before turning power back on to the IB. For a momentary drop out of power, the delay is dependent on the capacitance of the bus, which is determined by number of CCAs on bus, and could be as long as 30 seconds. On initial power up of the IB module or IB hub, there is a 2.5 second delay before power is present at the IB. Power is supplied to the IB when a relay on the board is energized. The state of relay is controlled by the power monitoring circuit.

5.3 Case Grounding

RS232 D-Sub connector P4 is not grounded to the IB module or IB hub case. The case is cutout around the connector housing so that a ground loop cannot be completed between the DT and IB module or IB hub. The RS232 bus shielding is grounded at the DT and to earth ground via the power plug ground prong. The IB module or IB hub case is also grounded through the ground prong of its power plug.

However, grounding of the connector (P4) to the case will generally not cause any problems; “breaking the loop” is a precaution against ESD strikes.

The ungrounded connector (P4) does not have the physical support of the case. To prevent lifting of connector from the CCA lands, the mounting design uses board locks. These are metal tabs that extend through the board and are secured with solder. Connectors P2 and P3 also use this arrangement.

5.4 IB Module and IB Hub Components Replacement

Circuit card assemblies (CCAs) are not repairable and must be replaced as a whole unit when found defective. Use standard procedures for returning defective parts.

5.5 IB Module and IB Hub Troubleshooting

Determine whether the malfunction is a communication error or power failure over the IB.

5.5.1 Diagnosing LED Responses

The LED responses listed in Table 5-1 not only indicate the IBPC communication activity with the IB devices, the responses also indicate malfunctioning devices.

Table 5-1 IBPC LED Responses


		
LED	Response	Interpretation
<i>Discrete LED Responses</i>		
CRES	Off On	Idle state. Collision has been recognized.
BUSY	Off On	Not busy. Busy transmitting data. If this LED and COLL LED is ON, a collision has been detected.

Table 5-1 IBPC LED Responses

PWR	On Off	Board is alive. Board is not alive.
COLL	Off On	Ready state. Not ready. If this LED and BUSY LED is ON and TXEN (TXE) is OFF, a collision has been detected.
DTRX	Off On	Receiving or transmitting data from/to the IB. Not receiving or transmitting data from/to IB. Dim when receiving or transmitting pulse train.
TXEN	Off On	RS485 receiving data from IB. If a collision is detected, TXE LED is OFF. RS485 transmitting data to IB.
DTTX	Off On	Transmitting data to the IB. Not transmitting data to IB. Dim when receiving or transmitting pulse train.
<i>Combination LED Responses</i>		
BUSY COLL TXEN CRES	Off-On-Off Off-On-Off Off-On-Off	Collision detected when these three LEDs flash together.
DTRX DTTX TXEN	Off-On-Off Off-On-Off Off-On-Off	Contact being established with connected devices when these three LEDs flash together. Note that the DTRX and DTTX LEDs flash at a dimmer level than the TXEN LED.
BUSY DTRX Then TXEN DTRX DTTX	Off-On-Off Off-On-Off Off-On-Off Off-On-Off Off-On-Off	Data packet being received from the IB when this LED combination of BUSY and DTTX flashes. The TXEN and DTTX LEDs are OFF. Receipt of packet by the RS232 bus acknowledged when this LED combination occurs.
DTRX DTTX TXE Then BUSY DTRX	On-Off-Off On-Off-On On-Off-On On-Off-On On-Off-On	Attached devices queried for presence every five seconds. The DTRX, DTTX, and TXE LEDs flash first. Then the CTS and DTRX LEDs flash. Two-flash combination called pinging.
DTRX TXE DTTX	On Constant On Constant On Constant	Possibly defective IBPC.
DTRX TXEN DTTX	Off Constant Off Constant Off Constant	Possibly defective IBPC. DT-CPU may also be frozen.
PWR All other LEDs	On Off	Possibly defective IBPC. DT-CPU may also be frozen.
BUSY DTRX	On Constant On-Constant	Possibly defective IB device.
PWR CRES All Others	Off Constant	Possibly disconnected RS232 cable to the DT-CPU or the DT-CPU may be powered OFF.

5.5.2 Diagnosing Power Loss

Should the 24 VDC IB power dropout, first check the output of the power supply. If the 24 VDC is present at this point, suspect connector P1/J1 connection at the IBPC as the fault. If the fault is isolated to any circuitry on the CCA, the whole unit must be replaced. A power loss could also be a result of the power monitor circuit detecting an out of tolerance condition. If an IB power repeater is used, then only the down stream devices will be affected by a defective power supply in the repeater. The upstream and down stream supplies are effectively isolated from each other, including separate fusing.

5.5.3 Tracing Power Supply Connector Voltages

There are two connectors on the board that are designated J1 and J2. Connector J1 is associated with the primary power input (115 VAC); J2 is associated with the DC outputs. The pin-outs for these connectors are provided in Tables 5-2 and 5-3.

Table 5-2 Power Supply Connector J1 Pin-Out

Connector Pin	Assignment
1	AC Ground
2	AC Neutral
3	AC Hot

Table 5-3 Power Supply Connector J2 Pin-Out

Connector Pin	Assignment
1	24 VDC
2	24 VDC
3	24 VDC
4	Return
5*	Return
6*	Return
7	Return
8	24 VDC
9*	24 VDC
10	NC
11	NC
12	Key Pin
13	NC
* Only these pins are used	

5.6 IB Power Repeater Troubleshooting

This module is used to repeat the 24 VDC power source of the IB. The signal lines of the IB are routed through the module without interruption, except the output through connector is a DB9 instead of the standard rectangular (molex) IB connector used throughout the system. This keying will prevent inadvertent cross swapping of the input and output runs of the IB which could damage either power supply. Therefore, a special cable is needed for this section of the IB daisy chaining link to the first device. This special cable is supplied with the IB repeater.

6. UDM Servicing

This section covers servicing information for the UDM **Version 463** (P/N 00-101463-000A) and **Version 640** (P/N 00-101640-000A) and includes functional descriptions, replacement information, and troubleshooting.

Servicing is broken down into the following subcategories:

- UDM Common Servicing
- UDM Injectable Dispensing Bin Shelf Servicing
- UDM Solids/Orals Helix Shelf Servicing

6.1 UDM Common Servicing Overview

The UDM common servicing is divided into the two major topics:

- Injectable bin dispensing
- Helix (orals or injectables) dispensing

The information that follows applies to both configurations, unless otherwise noted by version reference.

Basically, **Version 640** is designed for a higher helix med capacity (9, 12, 18, and 24); whereas, the earlier **Version 463** was designed for 8, 10, 15, and 20 capacities.

Additional upgrades to **Version 640** for the user include:

- Single roller for injectable bins.
- Front located restock shelf indicator for each injectable bin shelf and a restock indicator for each bin (located on solenoid cover).
- Front shelf located restock indicator for each helix (solids/orals and injectables helix) dispense position.

Additional upgrades to **Version 640** for service include:

- Conveniently located and accessible test buttons for each injectable bin dispense position. A bin no longer needs to be removed and connected by an extended cable to access its test button.
- New controller board that will accept old and new version injectable bins. New bins can also be used with the old version controller, but the restock indicator will be disabled.
- Built-in hardware error detection for the injectable bins using a blink-coded indicator located on the controller CCA.

- On-board shelf position DIP switches for identifying a shelf location in the UDM for both the bin and helix shelves.
- On-board bin configuration DIP switches for identifying injectable bin output position for injectable bin shelves. This feature already exists for the helix shelves.

6.2 UDM Basic Setup

A UDM is identified by a label assignment in the AWS software. If a UDM has been labeled “Unit Dose Module 2”, it does not matter where on the IB the UDM is located; the system always identifies the controller as UDM 2. Therefore, it is important that UDMs be arranged in the order of their descriptions when they are installed.

A UDM can include five injectable dispensing bin shelves or four helix dispensing shelves. A combination of both shelves may be used, but the bottom or fifth shelf must be an injectables dispensing bin shelf. For each shelf, there are a variety of dispensing bin or helix sizes that can be used.

Bins cannot be mixed with helixes on the same shelf. A shelf must be entirely one type or the other, because the controller CCA for a dispensing bin shelf is different from the controller CCA for a helix shelf. However, injectable helix and oral helix dispensing positions can be combined on a helix dispensing shelf.

The five shelves are numbered 1 to 5 from top to bottom. A particular dispensing position on a shelf is identified by the shelf number followed by the dispensing position number, counting from left to right and starting with number 1.

The UDM may contain any of three different types of dispensing shelves. A summary of the various dispensing capabilities and limitations of a UDM are provided below:

Injectables Dispensing Bins

This bin holds injectables such vials and ampules. Items in the bin lie on their sides and roll toward the front of the bin, where they are released by a gate. A shelf with injectables dispensing bins cannot contain any other dispensing types.

Orals Helix Dispensing Shelf

This dispensing shelf consists of a motor driven coil or *helix* that stores solid medications (sometimes called oral), such as blister packets and foil packets. A shelf containing orals helix dispensers might also include injectables helix dispensers.

Injectables Helix Dispensing Shelf

This dispensing shelf also uses helixes, but stores injectables instead of orals. It is sometimes used instead of an injectables dispensing bin. A shelf containing

injectables helix dispensers might also include orals helix dispensers.

6.3 Shelf Configuration and Dispensing Position Numbering

The following section describes the various shelf configurations and the method of system identification of dispensing positions through the use of logical position numbering.

6.3.1 Injectable Bin Shelf

The injectable bin shelf configuration and position numbering scheme is described below.

6.3.1.1 Configuration

The various bin sizes and combinations that can be fitted on a shelf are shown in Figure 6-1. The figure also includes the controller CCA bin cable connection for each configuration. The connector designation may be prefixed with a P or J, depending on version. The dispensing bin number shown in the figure does not necessarily correspond to its connector designation on the controller CCA.

6.3.1.2 Position Numbering

For a typical configuration, Figure 6-2 shows the method of identifying bin positions on a shelf. The bin positioning number does not necessarily correspond to its communication port number on the controller CCA. The first number identifies the shelf and the second number identifies the logical position order of the bin on the shelf.

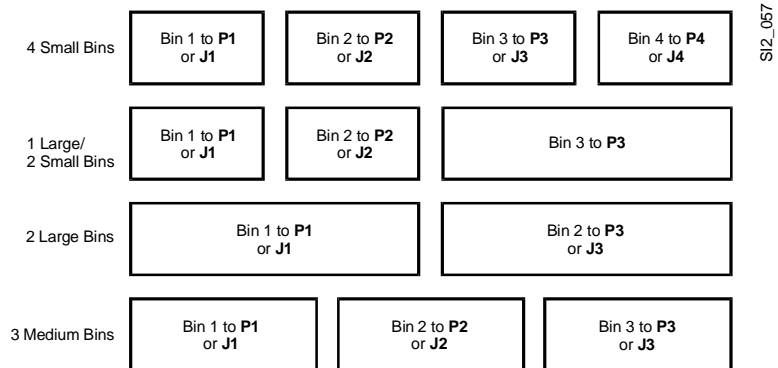


Figure 6-1 Dispensing Bin Controller Port Connections For Typical Injectable Bin Configurations

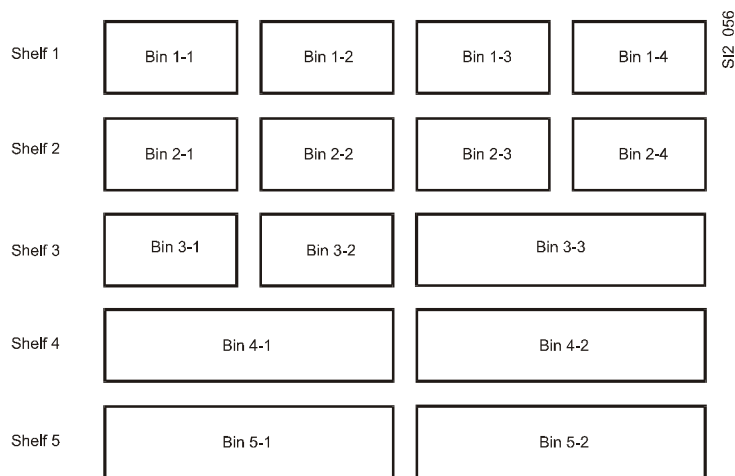


Figure 6-2 Dispensing Bin Position Numbering For Typical Injectable Bin Configuration

6.3.2 Solids/Orals Helix Shelf

Helix shelves are used for dispensing either solids/orals medication packages. **Version 463** helixes are available in various pitches that provide 8, 10, 15, and 20 medication capacities to accommodate packages with different thickness. **Version 640** is designed for higher capacity with helix pitches of 9, 12, 18, and 24. Also, to accommodate different heights in package sizes, two different helixes of 1" (2.54cm) and 1.4" (3.6cm) outside diameters are available.

The first helix dispensing position on the left is always position 1 on that shelf, regardless of its configuration. Each position to the right is then numbered consecutively, regardless of their configurations. *Combining adjacent positions by disengaging a motor does not cause a skip in position numbers.* Position numbers are shown in Figure 6-3.

6.3.2.1 Standard Configurations

There are three standard solids/orals helix motor configurations. Each is described in the following paragraphs.

6.3.2.2 Single Helix, Single Position (SHSP) Configuration

This is the standard, one helix motor configuration. Six single helixes can fit on one UDM shelf.

6.3.2.3 Single Helix, Double Position (SHDP) Configuration

This motor configuration supports drugs that are too wide to fit into a single helix position, but are not so wide as to require two helixes. When this occurs, a permanent divider and the plastic length guides are removed to combine adjacent positions. This increases the width of a compartment to double its normal size, and one of the helix motors is disabled by placement of a jumper at the motor position.

6.3.2.4 Double Helix, Double Position (DHDP) Configuration

This motor configuration supports drugs that are too wide to be placed in a single helix. A permanent divider is removed so that adjacent positions are combined. One of the helixes is then replaced with a helix that is wound in the opposite direction, and the motor is reconfigured to spin in the opposite direction as well.

All three helix configurations are shown in Figure 6-3.

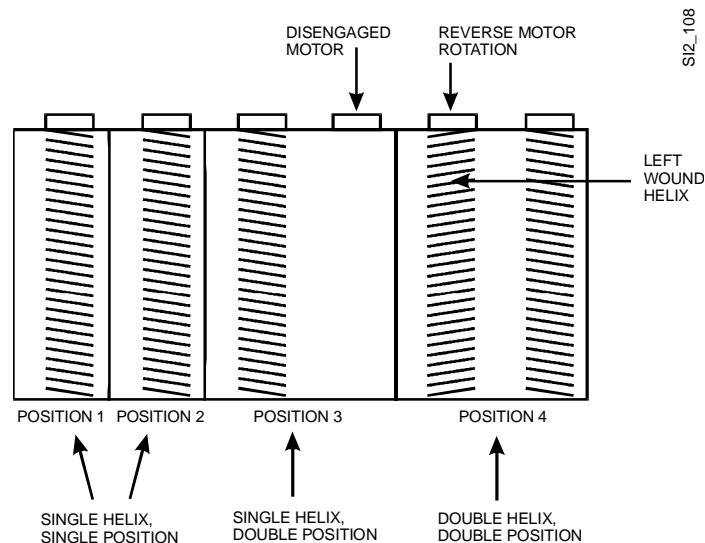


Figure 6-3 Possible Helix Configurations For Solids/Orals

6.3.2.5 Position Numbering

There are six dispensing positions that may be combined in various ways as described above. Combined positions are recognized by the system by the placement of jumpers on the controller CCA and, for some cases, reversing of motor drive. When combining positions, the system will renumber the positions in a logical ascending order (left to right).

Note

An injectable and solid/oral helix dispensing position can be combined on a helix shelf.

6.3.3 Injectable Helix Shelf

Injectable helix dispensing shelves are used to accept vials (from 1 mL to 6 mL) and ampules (from 1 mL to 5 mL) in lieu of using an injectable dispensing bin.

6.3.3.1 Standard Configuration

An injectable helix shelf can be configured as shown in Table 6-1:

Table 6-1 Injectable Helix Shelf Configurations

Med Package	Shelf Position Usage	Version 640 Capacity	Version 463 Capacity
1 mL, 2 mL, or 3 mL vial 1 mL or 2 mL ampule	1	12	10
5 mL or 6 mL vial	1	9	8
5 mL ampules plus 1 mL vial	2	9 12	8 10
5 mL ampule plus 2 mL or 3 mL vial	2	9 9	8 8

6.3.3.2 Position Numbering

There are six dispensing positions that may be combined in various ways as described above.

Refer to Kit instructions TM-INJHCH-000X (**Version 640**) or TM-INJHLX-000X (**Version 463**) for complete details in modifying a solids/orals shelf into an injectable helix dispensing configuration.

Note

Injectable and solids/orals helix dispensing positions can be combined on a helix shelf.

6.3.4 Front Door Security Lock and Position Switch

The UDM's front door is secured by a locking device that can be unlocked by either a key override or electronically from the DT. A sensing switch is provided to detect whether the door is open or closed. The **Version 640** has a new switch type. In this version, the microprocessor checks the state of the door switch. After receiving a command from the DT to pulse open the door, the microprocessor checks the door switch to determine whether the door is open or closed. If the door is already open, the microprocessor will not pulse the door lock solenoid. This inaction is intended to prevent annoying door solenoid plunging during restocking of the UDM. However, activation of the test switches will pulse the solenoid.

6.3.5 Lock I/O Requirements

The I/O requirements for the door lock and switch are handled by a controller located on the UDM I/O Controller CCA. This controller CCA is mounted on the inside back panel of the module cabinet and is in addition to the five UDM shelf mounted Dispensing Controller CCAs. This CCA also distributes the IB to the dispensing shelf controllers from the cabinet mounted IB rectangular connectors.

Therefore, all shelf controller CCAs connect to the I/O Controller CCA via a coiled IB cable.

6.3.6 Common UDM Shelf Configuration Items

The following paragraphs describe common hardware items associated with a shelf assembly that are independent of the shelf configuration.

6.3.7 Coiled Cables

Each shelf assembly controller CCA connects with the IB over an internal coiled cable. Since the shelf assembly can be extended from the module, the coiled cable style minimizes cable slack when the shelf is closed. A slacked cable could interfere with the operation of a lower shelf.

6.3.8 Internal IB Distribution

The IB is distributed from the two rear cabinet mounted connectors by separate wire harnesses to the UDM I/O Controller CCA. Five on-board modular connectors are used for coiled cable connection to the CCAs on each shelf.

The IB is routed from each of the back panel rectangular connectors by two 5-wire harnesses to the I/O controller CCA. These wire harnesses are terminated at the CCA with 6-pin header connectors and plug into J14 and J15. The modular connectors (J9 through J13) are connected to the controllers for the shelves via flat, coiled 8-wire cables.

6.3.9 I/O Controller CCA Functional Description

Refer to Figure 6-4 for a functional block diagram of the I/O controller CCA. This CCA has two purposes. One purpose is to provide a central distribution for the IB from the back panel rectangular connectors to each controller CCA on a shelf assembly. The UDM I/O Controller CCA provides connections between header connectors J14 and J15 to five modular connectors J9 through J13. The second purpose is to provide the I/O communication between the IB bus and UDM front door electronic lock and door position switch.

6.3.10 I/O Communication

The controller CCA has the capability to drive up to four locking mechanisms and to check for the position of the door as either open or closed.

The lock is solenoid operated and is connected to the CCA via a five wire cable to connectors J1 through J8. J1 through J4 provide the solenoid outputs and J5 through J8 are the switch inputs. On-board polyswitch current protection is provided for a stuck solenoid.

The CCA includes a microprocessor with a built-in system address. This address was permanently assigned to the microprocessor by its manufacturer and is unique. This address is recognized as the

controller address by the system. The device address is labeled on the microprocessor chip and cannot be changed. If the microprocessor chip is replaced, then the new address must be recorded in the system.

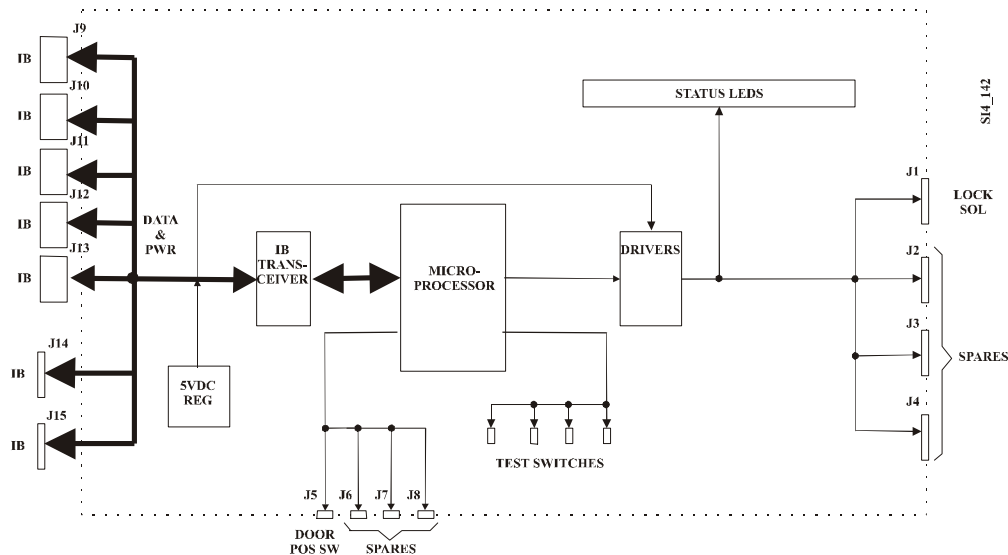


Figure 6-4 I/O Controller CCA Functional Block Diagram

The microprocessor directly controls unlocking operations as commanded by the DT over the IB. In firmware revision 3.01 and earlier, the output is activated independent of its associated input. In firmware revision 4.02, activation of the output is dependent upon its associated input (i.e., the door lock will not activate unless the door switch is indicating the door is closed). Activation of the lock at each solenoid output can also be performed manually by on-board test switches. These test switches are labeled SW1, SW2, etc., and respectively correspond to output ports J1, J2, etc. As shown in Figure 6-4, manual activation by the switches is controlled via the microprocessor. LEDs that indicate each solenoid output lights to show that activation power is applied to the solenoid, although this does not guarantee that an unlocking actually occurred. To verify an unlocking activation, it is necessary to observe the lock action.

Note

Test switches are independent of associated inputs.

6.4 General Replacement Procedure Prerequisite

Before replacing any components in the UDM, exit to the DT application and turn off the power.

6.5 Common UDM Replacements

Circuit card assemblies (CCAs) are not repairable and must be replaced as an item when found defective. All items that are associated

with the UDM and replaceable are covered in this section. Use standard procedures for returning defective parts.

6.5.1 Replacing Shelf Assembly (Injectable Bin or Helix)

Perform the following procedure to replace any type of shelf assembly:

1. Simultaneously depress the release levers on each side of the shelf assembly and pull the assembly to its fully extended position.
2. Release the detent and pull the shelf assembly out past its detent, but do not pull the shelf out of its slides. Unlock the “quick release” tie strap at the right of the shelf assembly to free the coiled IB cable to the CCA. Disconnect the cable (modular connector) from the CCA. **DO NOT CUT ANY OF THE PERMANENT TIE STRAPS.** It is not necessary to remove any permanent tie straps to remove a shelf assembly.



Use care when removing a shelf assembly so that the coiled IB cable is not stretched to its elastic limit. If the cable is over-stretched, it may obstruct a lower shelf assembly and interfere with a dispense. If a cable is stretched beyond its limit, it requires replacement.

3. Remove the shelf assembly from its slide.
4. Replacement is the reverse of removal. During replacement, make certain that the cable tie locator on the coiled IB is located at the quick release tie strap.

6.5.2 Replacing Key Lock

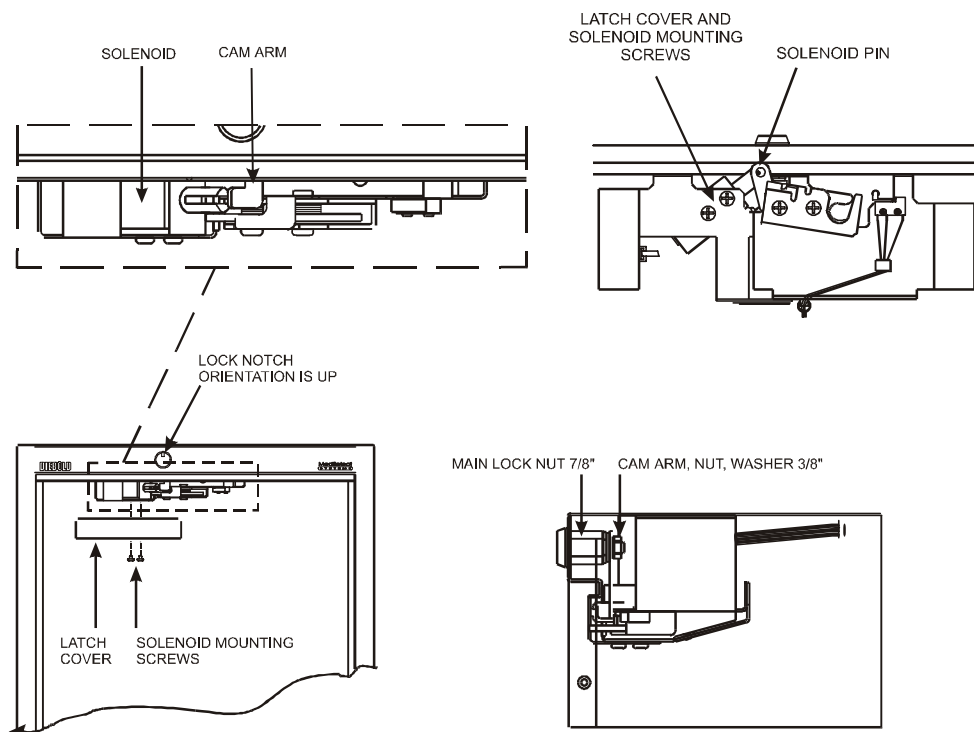
To change or replace a key lock, locking mechanism, solenoid, or microswitch, remove the top shelf assembly (and latch cover in **Version 463**). Also, the solenoid for the electronic latch must be disengaged from the latching mechanism. Latch disengagement can only be accomplished by removing the solenoid mounting screws. The key lock can then be removed by removing its cam arm and then the main body nut.



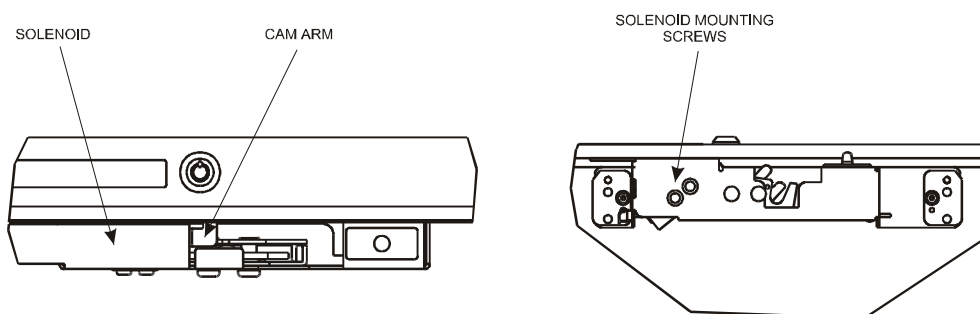
When working on the UDM locking mechanism (for example, when replacing a solenoid), manually press the latching arm closed so that the door cannot be inadvertently locked closed. If the door is closed while the solenoid is removed, it is impossible to unlock the UDM, even with a key. If this occurs, access can only be achieved by damaging the cabinet.

UDM lock details are shown in Figure 6-5. The step-by-step procedure to replace a UDM lock is as follows:

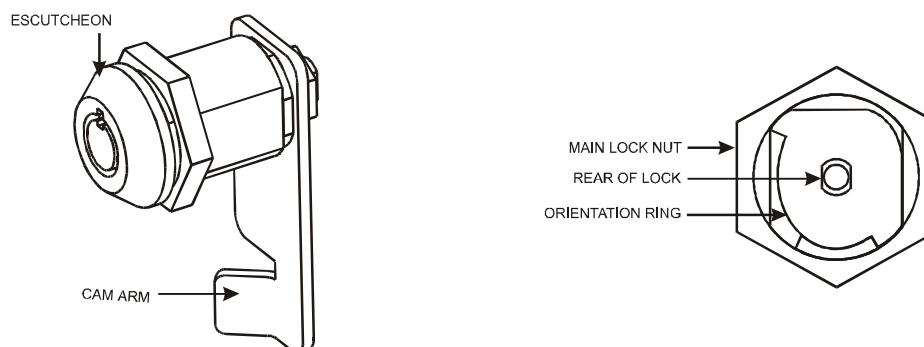
1. Open the UDM cover with the key or open it electronically from the DT Restock window. Consult the system administrator on which is preferred.
2. Remove the top shelf assembly as described in **Replacing Shelf Assembly** on page 77.
3. For **Version 463**, remove the latch cover (two Phillips head screws and lock washers). These screws also hold the solenoid.
4. For **Version 463**, disengage the solenoid pin from the latch. Push the solenoid back as far as possible for access clearance to the lock. For **Version 640**, it is only necessary to remove the screws holding the solenoid.
5. Reach up and behind the lock with a 7/16" socket and remove the cam arm nut and washer from the lock. Remove the cam arm.
6. Use a 7/8" deep well socket to remove the main lock nut.
7. Replacing a key lock is the reverse of removal. The following additional considerations assure correct lock installation:
 - a. If the orientation ring comes off, be sure to reinstall the orientation ring on the back of the lock for a clockwise unlocking direction as shown in Figure 6-5.
 - b. Install the lock so that the notch in its front escutcheon is facing up.
 - c. Install the main lock nut and cam (with nut and washer). Be sure to tighten the nut at 40 to 50 in-lb. A torque wrench is required.



VERSION 463



VERSION 640



VERSIONS 463 & 640

Figure 6-5 UDM Door Lock And Locking Mechanism

- d. Insert solenoid pin through latch and reinstall latch cover. The screws that secure the cover also hold the solenoid. Be sure that the latch cover is flush with the front lip of the cabinet.
8. Record the key number for the new lock on the customer's list of site key numbers. This list should be in the front of the customer's *AWS User's Guide* and should be stored in a safe place. Make sure each key has a key tag and the key tags are appropriately marked with the location and cabinet description.
9. Try the lock with its key before closing the UDM door. With the door still open, try to open the lock electronically from the DT Restock window.
10. Repeat Step 9 with the UDM door closed. If the UDM front door jams when closed, **access can only be achieved by damaging the cabinet.**

6.5.3 Replacing I/O Controller CCA

For this procedure, it is left to the discretion of service personnel whether or not to unmount the UDM and access the CCA by removing the UDM outside cover. However, in most cases, it is advisable to simply access the CCA through the front door as described in the steps above.

6.5.3.1 Removing UDM Cover (Optional)

The cabinet cover is secured by eleven Phillips-head screws along the rear edge and two Phillips-head screws along the front edge. The two top, front edge screws are only accessible when the front door is open. Also it is necessary to remove the strain relief tie for the electric lock and sensor switch. The strain relief is secured to a mounting screw on the UDM I/O Controller CCA. In lieu of clipping the tie strap, the strain relief clip may be removed from its mounting screw.

6.5.3.2 Accessing Controller

The UDM I/O Controller CCA is mounted on the upper left, inside back panel of the module. It is necessary to remove at least two of the top shelf assemblies and extend the third shelf assembly to gain access to the CCA.

Note

If a microprocessor is swapped out, use the AWS to update the controller address in the database server.

1. Remove the top two shelf assemblies and set them aside.



Use care when removing the shelf assembly so that the coiled IB cable is not stretched to its limit. If the cable is over-stretched, it may obstruct a dispense position and interfere with a dispense.

2. Remove all cabling to the CCA.
3. The CCA is held to the back panel of the drawer assembly by two Phillips head screws (with external lock washers) and two press standoffs. Remove the two screws and apply equal edge pressure to lift the CCA from the panel.
4. Replacing a CCA is the reverse of removal. Be sure to use equal pressure at the press standoffs when replacing the CCA. Then install the two mounting screws last. Be sure to reinstall the external lock washers. One of the lock washers is used to provide a good CCA-to-cabinet ground connection.

6.5.4 Replacing Coiled Cable

The coiled cables must extend without hanging between a shelf assembly and the UDM I/O Controller CCA. This is accomplished by attaching a section of the cable to the side panel of the cabinet. One section of a cable extends from a shelf assembly to the side panel attachment and the remaining section proceeds to the UDM I/O Controller CCA.

It is necessary to control the length of the cable segment between a shelf assembly and the side panel attachment. This control prevents the cable from hanging too low and contacting the lower shelf, which could interfere with the lower shelf's dispensing action. The control is provided by specifying a fixed number of coil loops between a shelf and the side panel attachment. The required number of loops for each shelf position is as follows, where shelf #1 is the top shelf:

Version 463:

Shelf #1: 18 loops
Shelf #2: 18 loops
Shelf #3: 19 loops
Shelf #4: 20 loops
Shelf #5: 20 loops

Version 640:

Shelf #1: 17 loops
Shelf #2: 17 loops
Shelf #3: 14 loops
Shelf #4: 17 loops
Shelf #5: 20 loops



Use care when removing a shelf assembly so that the coiled IB cable is not stretched to its elastic limit. If the cable is over-stretched, it may obstruct a lower shelf assembly and interfere with a dispense. If a cable is stretched beyond its limit, it requires replacement.

When replacing a coiled cable, be sure to strictly observe the coil count for its shelf position. The remainder of the coiled cable can be allowed to fall in the remaining segment.

6.6 UDM Injectable Dispensing Bin Shelf Servicing

Each shelf assembly can contain up to four removable bins for dispensing injectable containers. Different configurations are available. The text that follows assumes that the shelf is configured for four bins.

6.6.1 Injectable Dispensing Bin Description

Injectable bin dispensing is controlled by a solenoid that is built into the side of each bin. The sole purpose of the solenoid is to activate a gating mechanism for the injectable container dispensing.

Setup of a bin to accommodate a specific medication size is covered in the *MedSelect Restocker's Guide*.

6.6.2 Injectables Dispensing Bin Controller CCA Functional Description

Refer to Figure 6-6 for a functional block diagram of the injectables dispensing controller CCA. The purpose of this controller CCA is to control the dispense from a single bin type (vial, ampule, etc.) as designated by a command from the IB. The dispensing mechanism consists of a removable bin that holds medications. A solenoid operated gating mechanism opens momentarily to drop a single medication into a chute. There is no feedback to the system to indicate an actual dispense. On-board current protection (only polyswitches are provided on **Version 640**, but **Version 463** includes fuses) is provided for a stuck solenoid.

The CCA has the capability of driving four bins. The solenoid output drive is at connectors J1 through J4 (**Version 463** designation P1 through P4), and the IB input is at connector J11 (**Version 463** designation CON1). A small cable is used to make the connections between a bin and its solenoid output connector on the CCA.

The CCA includes a microprocessor with a built-in system address. This address was permanently assigned to the microprocessor by its

manufacturer and is unique. This address is recognized as the controller address by the system. The device address is labeled on the microprocessor chip and cannot be changed. If the microprocessor chip is replaced, then the new address must be recorded in the database by using the AWS.

The microprocessor directly controls the dispenses as commanded by the DT over the IB. Activation of the dispenses at each solenoid output can also be performed manually by on-board test switches. These test switches are labeled SW1, SW2, etc., and respectively correspond to output ports J1, J2, etc. (**Version 463** designations P1, P2, etc.) As shown in Figure 6-6, manual activation by the switches is still controlled by the microprocessor; the microprocessor is not bypassed. On Board LEDs that indicate each solenoid output will light to show that activation power is applied to the solenoid (but not that a dispense actually occurred). To verify a dispense, it is necessary to observe the dispense.

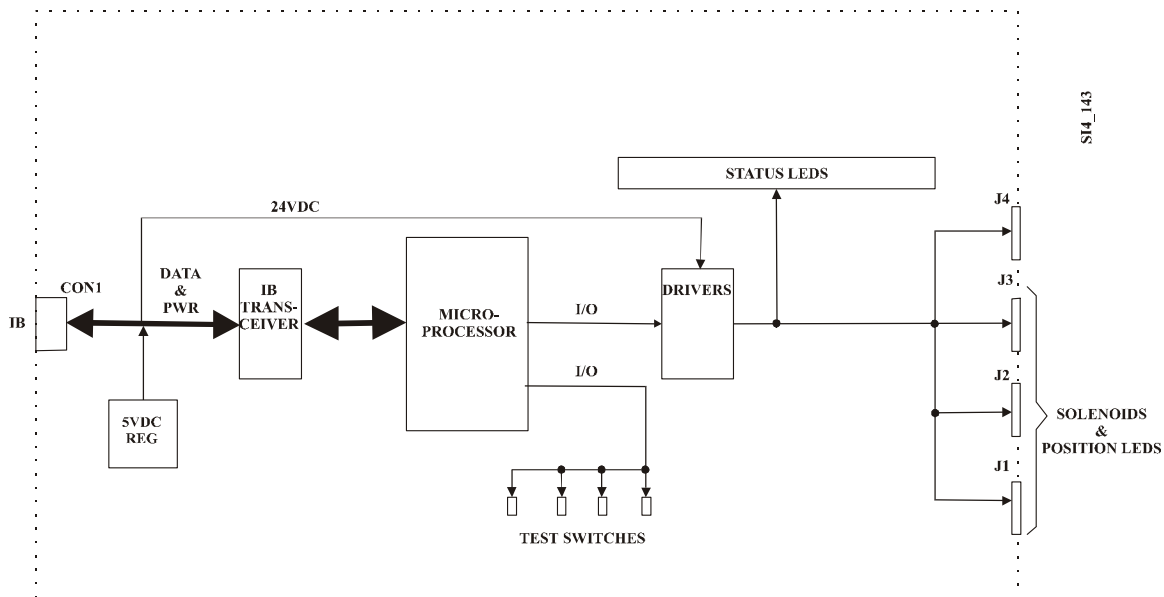


Figure 6-6 Injectible Dispensing Bin Controller CCA
Functional Block Diagram (**Version 640**)

6.6.3 UDM Version 640 Injectible Dispensing Bin Controller Upgrade

The latest version of the UDM (**Version 640**) has the following injectable shelf additions:

- Bin Restock (Position LED) Indicators
- Shelf Restock LED Indicator
- Diagnostic LED (DS5)
- Shelf Position DIP Switches

- Output Configuration DIP Switches
- Relocated Test Switches

6.6.3.1 Bin Restock LED

The bin restock LEDs are controlled by the microprocessor and are located on the solenoid cover of each bin. A lit LED indicates a bin position requiring a restock. This command is received from the DT and processed by the firmware in the microprocessor. Since an LED has been added to each bin, **Version 640** now uses a 4-wire cable for connecting a bin to the controller (two wires for the motor and two wires for the LED). However, a new version bin can be used on a **Version 463** controller CCA, but the LED will not be used. The 4-pin connector on **Version 640** and 2-pin connector on **Version 463** have identical pin spacing, which will allow interchange ability in either way (new bin with old version or old bin with new version). The user just needs to take care in offsetting the connector insertion to always use the solenoid connection.

6.6.3.2 Shelf Restock LED

The bin restock LED is not visible until the shelf is pulled out. Thus, to notify the user that a restock is required, an LED on an affected shelf is turned ON. Once this shelf is pulled out, the exact bin requiring a restock is known by the lit LED on its solenoid cover. There are still four LEDs located on the controller CCA for the same purpose. These LEDs light to indicate a pulsed solenoid position. The test switches also activate these on-board LEDs for each position.

6.6.3.3 Diagnostic LED

A single diagnostic LED is provided on the controller CCA and is used to monitor all four positions for errors. The LED also provides a "heart beat" flash every 10 seconds to indicate that the controller CCA is operational. As a diagnostic tool for tracing errors, the LED uses coded flashes. It is used to identify the bin position in error and whether its solenoid is open or shorted.

The microprocessor firmware always knows which solenoid position is being pulsed. A good pulse is one that actually causes a solenoid operation. A pulse is not good or in error whenever the solenoid winding is opened or shorted. Whether a pulse is good or in error as determined by the voltage drop over the polyswitch in the drive line. This voltage is compared with a reference by a comparator circuit and then processed in the microprocessor to produce a corresponding LED flash code pattern (good, opened, or shorted). It is always assumed that an opened solenoid exists until a good pulse is detected. A shorted solenoid error is dynamic and is only detected while the short exists.

Problem	Indication
Shorted Solenoid	N 250 ms pulses separated by 125 ms; where N is the solenoid position
Open Solenoid	N 1 sec pulses separated by 125 ms, where N is the solenoid position
None	Heartbeat pulses every 10 sec

For each solenoid position in error corresponding LED pulses are generated. LED errors patterns are sequenced from solenoid position 1 to solenoid position 4, with functional positions omitted.

6.6.3.4 On-Board Shelf Position DIP Switches

Three DIP switches of an 8-bank switch block are used to identify the shelf position in the UDM. These DIP switches are 5, 6, 7, and 8 in the bank. Switch 5 is always set to zero (off). The bin shelf can be located in any of the five positions. A table is silk screened on the controller board to assist in setting these DIP switches. The table is located adjacent to the DIP switches.

6.6.3.5 Output Configuration DIP Switches

Four DIP switches of an 8-bank switch block are used to identify the solenoid or bin position on the shelf that will be activated. These DIP switches are 1 through 4 in the bank. A table is silk screened on the controller board to assist in setting these DIP switches. The table is located adjacent to the DIP switches. Refer to the *MedSelect Restocker's Guide* for DIP switch setup.

6.6.3.6 Relocated Injectable Controller Test Switches

The test switches that were originally located adjacent to each solenoid connector have been relocated to the right side of the controller board. The purpose for relocating these switches was for easy accessibility without removing a bin. In **Version 463**, it was necessary to remove a bin to access its test switch. An extension cable was needed to reconnect the bin to the controller CCA for testing purposes. Refer to the *MedSelect Restocker's Guide* for DIP switch setup.

6.6.3.7 Replacing Injectable Dispensing Bin Shelf Assembly

Instructions for this procedure are provided in the **UDM Common Servicing Overview** on page 69.

6.6.3.8 Replacing Injectable Dispensing Bin

If a bin releasing mechanism is determined to be faulty, replace the entire dispensing bin. The method of removing an Injectable Dispensing Bin is shown in Figure 6-7.

Note

If a large bin on the right hand side is involved, be sure to replace 20 mL ampules with their large ends (bottom) towards the center (towards the left) of the assembly. This orientation of ampules minimizes the possibility of neck breakage.

Also, when replacing a left hand large bin, there may be some difficulty in connecting its solenoid cable. It has been found to be easier to connect this cable by first turning the bin partially clockwise from its normal position.

Perform the following procedure to replace a UDM Injectable Dispensing Bin:

1. Use the key to open the front door.
2. Simultaneously depress the release levers on each side of the shelf assembly that holds the Injectable Dispensing Bin and pull the assembly to its full extended position.
3. Release the shelf assembly cover at the front of the module by pulling it forward. Then swing the cover upward to its fully opened position. The cover is spring loaded.
4. Remove the contents of the Injectable Dispensing Bin that is being replaced. Be sure to lift the front of the Injectable Dispensing Bin to cause any items near the releasing mechanism to roll to the back of the Injectable Dispensing Bin where they can be removed.



The Injectable Dispensing Bins are unsecured in the shelf assembly when the assembly cover is opened. It is possible that bins could fall free of the shelf. Always remove all contents of bins before proceeding any further in this procedure.

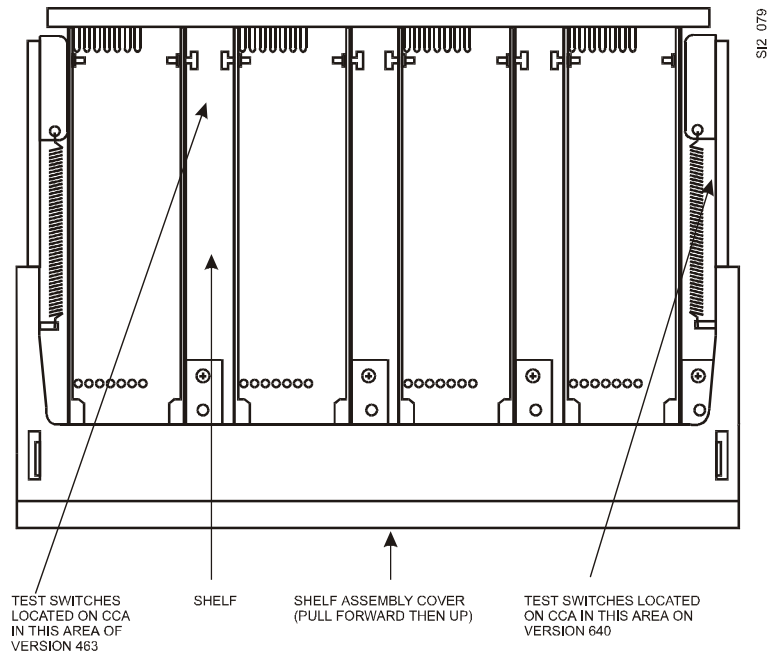


Figure 6-7 Replacing an Injectable Dispensing Bin

5. The Injectable Dispensing Bins rest on a lip of the shelf assembly. There is no additional attachment to the assembly, with the exception of the solenoid power cable (and LED cable for **Version 640**). The mating connector for this cable is located beneath the back end of the bin on the controller CCA. Lift the Injectable Dispensing Bin a few inches from the shelf to obtain access to the CCA solenoid connector (header type). **Make a note of the connection position for the solenoid power cable**, and then remove the cable from the controller CCA before completely removing the dispensing bin from the shelf assembly.
6. Replacing an Injectable Dispensing Bin is the reverse of removal. When replacing an Injectable Dispensing Bin, be sure to reconnect its solenoid power cable and replace all bin components, such as rollers and length guides. It is usually necessary to adjust the diameter guide height after replacement. Refer to the **Injectable Dispensing Bin Setup And Adjustment** in the *MedSelect Restocker's Guide*

6.6.3.9 Replacing Injectable Dispensing Bin Shelf Controller CCA

The controller CCA for each injectable dispensing shelf assembly is mounted at the rear of the shelf. It is necessary to remove all of the injectable dispensing bins for a shelf to gain access to the CCA.

1. Remove the dispensing bins as described under **Replacing Injectable Dispensing Bin** on page 85. The controller CCA is held to the shelf assembly by one Phillips head screw and five slotted posts. It is not necessary to remove the shelf assembly.

2. Disconnect the IB modular connector from the controller CCA. Remove the single mounting screw from the CCA (no washer), and slide the CCA to the left as far as possible. Then lift the CCA along with its plastic cover out of the shelf assembly.
3. Replacing a controller CCA is the reverse of removal. When mounting the CCA, be sure that the four posts are secured in their board slots before replacing the mounting screws. Also, be sure to replace the protective CCA cover.

6.6.3.10 Replacing Injectible Dispensing Bin Solenoid

Note

The bin solenoid is no longer considered a replaceable part. However, the disassembly procedure is maintained as it provides insight into its function for possible troubleshooting purposes.

Should a solenoid become defective, it can be easily replaced after the Injectible Dispensing Bin is removed from the shelf assembly. The method of removing a solenoid from a bin is shown in Figure 6-8.

1. Remove the Injectible Dispensing Bin.
2. Remove the cover over the solenoid by removing the two top screws. Then remove the two screws that hold down the solenoid. Be careful in lifting the solenoid free from the dispensing mechanism. The entire mechanism is also held in place by the two solenoid screws. If the entire mechanism pulls out, reset the mechanism back in place and make certain that the internal nylon washer (not provided on later units) is present on the rear (upper) gate pin. The washer is not provided on the front (lower) gate pin.

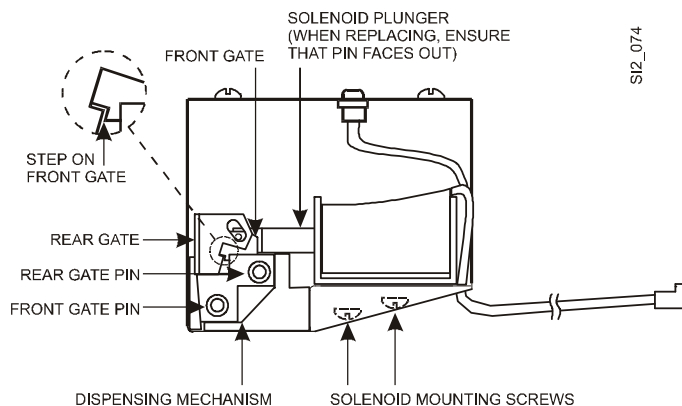


Figure 6-8 Replacing Injectible Dispensing Bin Solenoid (**Version 640**)

3. Replacing a solenoid is the reverse of removal. After engaging the solenoid plunger pin into the slots of the gates, check that the

plunger can be moved without any binding. It may be necessary to loosen the solenoid mounting screws and slightly reposition the solenoid.

Notice that there is a small step on the edge of the rear gate at the solenoid pin. This notch is intentional and prevents actuation of the gate, and therefore a dispense, by pressing on the front gate. When reinstalling the solenoid, be sure this function is operational by pressing on the front gate. The front gate must engage onto this step.

6.6.3.11 Setting Up and Adjusting Injectable Dispensing Bin

Refer to the **Injectable Dispensing Bin Setup and Adjustment** in the *MedSelect Restocker's Guide*.

6.7 UDM Solids/Orals/Injectables Helix Shelf Servicing

The helix dispensing shelf assembly is designed to be used in the UDM as a standard shelf assembly. Various configurations of shelf assemblies in a common UDM are available.

Each shelf assembly can contain up to six positions for orals or injectables packages. The text that follows assumes that six positions are used in each shelf assembly.

The dispenser consists of a single shelf assembly that is divided into permanent positions for storing different medications. A shelf assembly can consist of up to six positions. To accommodate large medications (lengthwise), the shelf assembly can be reconfigured by combining adjacent positions and by repositioning the dispensing mechanism. Reconfiguration of a shelf can be performed in the field by service personnel.

The user can perform the following procedures without the aid of service personnel:

- Adjust length guide
- Change helix to accept different medication capacities

Service personnel must perform the following procedures:

- Change shelf assembly to accept a different helix diameter
- Combine positions to accept larger medication sizes

6.7.1 Helix Dispensing Shelf Assembly Description

Dispensing is controlled by a motor that turns a helix one revolution to dispense a medication package from a position on a shelf. A motor and an index switch are the only electrical devices that are physically associated with each position. These electrical devices are connected to the controller CCA by plug-in leads.

Each shelf assembly contains its own controller that is capable of operating up to six positions. The controller is mounted near the rear of the shelf assembly and is accessible by extending the shelf. It is necessary to open the front door of the module and release two levers to extend a shelf. The dispensing action functions with the shelf assembly extended.

There are two setups that can be performed on a helix dispensing position. A position can be set up with different dispensing capacities and sizes by changing the helix. A position can be modified to accept wide packages by combining adjacent positions. The dispensing capacity (**Version 463**: 10, 15, or 20 and **Version 640**: 12, 18, or 24) can be changed by the user, but changes that require a helix of a different diameter must be performed by service personnel.

6.7.2 Helix Dispensing Controller CCA Functional Description

Refer to Figure 6-9 for a functional illustration of the helix dispensing controller CCA. The purpose of this controller CCA is to control the dispense of a single injectable or solid medication package as designated by a command from the IB. The dispensing mechanism consists of a helical coil that rotates to move the medication to the end until it drops off into a chute. An index switch for each position detects when the helix has made one revolution or one dispense movement.

Jumper sockets are provided on-board to configure helix drive positions to accommodate wider medication packages. There is no feedback to the system to indicate an actual dispense. On-board current protection in the form of polyswitch and electronic current limiting is provided for the motor drive circuit. All motors shut down if any motor should cause a prolonged over-current condition.

The CCA has the capability of driving up to six helixes. The motor output drives are at connectors J1 through J17, and the IB input is at connector J18. A small cable is used to make the connections between a drive motor (including its index switch) and its output connector on the CCA. Each motor position has the capability for reverse rotation to accommodate wide packages in a double-helix dispensing setup (except motor position 6 in **Version 640**). The motor connector must be physically moved to a position that supports opposite polarity.

The CCA includes a microprocessor with a built-in system address. This address was permanently assigned to the microprocessor by its manufacturer and is unique. This address is recognized as the controller address by the system. The device address is labeled on the microprocessor chip and cannot be changed. If the microprocessor chip is replaced, then the new address must be recorded in the system.

The microprocessor directly controls the dispenses as commanded by the DT over the IB. Activation of the dispenses at each solenoid output can also be performed manually by on-board test switches. These test switches are labeled SW1 - SW6 and respectively

correspond to motor positions 1-6. As shown in Figure 6-9, manual activation by the switches is still controlled by the microprocessor; the microprocessor is not bypassed. These test switches can also be used to reset a motor that is not properly indexed (for example, if a helix becomes jammed and the motor cannot complete its full rotation). For **Version 463**, on board LEDs tied to each motor drive output will light up to show that activation power is applied to the motor (but not that a dispense actually occurred). To verify a dispense, it is necessary to observe the dispense. LED DS7 flashes when the microprocessor resets. The LED stays ON solid when a position has an error.

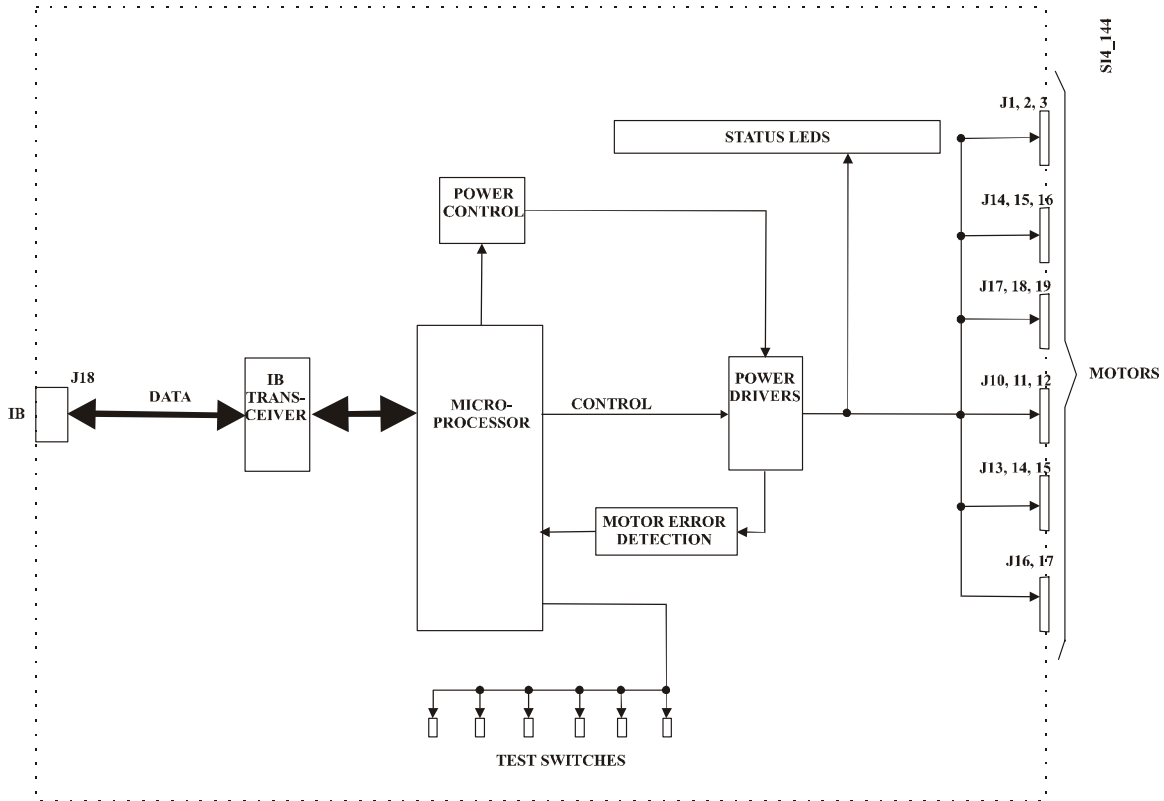


Figure 6-9 Helix Dispensing Controller CCA Functional Block Diagram

6.7.3 UDM Version 640 Helix Controller Upgrade

The latest version of the UDM (**Version 640**) has the following helix shelf additions:

- Position LED Restock (Position) Indicators
- Diagnostic LED (DS7)
- Shelf Position DIP Switches

6.7.4 Position Restock LEDs

The restock LEDs are controlled by the microprocessor and are located on a separately mounted CCA just beneath the front edge of the shelf. Each LED is positioned along the board to coincide with a dispense

position. A lit LED indicates a position requiring a restock. This command is received from the DT and processed by the firmware in the microprocessor.

6.7.5 Diagnostic LED

The diagnostic LED flashes twice during a microprocessor reset and power up. Under normal operation, the LED is off. However, a steady ON state indicates an error condition. The LED does not distinguish which position the error has occurred; it simply indicates an error is associated with the shelf. When the error is cleared, the LED will go off. The error is detected from the index switch. The index switch must count one revolution of the motor per dispense command. The index switch must rest in the shaft detent when the motor is not running.

6.7.6 On-Board Shelf Position DIP Switches

Three DIP switches are used to identify the shelf position in the UDM. The helix shelf can be located in any of the top four positions only. A table is silk screened on the controller board to assist in setting these DIP switches. The table is located on a clear area of CCA board, which is not adjacent to the DIP switches.

6.7.7 Helix Controller CCA Motor And Divider Jumper Sockets

Shelves are shipped with all six helix drive positions. However, adjacent positions can be combined to accommodate wide medication packages. In this situation, the firmware is informed of the modified configuration by installing jumpers in CCA sockets E1 through E11.

Odd numbered jumper socket positions E1, E3, E5, E7, E9, and E11 are called helix jumpers. They are installed to notify firmware that the associated motor(s) are not to be driven.

Even numbered jumper socket positions E2, E4, E6, E8, and E10 are called divider jumpers. They are installed to notify firmware that a corresponding permanent divider(s) has been removed and the associated helix motors must be driven at the same time.

Note

Disabled motors are not removed for dispensing position modifications. Only their helix couplers need to be removed.

When positions are combined, the firmware automatically renumbers all positions on the shelf. For example, if positions 1 and 2 are combined, the new position becomes position 1, the old position 3 becomes position 2, and so on to the last position.

Each helix jumper is located above its associated helix motor, and each divider jumper is located above its permanent divider. All jumper sockets are identified on the CCA.

Kits are available for combining adjacent positions. These kits include the necessary jumpers for performing the modifications. Jumpers are not stored on the CCA.

Two possible configurations that combine positions are briefly described below. Other multiple-position configurations can also be accommodated.

6.7.8 Single Helix Double Position (SHDP) Drive (Solids/Orals Only)

When adjacent positions are combined and use only a single helix to dispense, one of the helix motors is disabled by placement of a jumper at the motor position, and a jumper is placed at the position of the removed divider. The active motor is driven clockwise.

6.7.9 Double Helix Double Position (DHDP) Drive (Solids/Orals Only)

When adjacent positions are combined and use two helices to dispense, the helix next to the left hand divider is rotated counterclockwise and its helix is left hand wound. Neither motor is disabled, but a divider jumper must be installed to indicate both motors must be driven simultaneously. The counterclockwise orientation of the left hand motor causes the helix to turn against a length guide which must be placed at the next left hand slotted position to prevent “walking”. The motor rotation combined with the left hand wound helix provides a movement perpendicular to the direction of rotation towards the dispensing end.

6.7.10 Motor Reversing (Solids/Orals Only)

A motor is reversed so that it turns counterclockwise by moving its cable connection on the CCA to the opposite polarity connector. For example, to reverse the direction of the helix motor at position 1, move its cable connection from J1 to J2 (some early versions of the CCA used designations P1, P2, etc.). Likewise, for position 2, move its motor cable connection from J4 to J5 and so on for any other motor reverse rotation change.

As a summary, J1, J4, J7, J10, J13, and J16 are used for a clockwise (forward) motor rotation, and J2, J5, J8, J11, and J14 are used for counterclockwise (reverse) motor rotation. **A connector for a counterclockwise direction is not provided in position 6** because this motor is always at the right hand side of a position when combining positions.

6.7.11 Helix Diameter (Solids/Orals Only)

A helix with a different diameter than factory provided can be changed in the field by service personnel. When exchanging an existing helix

for one with a different diameter, it is necessary to reposition its drive motor and index switch.

6.7.12 Shelf Components Replacement Procedure Prerequisite

Before replacing any components in the UDM, exit the DT application and turn off the power.

6.7.12.1 Replacing Helix LED CCA

1. Pull the shelf assembly out past its detent, but do not pull the shelf out of its slides. Unlock the “quick release” tie strap at the right of the shelf assembly to free the coiled IB cable to the CCA. Disconnect the cable from the CCA.



Use care when removing the shelf assembly so that the coiled IB cable is not stretched to its elastic limit. If the cable is over stretched, it may lay in a dispense position on the next lower shelf assembly and interfere with an orals dispense.

2. Turn the shelf assembly over and place it on a work surface.
3. Disconnect the ribbon cable from the CCA.
4. Remove the CCA mounting screws (no washers).
5. Pop the CCA off its standoffs.

6.7.12.2 Replacing Helix Controller CCA

The controller CCA for each helix dispensing shelf assembly is mounted at the rear of the shelf. It is necessary to remove the shelf to gain access to the CCA. Be sure to remove all stored contents before proceeding with this procedure.

1. Pull the shelf assembly out past its detent, but do not pull the shelf out of its slides. Unlock the “quick release” tie strap at the right of the shelf assembly to free the coiled IB cable to the CCA. Disconnect the cable from the CCA. The controller CCA is held to the shelf assembly by two Phillips head screws and four slotted posts. Note that the controller CCA is mounted upside down.



Use care when removing the shelf assembly so that the coiled IB cable is not stretched to its elastic limit. If the cable is over stretched, it may lay in a dispense position on the next lower shelf assembly and interfere with a orals dispense.

2. Place the shelf assembly on a work surface.
3. Remove the CCA mounting screws (no washers).
4. Remove the three snap fasteners that hold the plastic cover to the CCA. The plastic cover and its fasteners are not included with a replacement CCA.
5. Remove the CCA from the shelf assembly by pulling the CCA slightly forward to release it from the chassis hooks on the back and sides edges.
6. Rotate the CCA to expose the cable connections for the motors and index switches (and helix LED CCA for **Version 640**, only).
7. For **Version 640**, disconnect the cable for the helix LED CCA first. Disconnect cable for index switches; then disconnect the motor cables from the controller CCA.
8. Replacing a controller CCA is the reverse of removal. When mounting the CCA, be sure that all hooks are engaged with the board before replacing the mounting screws. Install the mounting screws last. Also, be sure to reinstall the protective CCA cover.

6.7.12.3 General Helix Replacement Procedures

The following procedures are generic procedures that are referenced throughout the rest of this manual by more specific instructions for performing helix modifications and upgrades. It is only necessary to review these procedures when they are called out by a specific set of instructions.

6.7.12.4 Replacing Permanent Divider

A permanent divider is secured at the front (dispensing end) by a hook built into its lower edge, and by a Phillips head screw at the drive motor end. When reinstalling a divider, hook its front end first. Parallel end locations are identified on the shelf by black circles.

6.7.12.5 Unmounting Drive Motor

Each drive motor is held to the rear panel by three machine screws. These machine screws fasten into the gear housing.

Perform the following procedure to unmount a motor:

1. Remove the existing helix.
2. Remove the coupling by first removing its end screw. Then pull the coupling straight off the motor shaft.
3. Remove the three Phillips head screws that secure the motor to the back panel.

Note

When reinstalling helix motor mounting screws, do not over tighten.

6.7.12.6 Unmounting Index Switch

The index switch is held to the rear panel by two self-tapping screws. Use care when replacing these screws so that the plastic case of the switch is not broken.

6.7.12.7 Replacing Solids/Orals Dispensing Position Length Guide

A plastic length guide is provided for each position. The guide is installed in the appropriate slots of the position to accommodate different medication package widths. Always position the length guide as close as possible to the medications without causing a binding force. The guide prevents the packages from “walking” off the helix as it turns. Always be sure to install the guide in corresponding front and rear slots so that the guide is parallel with the position walls. Be careful not to select slots that may cause the packages to bind. Reference marks are provided on the shelf assembly label for the correct placement of the guide.

When installing a length guide, hook the guide into a front slot (dispense end) first. Then snap its other end into place in the corresponding slot so that the length guide is parallel to position walls. Some force is needed to snap the guide into place. Removal of a guide is the reverse of installing a guide. Be careful when unhooking the front of the guide from its slot.

6.7.12.8 Replacing Helix With Different Helix Capacity (Solids/Orals Only)

It is not necessary to remove the shelf assembly or unmount the drive motor when replacing a helix with one of the same diameter. The index switch does not interfere with this procedure.

Note

The 8, 10, 15, and 20 capacity helixes cannot be used on the 9, 12, 18, and 24 capacity shelves and vice versa.

6.7.12.9 Releasing Helix from Coupling

The helix is held to its drive coupling by a molded groove in the coupling and a helix retainer. The helix retainer is removed by pulling it straight out from its friction retainer at the drive motor end. Then the helix is lifted off of its coupling. A hook bent into the helix is used to lock the helix to the coupling.

Perform the following procedure to replace a helix:

1. Extend the shelf assembly from the module.
2. Empty any remaining medications from that position.
3. Grasp the end of the helix retainer and pull the helix retainer out of its end friction fastener. Remove the helix retainer from the helix. It may be necessary to use needle-nose pliers to accomplish this task.
4. Lift up the helix from the dispensing end to disengage helix from the coupling.
5. Remove helix from the position.

6.7.12.10 Attaching Helix to Coupling

Replace the helix in the reverse order of removal. Be sure to reinstall the helix retainer into the correct friction retainer at the motor end of the helix. The lower friction fastener hole is for a 1-inch helix diameter, and the higher hole is for the 1.4-inch diameter helix.

6.7.12.11 Replacing Helix with Different Diameter Size (Solids/Orals Only)

It is necessary to unmount the drive motor and index switch when replacing a helix with one of a different diameter. The associated permanent divider must be removed to obtain access to the mounting screws.

Perform the following procedure to replace a helix with one of a different size (diameter):

1. Release the helix from its coupling as described under **Releasing Helix From Coupling** on page 97.
2. Remove the helix retainer clip that is located immediately to the left of the helix position to be changed.

3. Remove the permanent divider as described under **Replacing Permanent Divider** on page 95.
4. Unmount the drive motor as described under **Unmounting Drive Motor** on page 96.
5. Unmount the index switch as described under **Unmounting Index Switch** on page 96.
6. Reposition the drive motor over the new hole-pattern in the rear panel and reinstall the three screws.
7. Install the coupling onto the drive shaft and install the center screw.
8. Install the index switch into the other hole set.
9. Replace the permanent divider.
10. Install the new diameter helix onto the coupling.
11. Reinstall the retaining clip into the correct friction retainer at the motor end of the helix. The lower friction retainer hole is for a 1-inch helix diameter, and the higher one is for the 1.4-inch diameter helix.
12. Use the CCA test buttons to manually test the position so that the index point is established.

6.7.12.12 Combining Adjacent Helix Dispensing Positions (Solids/Orals Only)

It is necessary to remove an adjacent permanent divider when combining positions. The drive motors of the two combined positions do not need to be unmounted unless they are mounted in the low or 1.0" helix diameter position. All combined positions use the 1.4" OD helix.

There are three standard configurations that can be implemented to accommodate a variety of medication sizes (additional configurations may be available):

- Single Helix Single Position (SHSP) (standard)
- Single Helix Double Position (SHDP)
- Double Helix Double Position (DHDP)

Perform the following procedure to combine two adjacent positions (DHDP):

1. Remove the two helix retainers from the left position.
2. Remove the two length guides by grasping the top rear tab, and then lifting this end straight up. The front of the guide is hooked

into the front slot (see **Replacing Solids/Orals Dispensing Position Length Guide** on page 96).

3. Remove the existing helix from the left most dispensing position drive motor (see **Replacing Helix With Different Helix Capacity** on page 96).
4. Remove the permanent divider from the position to the left. Remove the divider as described under **Replacing Permanent Divider** on page 95.
5. Make sure that both motors are mounted in the high position (see **Unmounting Drive Motor** on page 96).
6. Install the replacement double-wide permanent divider provided in the kit. Use the left mounting hole in the divider. Align the divider with the two cyan colored dots to the right.
7. Replace the helix just removed with the left-hand wound helix provided in upgrade kit. The left-hand wound helix must have the same diameter and capacity as the right hand helix (see **Replacing Helix With Different Helix Capacity** on page 96).
8. Reverse the direction of rotation of the left hand drive motor by connecting its cable to the reverse motor polarity socket on the controller CCA. (The controller CCA provides forward and reverse drive sockets for each drive motor. J1 is used for the forward direction, and J2 is used for reverse.)
9. Install the helix and divider jumpers onto the controller CCA (see **Helix Controller CCA Motor and Divider Jumper Sockets** on page 92).
10. Use the CCA test buttons to manually test the position so that the index point is established.

6.7.12.13 Replacing Injectable Helix Dispensing Positions

Note

When replacing a helix, it is also necessary to replace all parts with the kit supplied parts (i.e., do not just replace the helix).

Injectable helixes can be provided as a kit or an entire shelf that is added to an existing system.

6.8 UDM Troubleshooting

Use Table 6-2 to assist in troubleshooting common problems associated with the UDM in general.

Table 6-2 provides general troubleshooting that is applicable to all UDM configurations. Table 6-3 provides troubleshooting assistance for injectable configurations, and Table 6-4 provides assistance for orals configurations.

Table 6-2 UDM Troubleshooting

Symptom	Possible Causes
Dispensing operation of a shelf assembly does not function.	<ol style="list-style-type: none"> 1. Controller CCA for that shelf may be defective. 2. Modular cable from controller CCA to UDM I/O Controller CCA may be defective. Check modular cable by substitution. Replace modular cable. 3. UDM I/O Controller CCA may be defective. Check CCA by substitution.
UDM does not operate, but all other devices connected to the same DT are operational.	<ol style="list-style-type: none"> 1. IB cable to rear panel connector of module may be defective. Check all IB connections leading to and from the module for continuity. Replace the IB cable. 2. Internal wiring harness from rear panel connectors to UDM I/O Controller CCA may be defective. Check continuity of wiring harness. Repair harness as required.
Front door pops open on its own.	<ol style="list-style-type: none"> 1. The latch is not adjusted properly. Loosen the two screws on the latch. Push the latch back as far as you can. Retighten the screws while holding the latch in the new position.
Front door locking device does not unlatch when commanded from DT.	<ol style="list-style-type: none"> 1. Check solenoid connection to UDM I/O Controller CCA connector. 2. UDM I/O Controller CCA may be defective. Check CCA by substitution. 3. Check for jamming of mechanical locking mechanism.
Front door security breach is constant.	<ol style="list-style-type: none"> 1. Check sensing switch connection to UDM I/O Controller CCA connector. 2. UDM I/O Controller CCA may be defective. Check CCA by substitution.
Front door does not open electronically or by key.	Latch is jammed.
Meds are getting stuck between dispensing shelves and retrieval bin.	<ol style="list-style-type: none"> 1. Check for the Med Deflector Shield. If it is not present, order kit and install.

Table 6-3 UDM Injectable Dispensing Shelf Assembly Troubleshooting

Symptom	Possible Causes
An Injectable Dispensing Bin does not dispense but its LED flashes when a dispense command is received or its test switch is activated. All other dispensing bins on that shelf assembly are operational.	<ol style="list-style-type: none"> 1. Solenoid cable may be loose or defective. Visually check cable connection. Check for solenoid power at associated connector when test switch is activated. 2. Solenoid or releasing mechanism may be defective. Remove the solenoid cover and manually check the freedom of the releasing mechanism. If the solenoid is defective, it can be replaced. If the releasing mechanism is defective, the mechanism and solenoid are replaced as an assembly.
All Injectable Dispensing Bins on a shelf assembly do not function.	<ol style="list-style-type: none"> 1. Controller CCA for that shelf may be defective. 2. Modular cable from controller CCA to UDM I/O Controller CCA may be defective. Check modular cable by substitution. Replace modular cable. 3. UDM I/O Controller CCA may be defective. Check CCA by substitution.
Diagnostic LED flashes in a pattern. A bin does not dispense when commanded by the DT or corresponding test switch.	Bin solenoid is either opened or shorted. Refer to text (page 83) for specifics on interpreting the LED flashing pattern.
Injectable Dispensing Bin is dispensing all the meds at one time or none at all.	If Bin is dispensing everything at one time, the gate is set too high. If it is dispensing nothing at all, the gate is set too low. Use the Bin Adjusting Kit (one is shipped with each UDM) to adjust the gates.

Table 6-4 UDM Solids/Orals Dispensing Shelf Assembly Troubleshooting

Symptom	Possible Causes
The customer reports missed dispenses.	<p>This is often a configuration problem.</p> <ol style="list-style-type: none"> 1. Check to see if the meds are loaded properly in the helixes. See the <i>MedSelect Restocker's Guide</i> for details (customer should have this document). 2. Check to see if the helixes are turning true. If not, replace them. 3. Check to see if the length guides are inserted properly. They should not be at an angle. Check that the front and back marking match. 4. Check that the meds are the proper size for the helix they are in.
A helix dispensing position does not dispense but its LED flashes when a dispense command is received or its test switch is activated. All other dispensing positions on that shelf assembly are operational. Diagnostic LED remains ON steady.	<ol style="list-style-type: none"> 1. Motor cable may be loose or defective. Visually check cable connection. Check for motor power at associated connector when test switch is activated. Repair cable or replace motor. 2. Drive motor may be defective. Swap motor cable connection with a known active output from another position to check by substitution.
All helix dispensing positions on a shelf assembly do not function.	<ol style="list-style-type: none"> 1. Controller CCA for that shelf may be defective. 2. Modular cable from controller CCA to UDM I/O Controller CCA may be defective. Check modular cable by substitution. Replace modular cable. 3. UDM I/O Controller CCA may be defective. Check CCA by substitution.
Helix dispensing position does not shut down or continues past one revolution. Diagnostic LED remains ON steady.	<ol style="list-style-type: none"> 1. Index switch may not positioned correctly or may be defective. 2. Index cable may be defective. 3. Controller CCA for that shelf may be defective.
One or more positions do not dispense by DT command but functions properly with CCA test buttons.	<ol style="list-style-type: none"> 1. Possible index switch failure or CCA electronics. 2. Possible incorrect controller address being used at the DT or assigned in the database.

7. DM, CDM and MDM Servicing

The DM, CDM, and MDM consist of drawers that allow secured storage of items. The drawers are electronically locked until an unlocking command is received from the DT over the IB.

DM drawers are arranged in five drawer assemblies from top to bottom of the module.

A CDM is a reduced version of the DM, consisting of two drawer assemblies. Typically, the CDM is used in a large return/retrieve drawer configuration (F and G drawer assemblies), though other standard drawer configurations can be used.

An MDM is reduced further, and contains only one drawer assembly.

The following drawer assemblies are available for use in any DM, CDM, or MDM. Throughout this manual, drawer assemblies are referred to by their letter designation:

Assembly Type	Description
A	8 small drawers
B	4 medium drawers
C	1 large drawer
D	small return/retrieve plus 4 small drawers
F	large return drawer (requires a G assembly)
G	large retrieve drawer (requires a F assembly)

There are two version of DM, designated as **Version 1.0** and **Version 1.5**. The most obvious difference between these two types is the exterior lock configuration. **Version 1.0** DMs include a master or common lock in the upper right hand corner (when facing the front of the cabinet). **Version 1.5** modules do not have a master or common lock.

Functionally, the **Version 1.5** module includes drawer open sensors at the back of each drawer that did not exist in the **Version 1.0** module. Additionally, the CCA in a **Version 1.5** module will contain a row of DIP switches not found on the CCA in the **Version 1.0** module.

7.1 DM, MDM and CDM Distribution CCA Functional Description

The purpose of this CCA is to internally distribute the IB to the drawer assembly controllers. The CCA is mounted on the module rear inside panel near the bottom drawer assembly.

The drawer assembly in position 1 of the DM connects to J1 of the distribution board. The drawer assembly in position 2 of the DM connects to J2 of the distribution CCA and so forth for the remaining drawer positions. The controller CCA associated with the single drawer assembly for the MDM connects to J5 of the distribution CCA.

7.2 DM, MDM and CDM Controller CCA Description

Refer to Figures 7-1 and 7-2 for functional block diagrams of the **Version 1.0** and **Version 1.5** drawer controller CCAs, respectively. The main purpose of this controller is to activate a solenoid locking mechanism to release a spring-loaded drawer.

This controller CCA is similar to the UDM Dispensing Bin Controller CCA. The drawer controller CCA must drive eight solenoids to accommodate the possible eight-drawer configuration for a drawer assembly. For the **Version 1.5** controller, a drawer open-close detection is included and is implemented with magnet reed switches. There is no feedback to the system to indicate an actual opening on **Version 1.0** CCAs. On-board current protection in the form of polyswitches and a fuse is provided for a stuck solenoid.

Two DIP switch banks are provided on the version 1.5 controller CCA. These DIP switches are used as a means for identifying the drawer assembly configuration (i.e., drawer configurations A, B, C, etc.) and location of a drawer assembly position within a module. Set-up tables are provided on the board, next to the DIP switches.

The CCA includes a microprocessor with a built-in system controller address. This address was permanently assigned to the microprocessor by its manufacturer and is unique. The device address is labeled on the microprocessor chip and cannot be changed. If the microprocessor chip is replaced, then the new address must be recorded in the system.

The microprocessor directly controls drawer opening as commanded by the DT over the IB. The latest controller CCA also includes open/close detection feedback. Activation of a drawer at each solenoid output can also be performed manually by on-board DIP switches. DIP switch positions 1 to 8 correspond to solenoid outputs J1 to J8. A solenoid output is activated by flipping its corresponding DIP switch to its closed position. To activate the same position again, the DIP switch must be first flipped to its open position and lock must be latched (drawer closed). After performing tests with the DIP switches, the switches must be all returned to their original drawer assembly positions (see the Drawer Assembly Configuration table printed on the CCA), and the CCA must be power cycled by momentarily disconnecting the cable to J9 on the CCA. Manual action is controlled via the microprocessor. LEDs tied to each solenoid output will light to show that activation power is applied to the solenoid, but this does not guarantee that a drawer actually opened). To verify an actual drawer opening, it is necessary to observe the drawer.

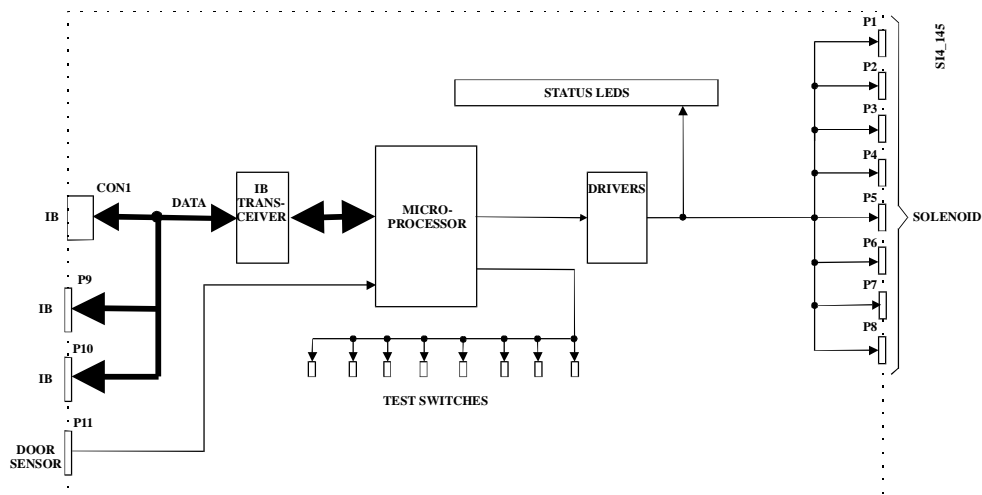


Figure 7-1 DM, MDM, CDM Controller CCA (Version 1.0)
Functional Block Diagram

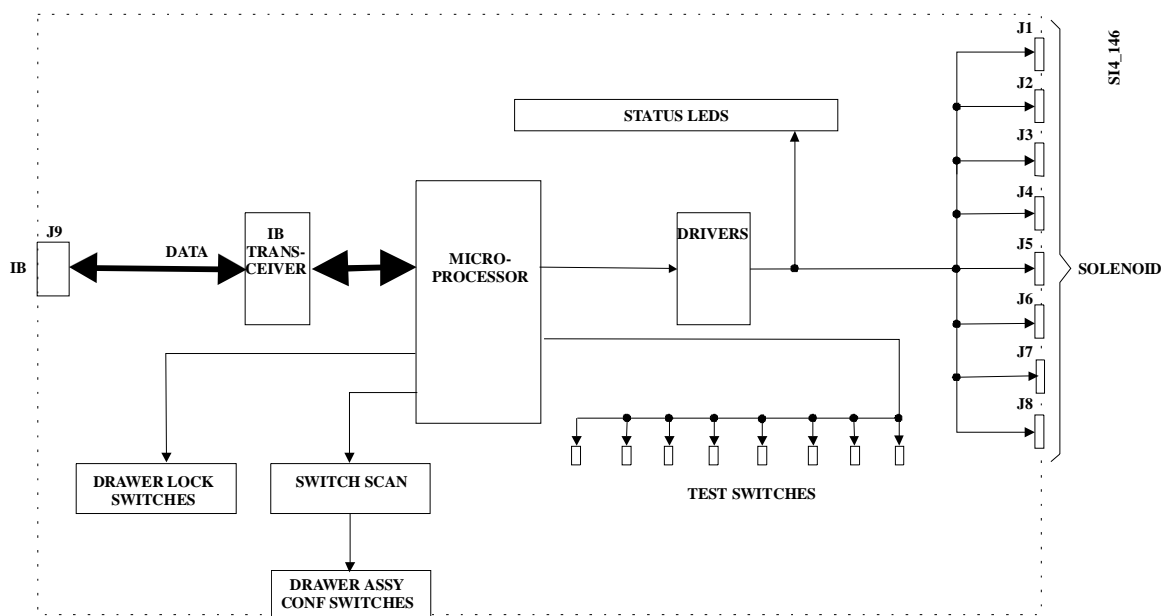


Figure 7-2 DM, MDM, CDM Controller CCA (Version 1.5)
Functional Block Diagram

7.2.1 Open/Close Sensor Reed Switches

All version 1.5 drawers are manufactured with a magnet attached to the end of its guide rail. When a drawer is closed, the corresponding reed switch is held closed by the magnet. When the drawer is opened, the magnet moves away from the reed switch and the reed switch opens.

The series output from reed switches SW9 through SW16 on each controller CCA is brought out at J9 (IB connection) of the IB modular

connector and routed via the IB cable to the distribution CCA for the module. The distribution CCA connects all drawer assembly reed switch outputs in series and provides a pin-out at J8 on the distribution CCA. Thus, all reed switches in the module are connected into one series string. The controller CCA can indicate that a drawer is open, but cannot indicate which particular drawer it is.

7.2.2 Controller CCA Setup for Drawer Assemblies

The drawer assembly in position 1 of the DM connects to J1 of the distribution CCA. The drawer assembly in position 2 of the DM connects to J2 of the distribution CCA and so forth for the remaining drawer positions. The controller CCA associated with the single drawer assembly for the MDM connects to J5 of the distribution CCA.

7.2.3 Controller CCA Setup for Large Return/Retrieve Drawer Assemblies

The bottom two drawer assemblies in a DM and the drawer assemblies of a CDM can be used for "F" (large return) and "G" (large retrieve) drawer assemblies. A CDM is a 2-position cabinet, which is essentially a smaller DM with only two drawer assembly positions. Although a CDM can use any of the available drawer configurations in its positions, it is often used for a large return/retrieve configuration, with an "F" drawer assembly on the top and a "G" drawer assembly on the bottom.

The position of both drawers is sensed by read switches and the solenoids are actuated to open. However, the top drawer only extends partially out when the solenoid is activated to expose only the deposit chutes. The top drawer is simply used as a secured chute to return meds into the retrieve drawer. The bottom drawer functions as a standard drawer where the solenoid unlatches the drawer so that it can be completely opened. This drawer must be secured since it holds returned meds.

The CCA connections used for a large return/retrieve drawer configuration are shown in Figure 7-3. The bottom CCA consists of an unpopulated controller CCA, with the exception of jumper connections and connectors J9 and J11. The CCA for the drawer assembly above the bottom CCA is used to activate the bottom position.

A special cable is used as the interconnection between J1 of the controller CCA (next to the bottom position CCA) and the solenoid of the bottom drawer assembly. Connector J11 is used as the interface connection between the CCAs for position sensing. When used in this configuration, all jumpers are installed on the controller CCA next to the bottom position controller CCA except E5, and all jumpers are installed on the bottom controller CCA except E1.

Note

All the drawer assembly configurations that a controller CCA can accommodate are given in a table printed on the board.

SI4_124

LEGEND: ■ INSTALLED BOARD JUMPER POSITION

□ UNINSTALLED BOARD JUMPER POSITION

NOTE: VIEW SHOWN FROM REAR OF CABINET

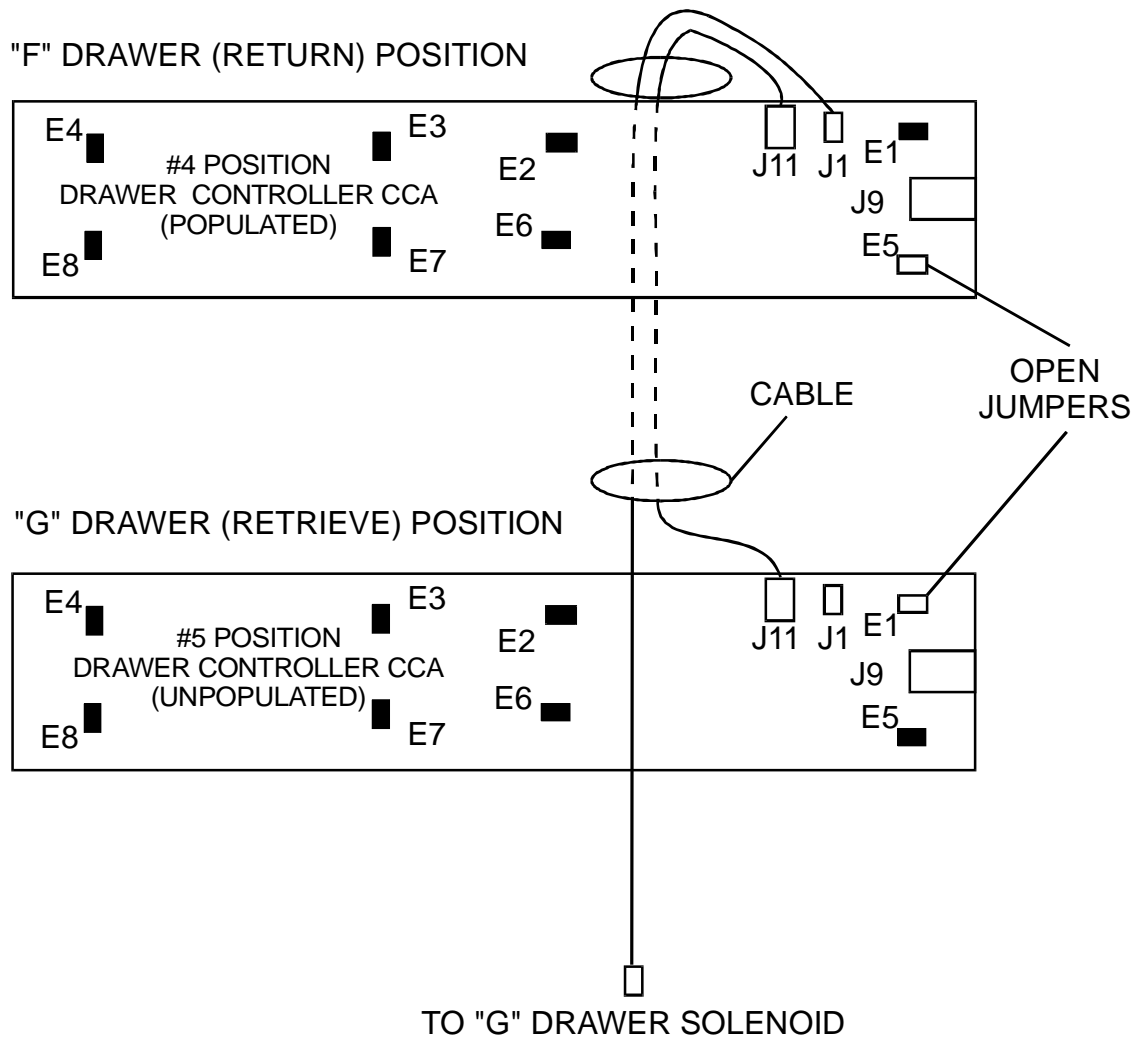


Figure 7-3 Large Return/Retrieve Drawer Configuration CCA Cable Connections

7.3 Special Notice for DM and SCM California Installations

The DM and SCM cabinets must meet certain code requirements when being replaced. The code pertains to specific floor mounting requirements. The method of mounting must be in accordance with the code requirements as specified by California's Office of Statewide Health Planning and Development (OSHPD) Facilities Development Division. Basically, these instructions install two front floor anchors, and change the two rear anchor types normally used in other installations. An addition of a floor mounting bracket to the cabinet base is needed to accomplish this installation.

Note

The MedSelect equipment as installed is categorized as fixed equipment in the California Building Code, Title 24, Part 2 and is for use in OSHPD 1 or OSHPD 2 facilities (these facility types as defined by the 1995 CBC, Title 24, Part 2, Section 101.17.13).

Pre-approval certification will be applied for in June 2000. Until certification is received, a local OSHPD representative must approve each installation as being compliant to local building code.

Mounting hardware: Hilti® HSL M 10/20 (Heavy Duty Sleeve Anchor) is ICBO approved (ICBO ER 3987).

7.4 DM Servicing Particulars

The DM is a secured cabinet that can only be accessed via key lock or electronically. Any other means of entering the cabinet will result in extensive physical damage.

7.4.1 Sticking Retrieve Drawers

If a small or large retrieve drawer becomes overfilled, the return drawer security flap (false bottom) may hang up on the retrieve drawer contents. The corrective action is to use the keys to open the return drawer. Then after the return drawer is opened, use a key to unlock the retrieve drawer and remove the medication overfill. Close the drawers. An accounting of the removed medication must be performed with authorized personnel.

7.4.2 Drawer Security Lock

Although drawers are electrically unlocked upon command, they can also be unlocked by using keys. A customer's key configuration can vary by site. Please ask the system administrator to provide any keys that may be needed.

7.4.3 DM Replacement Procedures

The DM is available with several drawer configurations, such as eight drawer, four drawer, etc. The drawer configuration will have no effect on the replacement procedures that may be required for servicing the module. These procedures apply to all drawer configurations.

The DM assemblies that are field replaceable are the drawer assembly, solenoid, and controller CCA.

7.4.3.1 Replacing Drawer Assembly

The drawer assembly is used to hold a set of drawers that are controlled by a single controller CCA. The controller CCA and electrical locking mechanisms, including the solenoids for each drawer, are located at the rear of each assembly. The controller CCA is mounted on the back panel of each drawer assembly. The CCA and solenoid can only be accessed by completely removing the assembly from the module.

Note

If a microprocessor is swapped out, the Database Server must be updated with the new controller address.

The drawer assembly can remain operational outside of its DM by using the extension cable provided in the service tool kit. The factory installed cable is not long enough for this purpose. The factory installed cable must be disconnected from the drawer assembly in order to remove the assembly. No other connections are needed to operate the assembly. The drawers, however, are unstable when the drawer assembly is not installed. Therefore, all drawers should be emptied and always removed from the drawer assembly before removing the assembly from the module.

To replace a drawer assembly, proceed as follows:

1. Unlock the drawers in the assembly using keys provided by the system administrator. All drawers of the drawer assembly should partially open.
2. Remove the drawers from the slides.

The unlocking lever for each drawer slide is located beneath its extended track. This lever is accessible when the drawer is pulled to its fully extended position. Note that the "D" and "F" drawers have only one locking lever on the right-hand slide.

Label the location of each drawer of the assembly. Make note which drawer is the far right drawer as its striker orientation is different than the other drawers. It must always be replaced in the far right location.

3. Remove the two DM mounting screws.

For an 8-drawer configuration, the screws are between drawers 6 and 8 as shown in Figure 7-4. A 1-drawer assembly uses four screws.

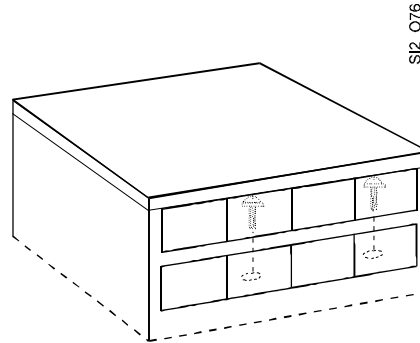


Figure 7-4 Replacing DM Drawer Assembly

4. The drawer assembly can now be removed from the module.
Replacing a drawer assembly is the reverse of removal. Be sure to connect the IB cable before replacing the assembly.

7.4.3.2 Replacing DM, CDM and MDM Drawer Assembly Key Locks

To change or replace a drawer assembly lock, it is always necessary to remove the associated drawer assembly to gain clear access to its locking mechanisms. It may be necessary to have on-hand the key for the lock. The step-by-step procedure to replace the common lock follows:

1. Unlock the drawers of the drawer assembly that need to be removed.

Unlock the drawers either electronically or by using a key. Consult the system administrator for a preference.

If a key is used, note that **Version 1.0** Drawer Modules require two keys: one for the top (common) lock, and one for the lock corresponding to the specific drawer assembly. **Version 1.5** modules have no top (common) lock, and therefore require only one key.

2. Remove the drawer assembly for access to the lock bolt (see **Replacing Drawer Assembly** on page 109 for specific instructions on removing a drawer assembly).
3. Remove the shoulder screws from the lock bolt, then disengage the lock bolt from the lock guide rod and lift the lock bolt from the cabinet.

A **Version 1.0** module will have 3 screws securing the lock bolt; a Version 1.5 module will have only 2 screws.

4. Pop the lock from the cabinet by unlocking with a key. Hold the key in its unlock position (clockwise direction) and pull the lock assembly from the cabinet. The lock assembly consists of the guide rod and spring. Be sure to retrieve the spring from the cabinet as it may be left behind when the lock is extracted.

Note

A replacement lock assembly does not include the guide rod and spring. These items must be reinstalled on the replacement assembly.

5. Replacing a key lock is the reverse of removal. When installing the lock, push in the lock so that the guide rod aligns with the lock bolt. Be sure that it engages with the guide rod of the lock assembly. Also, the mounting screws should allow free movement of the lock bolt.
6. If any of the remaining installed drawers of the assembly are open, press them close. First try the lock with its key to be sure that it turns. Then press the lock into its locking position while checking that the lock bolt moves the latch release bar on the drawer assembly to lock the installed drawers. Unlock the lock and check that all associated drawers open. If the drawers do not open, then a problem exists with the lock bolt operation.
7. Reinstall the removed drawers (or drawer assembly) and check the locking action of this assembly in the same manner as described in Step 5.
8. Record the key number for the new lock on the customer's list of site key numbers. This list should be in the front of the customer's *AWS User's Guide* and should be stored in a safe place.

7.4.3.3 Replacing DM, MDM and CDM Top Key Locks

To change or replace a top key lock, it is necessary to completely remove the top drawer assembly. It is also necessary to have on hand the key for the lock. Then, only two screws need to be removed from the master lock bolt of the locking mechanism (located at the right hand inside of cabinet). The step-by-step procedure to replace the common lock follows (refer to Figure 7-5):

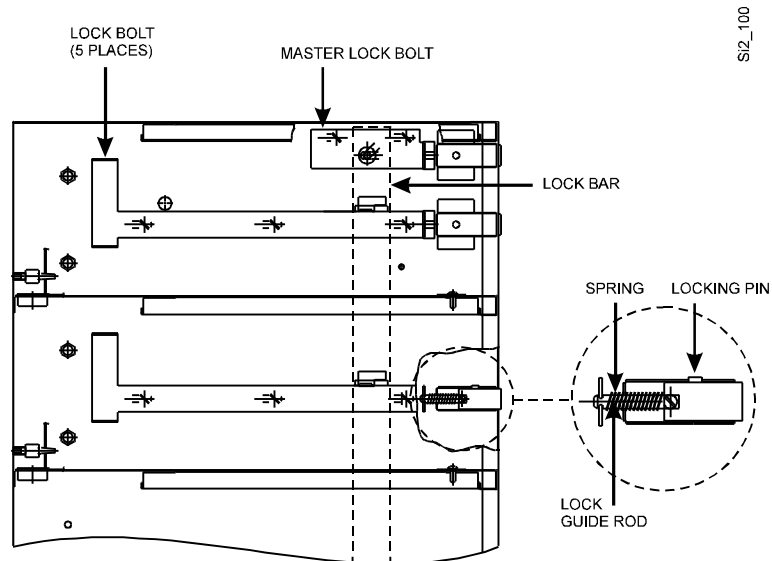


Figure 7-5 DM (CDM and MDM) Door Lock And Locking Mechanism

1. Remove the top drawer assembly as described in **Replacing Drawer Assembly** on page 109.
2. Remove the two shoulder screws from the master lock bolt. Disengage the lock bolt from the lock guide rod and lift the lock bolt from the cabinet.
3. Pop the lock from the cabinet by unlocking with a key. Turn the key in clockwise direction to unlock and pull the lock assembly from the cabinet. The lock assembly consists of the guide rod and spring. Be sure to retrieve the spring from the cabinet as it may be left behind when the lock is extracted.

Note

A replacement lock assembly does not include the guide rod and spring. These items must be reinstalled on the replacement assembly.

4. Replacing a key lock is just the reverse of removal. Do not replace the shelf assembly yet. When installing the lock, push in the lock so that the guide rod aligns with the lock bolt. Be sure that it engages with the guide rod of the lock assembly. Also, the shoulder screws should allow free movement of the lock bolt.
5. First try the lock with its key to be sure that it turns. Then press the lock into its locking position while checking that the lock bolt moves the lock bar up. Unlock the other drawers to determine that the lock bar is securing these drawers closed. If the drawers open, then a problem exists with the bar operation.

6. Reinstall the top drawer assembly and check the top lock locking action of this assembly in the same manner as described in Step 5.

7.4.3.4 Replacing DM, MDM and CDM Drawer Assembly Key Locks

To change or replace a drawer assembly lock, it is always necessary to remove the associated drawer assembly to gain clear access to its locking mechanisms. It is necessary to have on hand the key for the lock. Then, only three shoulder screws need to be removed from lock bolt of the locking mechanism (located at the right hand inside of cabinet). The step-by-step procedure to replace the common lock follows (refer to Figure 7-5):

1. Unlock the top (common) lock; then, use a key or electronically (login necessary) unlock the drawers of the drawer assembly. Remove the drawer assembly for access to the lock bolt (see **Replacing Drawer Assembly** on page 109).
2. Remove the three shoulder screws from the lock bolt. Disengage the lock bolt from the lock guide rod and lift the lock bolt from the cabinet.
3. Pop the lock from the cabinet by unlocking with a key. Hold the key in its unlock position (clockwise direction) and pull the lock assembly from the cabinet. The lock assembly consists of the guide rod and spring. Be sure to retrieve the spring from the cabinet as it may be left behind when the lock is extracted.

Note

A replacement lock assembly does not include the guide rod and spring. These items must be reinstalled on the replacement assembly.

4. Replacing a key lock is just the reverse of removal. When installing the lock, push in the lock so that the guide rod aligns with the lock bolt. Be sure that it engages with the guide rod of the lock assembly. Also, the shoulder screws should allow free movement of the lock bolt.
5. If any of the remaining installed drawers of the assembly are open, press them close. First try the lock with its key to be sure that it turns. Then press the lock into its locking position while checking that the lock bolt moves the latch release bar on the drawer assembly to lock the installed drawers. Unlock the lock and check that all associated drawers should pop open. If the drawers do not open, then a problem exists with the lock bolt operation.
6. Reinstall the removed drawers (or drawer assembly) and check the locking action of this assembly in the same manner as described in Step 5.

7.4.3.5 Replacing DM Solenoid

If a locking mechanism (mechanical) on the drawer assembly is determined to be faulty, replace the entire drawer assembly. If only the solenoid is found to be faulty, it can be replaced.

The method of removing a solenoid is shown in Figure 7-6. To replace a solenoid, proceed as follows:

1. Remove the drawer assembly as described under **Replacing Drawer Assembly** on page 109.

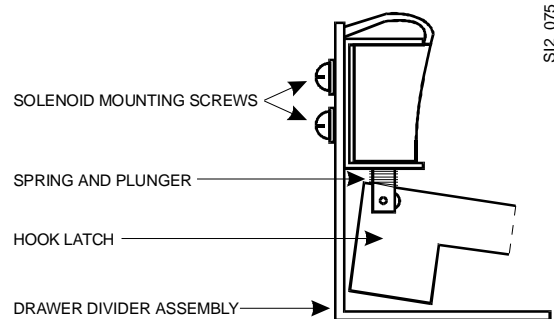


Figure 7-6 Replacing DM Solenoid

2. If the solenoid is located on the drawer assembly base (the lower row of drawers) in an "A" or "D" drawer configuration, then remove the drawer divider assembly (for the top row of drawers). It is also necessary to remove the controller CCA since it is physically mounted across the divider assembly. (It may be necessary to remove the anti-fish brackets for the A-, B-, and C-size drawer assemblies).
3. Disconnect all cables (IB and solenoids) to the controller CCA. Remove the controller CCA from the back of the drawer assembly. Remove eleven Phillips-head screws to remove this assembly.
4. Remove the solenoid power cable from the controller CCA.
5. Remove the two Phillips-head screws that hold down the solenoid.
6. Lift the solenoid upward and off of the hook latch. The plunger will remain behind. The spring is loose on the plunger and, thus, can be easily lost.
7. Replacing a solenoid is the reverse of removal. After inserting the solenoid plunger into the solenoid coil (be sure spring is present), check that plunger can be moved without any binding. It may be necessary to loosen the solenoid mounting screws and slightly reposition the solenoid coil.

7.4.3.6 Replacing DM Controller CCA

The controller CCA for each drawer assembly is located on the back panel of its drawer assembly. It is necessary to remove the drawer assembly to gain access to the CCA.

1. Remove the drawer assembly as described under **Replacing Drawer Assembly** on page 109. Disconnect the modular connector and all solenoid power header connectors from the controller CCA.
2. Remove the controller CCA.

For a **Version 1.0** module, the controller CCA is held to the back panel of the drawer assembly by four hex nuts (use a 1/4" socket driver). Remove the hex nuts and lift the CCA from the panel.

For a **Version 1.5** module, the controller CCA is snap-mounted.

3. Replacing a controller CCA is the opposite of removal.

When reconnecting the solenoid power cables, be sure they are connected to their proper connector designation on the CCA. Also, make certain the DIP switch settings on the new CCA match the settings on the old CCA, unless the drawer assembly has been replaced with a different drawer configuration.

7.5 MDM and CDM Servicing Particulars

Functionally, the MDM and CDM are identical to the standard sized DM. Any of the standard drawer configurations can be used in these modules.

The internal IB distribution is performed by the Distribution CCA. The Distribution CCA includes modular connectors for mating with the internal IB modular cables from the individual controller CCAs and two rectangular connectors (parallel connected) for mating with an external IB cable. These connectors are accessible at the rear of the module via the usual cutout provided in a module back panel. The external appearance of the IB connectors is identical to that of the standard DM. The entire assembly, which includes the Distribution CCA and cutout bracket, is called the connector panel assembly.

7.5.1 MDM/CDM Cable Termination

The internal cable of the controller connects to the J4 modular connector on the distribution CCA for a CDM, or J5 for an MDM. This distribution CCA is the same one used for the DM. The on-board track connects J1 through J5 in parallel with the two rectangular connectors (J6 and J7).

7.5.2 Replacing MDM/CDM Drawer Assembly

A drawer assembly is replaced in the same manner as described for a standard DM under **Replacing Drawer Assembly** on page 109.

7.5.3 Replacing DM or CDM Large Capacity Return/Retrieve Drawers

The CDM is designed to provide large drawer return/retrieve capability for meds. The return drawer is designated as an “F” size drawer and the “G” size designation is applied to the retrieve drawer. Thus the “F” drawer is always located above the “G” drawer in the module configuration. These are full size drawers that each take up a full drawer assembly position in the module.

Return and retrieve drawers are always used together. When they are used in a DM, they can only occupy assemblies #4 and #5, since a drop through hole is only provided between these two positions. When these positions are used for a different drawer configuration, a hole cover is installed. The CDM only has two assemblies, so a large return/retrieve configuration occupies the entire cabinet.

It is imperative that ampules always be deposited down the left chute of the return drawer and all other meds are deposited down the right chute. This requirement, including the correct orientation of ampules, is labeled on the chute.

There are two situations of replacement:

- To remove an “F” drawer, remove the “G” drawer first.
- To remove a “G” drawer, open the “F” drawer first.

The actual removal details for the two above situations are described in the following paragraphs. Once the drawer is removed, then its entire drawer assembly can be removed.

7.5.4 Replacing Large Capacity Retrieve Drawer (“G” Size)

To replace a “G” drawer assembly, proceed as follows:

1. Open the “F” drawer with the key lock. This action is needed so that the security flaps do not get in the way when removing the “G” drawer.
2. Release the slide unlocking lever. The levers are accessible when the drawer is fully extended.
3. Pull the drawer straight out and off its slides.
4. Make an accounting of all removed contents.
5. If the “F” drawer was not previously removed, simply replace the “G” drawer in the reverse order of removal. Use care when sliding the drawer under the security flaps.

If the “F” drawer was previously removed, reinstall the three springs (see **Replacing Large Capacity Return Drawer** on page 117) that are used to hold the flaps in position. Then slide in the “G” drawer.

7.5.5 Replacing Large Capacity Return Drawer (“F” Size)

Refer to Figure 7-7 for the spring arrangement used to hold the security flaps closed on an “F” drawer.

To replace an “F” drawer assembly, proceed as follows:

1. Remove the “G” drawer first as described under **Replacing Large Capacity Retrieve Drawer** on page 116.

2. After removal of “G” drawer, remove the three springs that hold the security flaps in place. The springs are accessed through the “G” drawer opening. These are flat springs and, thus, can cause cuts. Use care in withdrawing these springs.

The springs are removed one at a time, by first opening (slight movement only) a spring away from its mounting surface. Then use a small screwdriver to force the spring down. When removal is correctly performed, the spring will snap away from its mounting. Use care as a spring could eject with considerable force.

3. Release the slide unlocking lever of the “F” drawer. Each rail has an unlocking lever, but on later versions the left lever is disabled. Thus, on these versions only the right lever needs to be released. The levers are accessible when the drawer is fully extended.
4. Pull the “F” drawer straight out and off its slides.
5. Reinstall the drawer by sliding it back onto its slides while lifting up on the security flaps.
6. Reinstall the three springs by snapping them onto their holder. Be sure the springs lay underneath the security flaps. There are small index indents on the mounting plate to aid locating the mounting positions without visual contact.
7. Replace the “G” drawer as described under **Replacing Large Capacity Retrieve Drawer** on page 116.

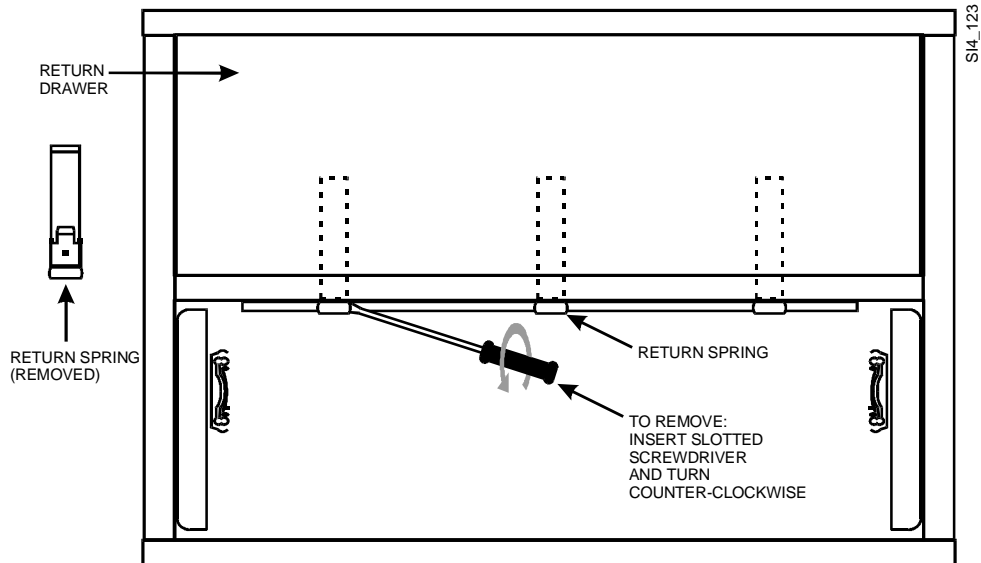


Figure 7-7 Large Capacity Return/Retrieve Drawer Security Flap Springs

7.5.6 Replacing DM And CDM Panel

The panel is used to cover the opening manufactured in the divider between the #4 and #5 drawer assembly positions of a DM and #1 and #2 positions of a CDM. The panel is only used when a large capacity return/retrieve configuration is not used. Because of the existence of the hole, the #4 and #5 positions for a DM and #1 and #2 positions for a CDM are the only positions a large capacity return/retrieve configuration can be installed.

Refer to Figure 7-8 for details on replacing the hole cover.

To replace a hole cover (plug), proceed as follows:

1. Remove only the drawers (not the drawer assemblies) from the #4 and #5 positions for a DM or #1 and #2 positions for a CDM. Remove the "F" (return drawer) and "G" (retrieve drawer) as described under **Replacing Large Capacity Retrieve Drawer** on page 116 and **Replacing Large Capacity Return Drawer** on page 117, respectively.
2. Remove the mounting screws from the panel through the "F" drawer opening.
3. Pull down and disengage the panel through the "G" drawer opening.
4. Reinstall in the reverse manner.

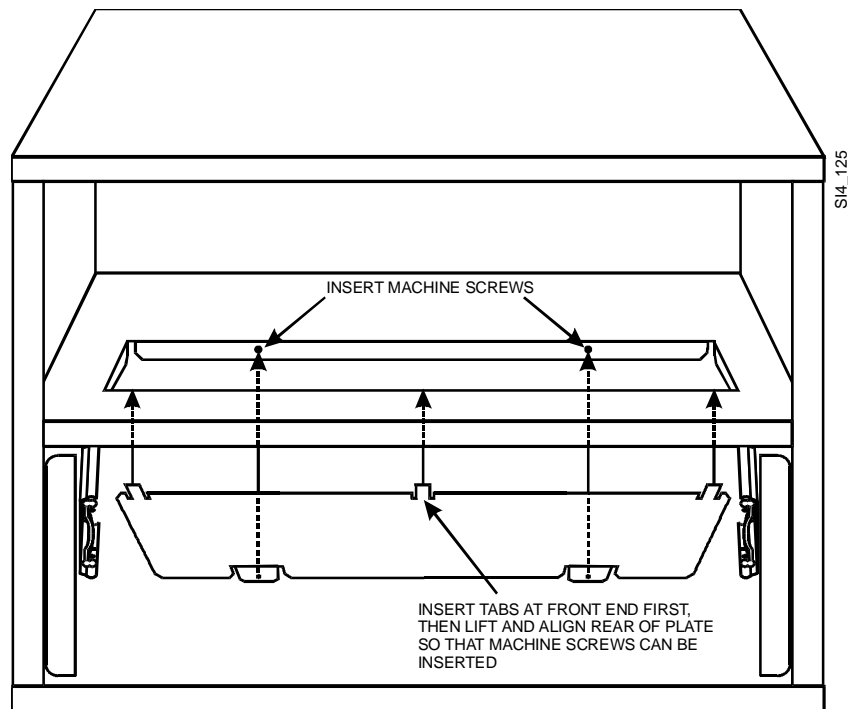


Figure 7-8 Panel Details For Drawer Assembly Positions
Large Capacity Return/Retrieve Drawers

7.5.7 Replacing Distribution CCA

The connector panel assembly is fastened to the DM by two screws. It is necessary to remove the lowest two drawer assemblies to obtain clear access to the connector panel. The assembly is removed from the front of the module. The internal IB cables are long enough to allow disconnection from the front of the module after unfastening the panel assembly.

Replace a connector panel assembly as follows:

1. Remove the lowest two drawer assemblies.
2. Remove all cabling from the distribution CCA.
3. Using a Phillips-head screwdriver, reach through the opened front of the module and remove the distribution CCA.
4. Remove the CCA from the front of the module.
5. Replace the distribution CCA in the reverse order of removal.

When reconnecting the cables, be sure they are connected to their proper connector designation on the CCA. Also, make certain the DIP switch settings on the new CCA match the settings on the old CCA, unless the drawer assembly has been replaced with a different drawer configuration.

7.6 DM, MDM and CDM Troubleshooting

Use Table 7-1 to assist in troubleshooting common problems associated with the DM, MDM and CDM.

Table 7-1 DM, MDM and CDM Troubleshooting

Symptom	Possible Causes
A drawer does not unlock but its LED flashes when a command is received or its test switch is activated. All other dispensing bins in that shelf assembly are operational.	<ol style="list-style-type: none"> 1. Solenoid cable may be loose or defective. Visually check cable connection. Check for solenoid power at associated connector when test switch is activated. Repair cable or replace solenoid. 2. Solenoid or releasing mechanism may be defective. Remove the drawer assembly, but do not disconnect the modular cable (i.e., leave it operational). Manually check the freedom of the locking mechanism. If the solenoid is defective, it can be replaced (plunger remains with locking mechanism). If the locking mechanism (mechanical) on the drawer assembly is defective, the entire drawer assembly must be replaced.
No drawers from one drawer assembly operate, but drawers from another assembly in the same DM do operate.	<ol style="list-style-type: none"> 1. Controller CCA for that drawer may be defective. 2. Modular cable from controller CCA to wiring harness may be defective or harness splice may be defective. Check continuity of cabling. Replace modular cable and/or repair cable harness. Note that the modular cables are a part of the harness assembly. The harness and modular cabling can be replaced as an assembly.
DM does not operate, but all other devices connected to the same DT are operational.	<ol style="list-style-type: none"> 1. IB cable to rear panel connector of module may be defective. Check all IB connections leading to and from the module for continuity. Replace the IB cable. 2. Internal wiring harness from rear panel connectors to controller CCAs may be defective. Check continuity of wiring harness. Repair harness as required. The harness can be replaced as an assembly.

8. ELC Servicing

The unit is a standalone module within the MedSelect System, thus it includes its own controller for communicating with the IB. If the module is determined to be defective, the entire unit must be replaced.

The controller includes a second modular feed-through to permit connection to another controller (any MedSelect System controller device).

8.1 ELC CCA Functional Description

Refer to Figure 8-1 for a functional illustration of this controller CCA. The purpose of the controller is to activate the unlocking mechanism solenoid. The solenoid in the ELM is of the magnetic latching type and is only operated momentarily. The solenoid used for the SCM is not a magnetic latching type, but is spring returned.

When a solenoid-activation is initiated by the system, an associated LED on the ELC lights green and forward power is pulsed to the solenoid, unlocking the device. When the lock is closed by the user, the same LED lights red.

The single controller CCA is ported at J1 through J8 for operating up to eight locking mechanisms. On board test switches are provided for local maintenance activation of any output (with LED indication). Lock action sensing input (acknowledgment to microprocessor) is provided for all outputs. The lock solenoid is pulsed with a bipolar pulse (positive then negative voltage) to provide unlocking action. The IB connections are at connectors J9 and J10.

The CCA includes a microprocessor with a built-in system address. This address was permanently assigned to the microprocessor by its manufacturer and is unique. This address is recognized as the controller address by the system. The device address is labeled on the microprocessor chip and cannot be changed. If the microprocessor chip is replaced, then the new address must be recorded in the system.

The microprocessor directly controls lock operation as commanded by the DT over the IB. Activation of a lock at each solenoid output can also be performed manually by on-board test switches SW1 to SW8 (corresponding to solenoid outputs J1 to J8). Manual action is also controlled via the microprocessor. LEDs tied to each solenoid output will light to show that activation power is applied to the solenoid (but not that an unlock action has actually occurred). To verify an unlocking action, it is necessary to observe the lock.

Note

A two-finger operation is required to activate a manual output. Each test switch must be activated in coincident with switch SW9. This switch is deliberately shielded by a small compartment on the cover when closed. This shield prevents possible operation of the test switches through connector openings on the case.

The same controller CCA is used for the supply cabinet (SCM) electronic lock. This lock, however, is not the retrofit lock covered in this description. Rather, the lock used on the supply cabinet is identical to the UDM electronic lock. This electronic lock only requires a positive voltage level to cause unlocking action. In this case, the controller CCA still generates a bipolar pulse, but a diode in the cable for the supply cabinet allows the current to bypass the solenoid.

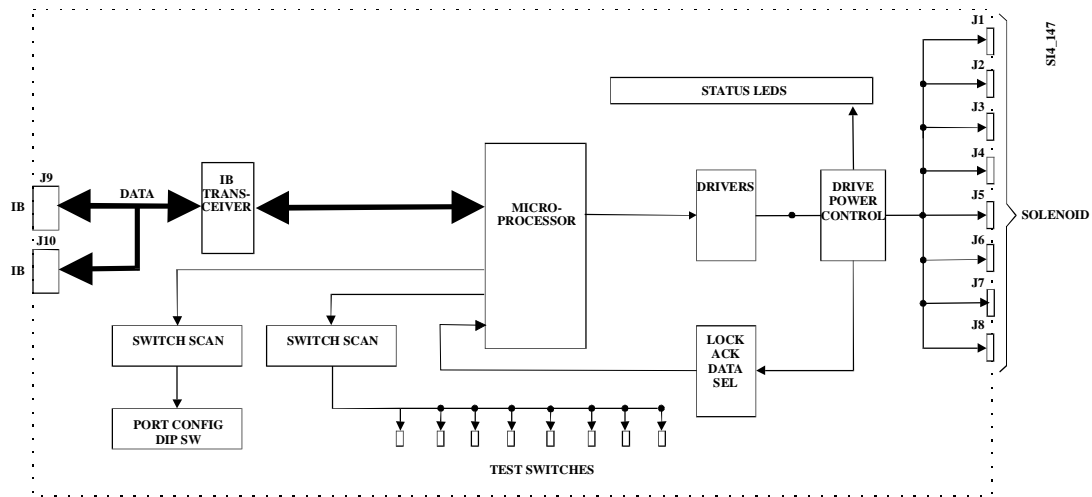


Figure 8-1 ELC Controller CCA Functional Block Diagram

8.2 Setting ELC DIP Switches

The DIP switches have one-to-one correspondence with the ELC port positions. That is DIP switch 1 is assigned to port 1 and switch 2 is assigned to port 2 and so on. The “1” or ON position of a DIP switch identifies an ELM connection to the port. The “0” or OFF position of a DIP switch identifies a SCM connection to the port.

8.3 Replacing ELC

The ELC is replaced as a unit.

8.4 ELC Troubleshooting

Use Table 8-1 to assist in troubleshooting an ELC.

Table 8-1 ELC Troubleshooting

Symptom	Possible Causes
A lock does not unlock but its LED flashes when a command is received or its test switch is activated. All other locks associated with the controller are operational.	<ol style="list-style-type: none">1. Solenoid cable may be loose or defective. Visually check cable connection. Check for solenoid power at associated connector when test switch is activated. Repair cable or replace solenoid.2. Solenoid or releasing mechanism may be defective. Remove the lock cover, but do not disconnect the modular cable (i.e., leave it operational). Manually check the freedom of the locking mechanism. If the solenoid is defective, it can be replaced (plunger remains with locking mechanism). If the locking mechanism (mechanical) is defective, the entire locking mechanism assembly must be replaced.
Locks associated with the same controller CCA do not operate.	Controller CCA for that group of locks may be defective.

9. SCM Servicing

The servicing of the SCM consists of replacing defective parts such as the cable, solenoid, key lock, locking mechanism, door switch, etc.



When working on the SCM locking mechanism (e.g., replacing a solenoid), manually press the latching arm closed so that the door cannot be inadvertently locked closed. If the door is closed while the solenoid is removed, the door cannot be opened with a key and the cabinet must be damaged to access it.

The SCM uses an electronic lock that is similar to the one used for the UDM. There are no other internal CCAs associated with this module. Other than the electronic lock assembly and solenoid/switch cable, there are no other repairable parts in the module.

9.1 SCM Controller CCA Functional Description

The SCM is controlled externally by the ELC (refer to **ELC Servicing** on page 121).

9.1.1 Door Security Lock and Position Switch

For security of the SCM contents, the door is secured by a locking device that can be unlocked by either a key override or electronically from the DT. A sensing switch is provided to detect the door position as opened or closed.

9.1.2 Replacing SCM Solenoid Locking Mechanism, Door Switch, And Key Lock

To change or replace a solenoid locking mechanism, door switch, or key lock, it is necessary to remove the top one or two shelves and latch cover (sometimes called false ceiling).

Refer to Figure 9-1 for details on accessing and replacing an SCM solenoid locking mechanism and key lock.

Solenoid Locking Mechanism:

Use the key or electronically open the SCM door and remove all contents from the SCM.

1. Remove the top one or two shelves.
2. Remove the latch cover by removing 4 nuts and 2 screws.

3. Remove the latch bracket (4 nuts). The entire locking mechanism is removed with the latch bracket.
4. Remove the two wires to the solenoid.

Note

The wire color coding and/or tags on wire connections to the solenoid. There is one red wire and one white wire. The white wire is connected to the lower terminal on the solenoid.

5. The entire solenoid locking assembly is now free for removal.

Door Switch:

The door switch is mounted independently of the locking mechanism. Pinch the detents on the switch to pull it out from its mounting bracket.

Observe wire color coding and/or tags of wire connections to the switch. There are three wires to this switch: BLACK (COM1), BROWN (C1), and GREEN (01).

Key Lock:

Note

The key lock can be removed by removing its cam arm and then the main body nut. Proceed with Step 7 to replace a key lock.

1. Disengage the solenoid pin from the latch. Push the solenoid back as far as it will go for access clearance to lock.

Note

The lock can be accessed through a cutout beneath the metal top of the SCM, or it can be accessed from inside the cabinet. If a module is stacked on top of the SCM, it may be quicker to remove the lock from within the SCM.

2. On the SCM cabinet, use a 7/16" socket to remove the lock cam from the key lock. There may be a large spacer washer behind the lock cam. An assembly view of this key lock is shown in Figure 9-1.

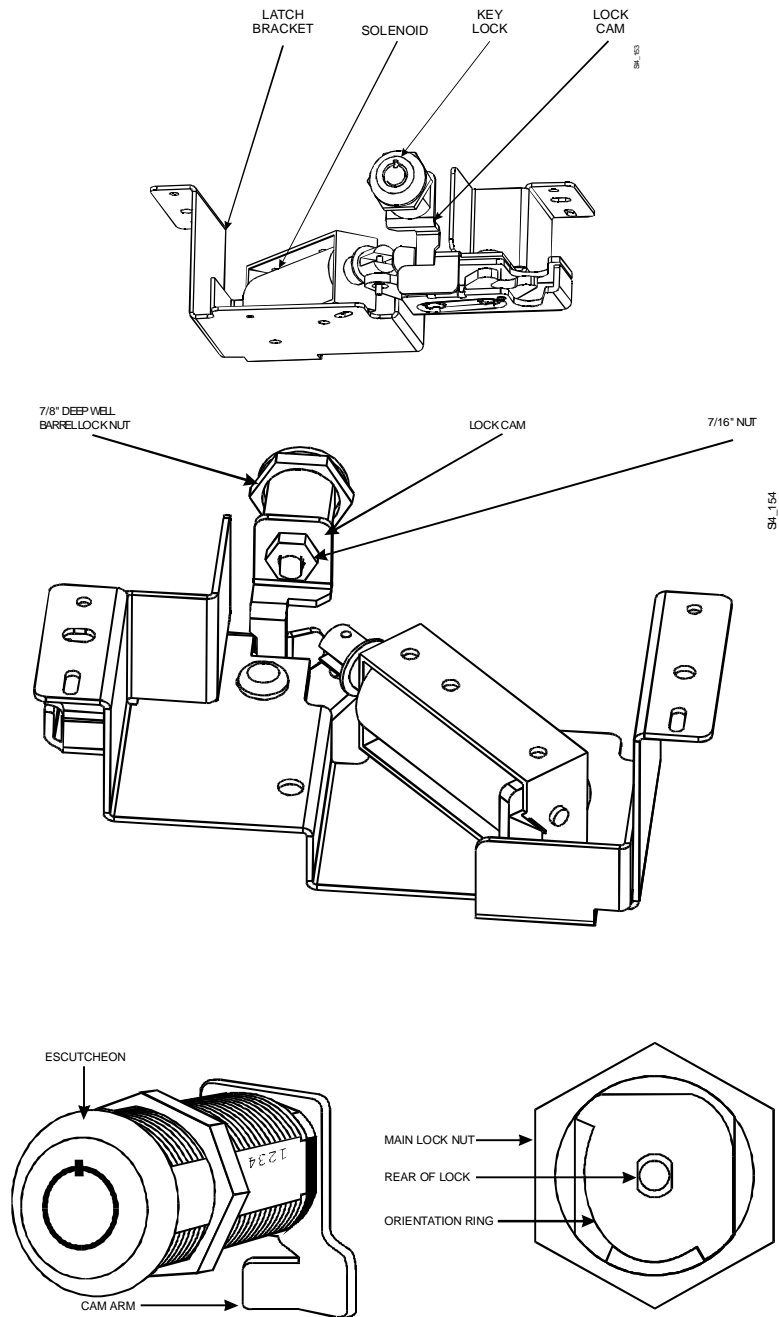


Figure 9-1 Accessing And Replacing SCM Locking Mechanism And Key Lock

3. Use a 7/8" deep well to remove the main lock nut.
4. Replacing a key lock is the reverse of removal. Additional considerations to assure correct lock installation follows:

- a. If the orientation ring comes off, be sure to reinstall the orientation ring on the back of the lock for a clockwise unlocking direction.
 - b. Install the lock so that the notch in its front escutcheon is facing up.
 - c. Install the main lock nut and cam (with nut and washer). Be sure to tighten the cam nut at 40 to 50 in-lb. A torque wrench is required.
 - d. Insert solenoid pin through latch.
5. Record the key number for the new lock on the customer's list of site key numbers. This list should be in the front of the customer's *AWS User's Guide* and should be stored in a safe place.

9.1.3 SCM Cable Termination

Note

The solenoid/switch cable is a special cable containing a wired-in diode. Do not substitute any other cable.

The solenoid cable for the module can be connected to any available ELC CCA output. The cable comes in a 15 foot length and is pre-wired to the cabinet. No interface connector is provided on the cabinet.

9.2 Replacing Shelves, Slides and Dividers

Refer to the *MedSelect Restocker's Guide* for information concerning replacement of these items in the cabinet.

9.3 SCM Troubleshooting

Refer to **ELC Troubleshooting** on page 123.

10. ELM Servicing

The servicing of the ELM consists of replacing defective parts such as the cable, solenoid, key lock, locking mechanism, door switch, etc.

10.1 ELM Functional Description

The ELM is controlled externally by the ELC, which also controls any SCMs.

10.2 ELM Troubleshooting

Refer to the ELC troubleshooting.

11. SmartStock (Barcode Scanner and IRDA) Servicing

For detailed information on the scanner or IRDA, refer to the manufacturer's manual. If the scanner or IRDA does not function properly, the entire device must be replaced.

11.1 Scanner Troubleshooting

The scanner includes a recharging base. The base should be plugged in, and the scanner should be placed in it between uses for recharging and safekeeping. The LED on the scanner recharging base will glow continuously when the scanner is actively recharging and will flash when the scanner battery is "topped off".

If the scanner battery is allowed to discharge completely, it will lose its programming and need to be re-initialized. The battery should be recharged and the scanner re-initialized and updated. The *RWS and SmartStock User's Guide* includes instructions on re-initializing and updating a scanner.

If a scanner does not work even when fully charged and initialized, it should be tested at another IRDA to verify that the scanner is defective.

A defective scanner should be replaced and returned for repair.

11.2 IRDA Troubleshooting

The IRDA is plugged into comport 4 at the DT. At a customer PC, the IRDA will be plugged into an available comport of the customer's choosing. Please note the comport before unplugging an IRDA at a customer PC.

If the IRDA appears to be defective, first test it with a different scanner to verify that the scanner is not the problem. Also check the IRDA connection. If the IRDA still does not work, do the Loopback test (see **Loopback Test** Section 11.2.1) to verify that the comport is functioning. If the comport is functional, replace the IRDA.

11.2.1 Loopback Test

1. Obtain a DB-9, female connector. Jumper the pins together as described. (Or order P/N 29-012221-000A)

Pins 1-4-6
Pins 2-3
Pins 7-8-9
2. Exit the application, disconnect the IrDA, and place the loop back plug in the IrDA port in question.
3. From the Start menu select **Programs, Accessories, HyperTerminal**

4. From the HyperTerminal window select PORT X. Type any character, if it is displayed in the window the Comport is operational.

12. Thermal Printer and Remote Power Supply Servicing

For detailed information on the printer, refer to the manufacturer's manual. The following information is for a typical printer. The printer in use may differ from that described below.

12.1 Printer Power Supply Specifications

The power supply can accept either 115VAC/230VAC or 50/60 Hz primary power operation.

12.2 Resolving Paper Jam

With exception of a paper jam beneath the roller or in the cutter, all other problems will require replacement of the printer. Most paper jams can be resolved by opening the cutter to clear the paper. If the paper jams beneath the roller and becomes wedged tight enough to prevent roller movement, then the plastic paper guide must be removed to resolve the problem. If this becomes a re-occurring problem, then the printer should be replaced.



Do not touch the print head. It is delicate and can be easily damaged. A damaged print head will require replacement of the printer.

Proceed as follows to remove a roller (refer to Figure 12-1):

1. Open the printer cover and auto cutter.
2. Open the print head lever by moving the head from the roller.
3. Carefully remove any jammed paper at this point by cutting it free.
4. Cut the paper roll free and remove roll from printer.
5. Try to manually move roller forward (roller will only move forward if it moves at all) to bring up paper from underneath the roller. Use the gear teeth at the end of the roller to move it.
6. If the remaining jammed paper becomes free at this point, then the jam has been resolved and the printer can be restored. If the jam persists, proceed with Step 7.

7. On the right side of the printer (when facing the printer control panel), use a #1 Phillips head screwdriver to remove the screw that holds the plastic paper guide. Remove the guide.
8. Carefully remove any remaining paper wedged under the roller.
9. Reassemble the plastic paper guide to the printer and otherwise restore the printer.

12.2.1 Resolving Paper Reloading Problem

If the paper is difficult to re-thread through the auto cutter, then the cutter blade may be in the wrong position. Reposition the blade as follows (refer to Figure 12-1):

1. Open the printer cover and auto cutter. The cutter blade holder should be all the way down so that the blade is not extended into its cutting position.
2. An adjustment hole is provided on the right side of the cutter assembly to allow setting of the cutter blade position. Insert a #1 Phillips-head screwdriver into the hole and turn clockwise to lower the holder to its lowest point on the assembly. Additional turning of the adjustment will begin to raise the holder.
3. Restore the printer.

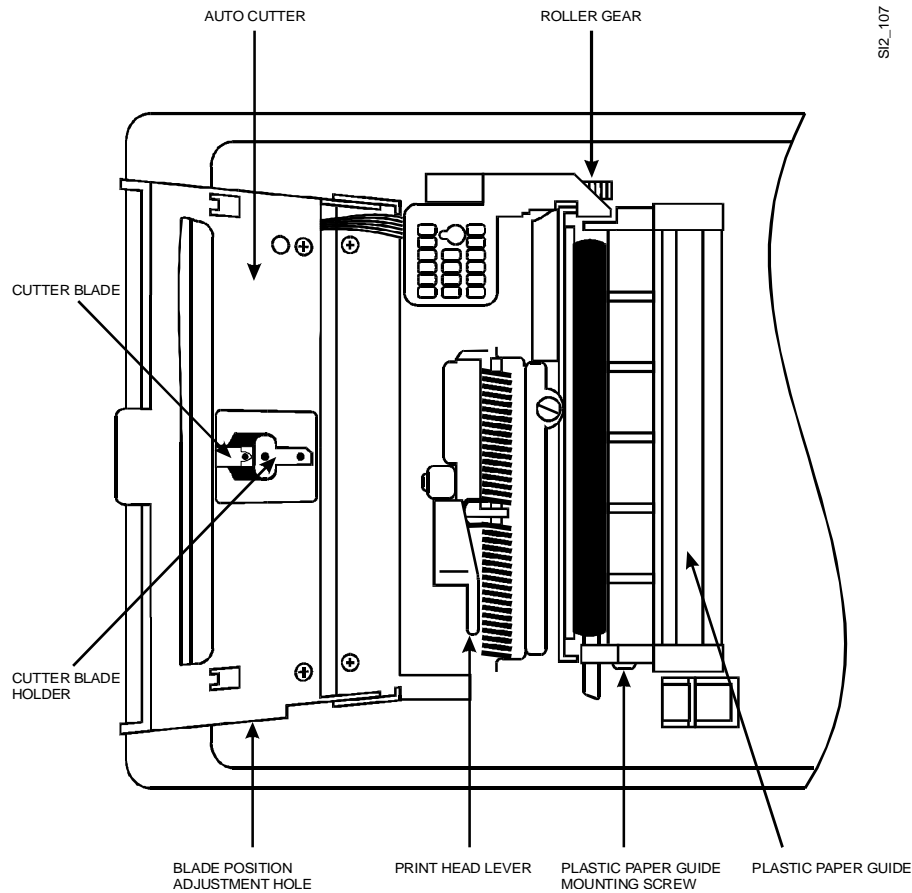


Figure 12-1 Printer Internal Assemblies

13. System Server Servicing

Only the hard drives and tape drive can be replaced in the system server. If it is discovered that some problem exists other than a problem with the hard drives, replace the entire server. If so, swap the disks out of the old server and put them into the replacement server. Verify all option boards are transferred, if necessary, from the old to the new server. Check the memory modules. This will allow the new server to be brought on-line and be fully functional without having to perform any disk recovery procedures.

If a hard disk fails, it can be replaced, and the data can be recovered from a tape backup. The server uses SCSI drives. When replacing a drive, always check that the jumpers **on both drives** are properly set: SCSI address 1 on top and SCSI address 0 on bottom.

All symptom-cause relationships associated with personal computers also apply to the server. All operating system built-in maintenance utilities can be used to examine and troubleshoot the server.

For instructions on restoring data to a system server or other support issues, consult the *Server Administration Guide*, TP-820084-001B.

A multi-port serial board is included in a slot for connecting to a variety of hospital systems. Configuration information for the serial board is also detailed in the *Server Administration Guide*.

14. Uninterruptible Power Supply (UPS) Servicing

Each DT and server of the MedSelect System is backed up with a local UPS to allow an orderly power down in the event of a main power failure or uninterrupted service in the event of a momentary power glitch or brown out. The UPS is capable of providing short term 115VAC source at 700 VA for several minutes.

A malfunctioning UPS should be replaced. See **Parts List** on page 163 for the part numbers for the server and client UPS.

15. SST Servicing

The SupplySource Tower (SST) is a device on a SupplySource System IB, which is **not** a part of the MedSelect System. At present (as of publication date), the SST is not intended to function as a device on the MedSelect System.

15.1 Tower Capacity on the IB

Any number of SST cabinets can be connected to the IB of the SupplySource DT, within the power capacity of the 24-volt supply. Power supply repeaters are available that enable an additional two SSTs per repeater to be added to the IB. The repeater is designed to be mounted on the top of a SST in the same manner as an IB hub. A DT-2 System is always a part of this system. The SST cabinet is designed to accept the standard DT channel mount on either of its side panels. Knockout holes are provided in the side panels for this purpose (see *Installation Guide*).

15.2 Cabinet Description

Each SST cabinet is designed to provide controlled access and accountability for general medical supplies that are stored on open shelves. The cabinet is not designed to provide vault type security. Rather electronic door latches and door open feedback status is used to provide limited security. Items are taken, returned, and accounted on the honor system once inside the cabinet.

15.3 Cabinet Configuration

All cabinet shelves are pre-installed at the factory according to the sales order. Options such as shelf dividers, cell dividers, door joining kits, fixed shelf bins, and shelves purchased after the initial order will require field installation.

Generally, initial installation is performed at the receiving area, or area designated by the customer, and consists of arranging (configuring) shelves within the cabinet and then stocking according to the customer's specifications. At this time, the shelf cabling is connected, and position labeling affixed. Complete details, which include the sequence of installation, are contained in the *Installation Guide*.

15.4 Shelf Descriptions

The shelves can be either fixed or sliding types and can be arranged in any combination within a cabinet. Fixed shelves can have removable bins and dividers; whereas, sliding shelves have removable dividers inside fully attached bins. The fixed shelf bins can be divided three compartments deep. All sliding shelves are mounted with a detent to

prevent accidental withdrawal from the slides. The maximum design number of shelves is 16 per cabinet, but the actual number of shelves depends on the heights of the supplies. Sliding shelves cannot be installed behind the top door. Both the fixed and sliding shelves can be repositioned without the use of tools. The fixed shelf simply lifts up and out. The sliding shelf must first be fully extended and removed from the slides. The remaining slide assembly in the cabinet can then be lifted up and removed.

15.5 Position LED Indicators and Pushbuttons

Besides a door indicator LED (see **Door Configuration and Security**, below), each shelf has a series of LEDs and pushbuttons to identify selected stock locations and to provide a means for entering quantities of stock taken and returned. The LEDs and pushbuttons are provided as a part of the shelf assembly and are conveniently located along the front edge of the shelf with a counter for visually tracking items taken or returned from a shelf section. A CLEAR pushbutton is provided to clear entry errors.

15.6 Door Configurations and Security

The cabinet can have several door configurations ranging from a single ganged door (i.e., doors attached to each other) to a maximum of four individual doors. All doors have an electronically controlled lock latching mechanism, but access is also provided via a mechanical keyed lock as an override. All doors of a cabinet have identical mechanical locks; thus, one cabinet key will operate all door locks of the cabinet (i.e., identical key codes). However, each cabinet has a unique key code.

The cabinet and doors are designed for either right or left hand hinging. The door lock rail of the cabinet and the door hinge rail can be swapped to implement this feature. A sensing switch is also provided for each door. The switch detects and reports to the controller the door position as opened or closed.

The doors are not designed to provide vault type security. They can be forcibly opened, but not without causing severe and noticeable structural damage to the cabinet. An optional cabinet divider is available to prevent access to a cabinet section from above or below its locked door.

All doors include an indicator LED. This LED is actually mounted on the cabinet lock rail and is visible through a lens port on the door latch handle. The LEDs are internally connected to a cable harness. Individual LEDs can be replaced as a piece part.

When the LED is lit, the selected (or user accessible) stock is located on a shelf behind this door. The ON status of the LED also indicates that the door is unlocked to allow access to this section of the cabinet. On a sectionalized cabinet (i.e., more than one door), the LED flashes to bring attention to the selected stock section.

15.7 Cabinet Interior Lighting

If the internal lighting is ordered, it will be factory installed, including the florescent tube. This kit is also available for field installation.

15.8 Shelf Cable Access Panels

Shelf connections are made from the rear of the shelf to a corresponding cabinet connector (total of 16 connector positions) along the left (facing cabinet front) inside rear corner of the cabinet. Although shelf connections can be made from the front of the cabinet, rear access panels are provided to allow easy access to these connectors. It is necessary to pull the cabinet out to the front of its floor mount to open these panels. The cabinet should **never** be removed completely from the floor mount when stocked.

15.9 Cabinet Cable Harnesses

The cable harnesses included with the cabinet are the lock controller harness, IB distribution harness, and components associated with the optional interior light. The lock controller CCA and florescent light ballast are mounted on top of the cabinet and beneath the removable top panels (Figure 15-7). An on-off rocker switch for the light is located on the top, front right side of the cabinet.

The wiring harnesses are shown in Figure 15-1. One cable harness distributes the IB to the shelf controller CCA of each electronic shelf. The electronic door lock cable provides control to the four door locks, switches, and indicator LEDs. This particular cable is always present whether or not all the four door positions are used.

Note

When replacing a cable harness, note the routing and tie down method of the original and reinstall the replacement in the same manner.

15.9.1 Shelf IB Distribution Cable Harness (Standard Cabinets Only)

The IB distribution cable harness for the shelves is routed down the inside of the left rear panel from the cabinet top (see **Shelf Cable Access Panels**, above) and is divided into 16 connectors accessible from the cabinet interior. The shelves are then connected to their corresponding position connector via a coiled cable. The use of sixteen position connectors is standard and is always present regardless of the cabinet shelf makeup.

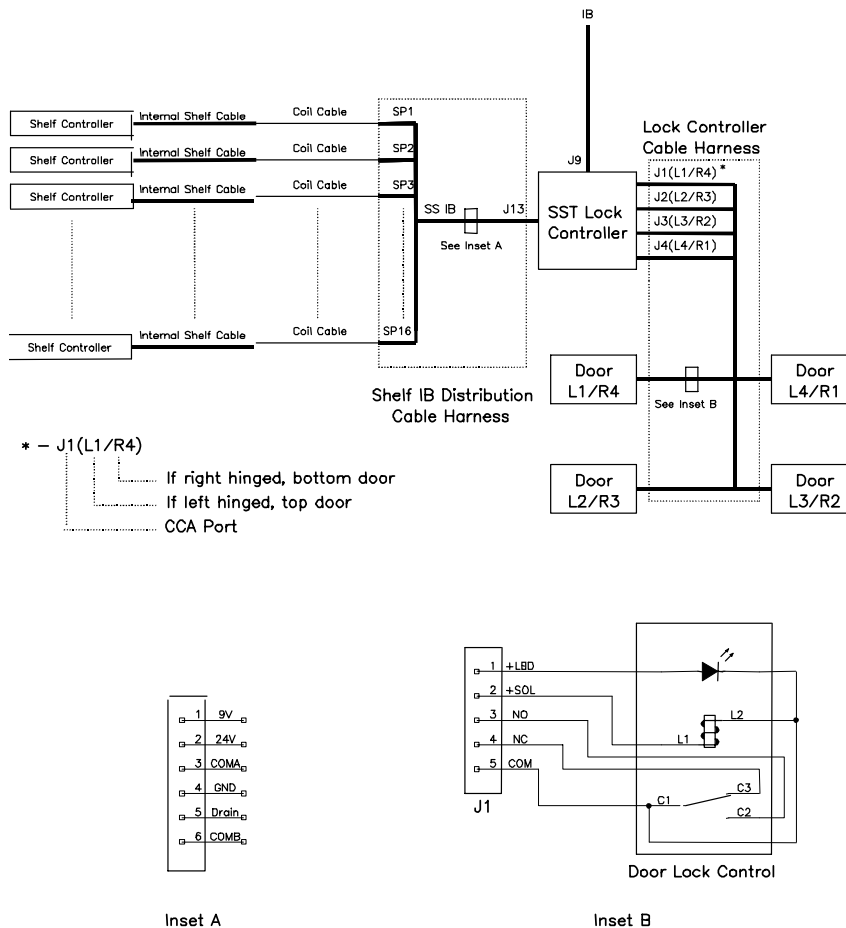


Figure 15-1 Shelf Lock Controller Cable Harness

15.9.2 Lock Controller Cable Harness

The lock controller has four output ports for activating the electronic door locks. The cable harness is routed from the top of the cabinet and down through the front right side panel of the cabinet (for doors hinged on the left. For right hinged doors, the panel is mounted on the front left.) From this point, the harness is distributed to each door lock, switch, and LED. This lock rail panel must be removed to access the cable harness.

15.10 Cabinet Transit and Mounting

The SST cabinet must always be secured to a floor mount, except when intentionally relocating the cabinet. Two floor mounts are associated with the cabinet. A temporary floor mount is used when initially configuring the cabinet in an area other than its permanent location. This may be desirable for the customer so as to minimize interference with existing operations at the permanent location.

A temporary mount(s) may be shipped to the customer site for initial installation at the request of the project manager, but it is not a customer purchased item. The temporary mount is returned. A permanent mount is shipped with the cabinet and is owned by the customer. The permanent mount is designed to be either secured to the floor by anchors or secured to a wall with lag screws (wood studs) or with toggles (metal studs and unsupported wall sections). Mounting details are provided in the *Installation Guide*.

For mobility of the cabinet during installation and service, casters are provided on each cabinet. Once in the final position, levelers are adjusted to set the cabinet level. The front levelers are adjusted from the front of the cabinet with an open end wrench, whereas, the rear levelers are adjusted from within the cabinet with a ratchet and socket (removal of the bottom shelf or shelves may be necessary to access the leveler holes). A socket extension will be needed to reach into the leveler wells at the rear of the cabinet.

15.11 SST Lock Controller CCA Functional Description

The SST lock controller CCA is similar to the ELC CCA with the addition of a 9 VDC switching power supply on board to power the shelf controllers. One main operational difference for the CCA is during door unlocking. For the SST, electronic door unlocking is only done with continuous power to the locks. If power is interrupted, the doors return to a locked state.

The IB 24 VDC is used as the source for the on-board 9 VDC supply. The IB pin out for the SST is the same as the standard MedSelect IB, except pin 1 is now 9 VDC going to the shelf IB distribution cable. Since no MedSelect Rx dispensing devices are ever used on the SST IB, there is no conflict associated with the decreased IB voltage level.

The functional block diagram for the SST lock controller CCA is shown in Figure 15-2.

The CCA microprocessor has a built-in system controller address. This address was permanently assigned to the microprocessor by its manufacturer and is unique. The device address is labeled on the microprocessor chip and cannot be changed. If the microprocessor chip is replaced, the new address must be recorded in the system.

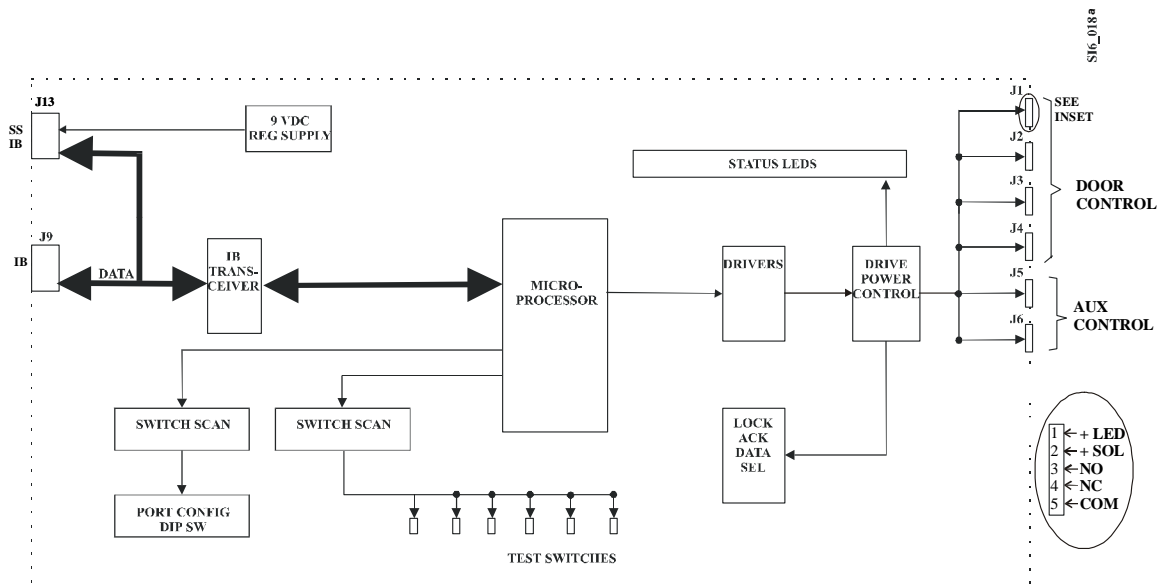


Figure 15-2 SST Lock Controller CCA Functional Block Diagram

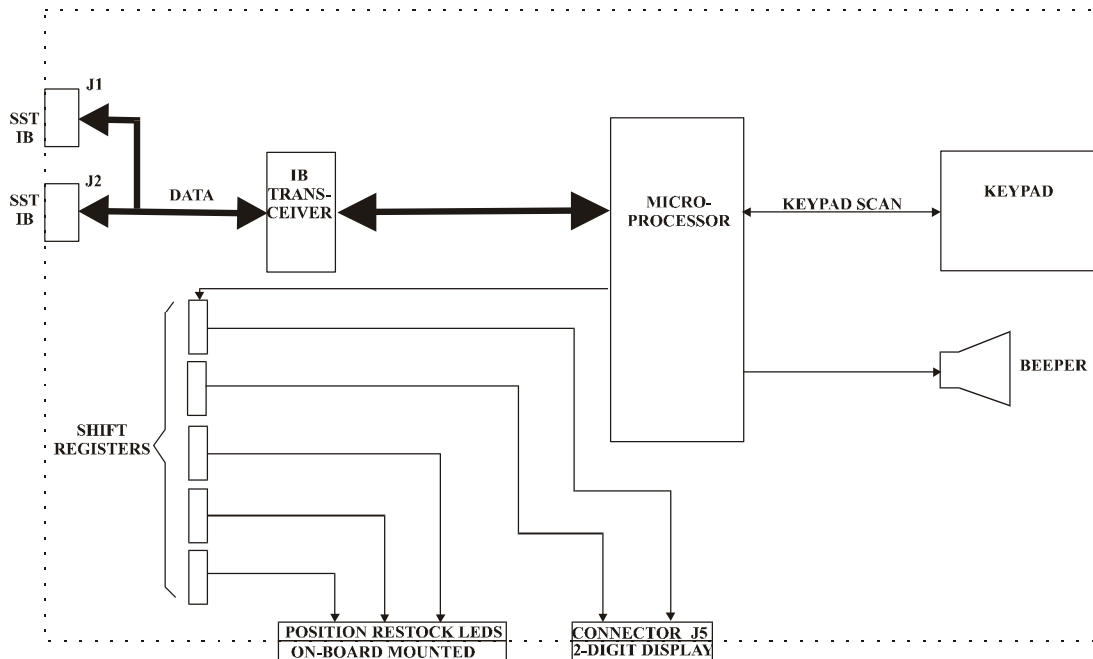
15.12 SST Shelf Controller CCA Functional Description

The SST shelf controller CCA is unique to the SupplySource System and is not used as a controller in the MedSelect System. Refer to Figure 15-3 for a functional illustration of the shelf controller CCA.

All electronics for a shelf are located on its shelf controller CCA. The CCA is mounted inside a channel attached to the front edge of the shelf and contains the controller CCA, keypad, and display CCA. The IB cable for the shelf is terminated at both ends with a connector. The cable is routed from the back edge of the shelf and then forward along the right side edge of the shelf to a mating connector on the controller CCA inside the extrusion. The CCA connection is always made on the right side of the extrusion. The rear IB cable connector is mounted on a flange on the rear edge of the shelf and is the connection point for the coiled cable.

Each controller CCA has on-board LEDs that show through the front keypad as the position indicators and a two-digit counter for visually keeping track of taken and returned supplies. Each time a key is pressed, the on-board buzzer beeps once to indicate acceptance of key press. The buzzer will double beep if an input error is detected such as a count over flow. Refer to the *SupplySource Display Terminal Dispensing Guide* for additional information concerning use of this system.

The CCA microprocessor has a built-in system address. This address was permanently assigned to the microprocessor by its manufacturer and is unique. The device address is labeled on the microprocessor chip and cannot be changed. If the microprocessor chip is replaced, then the new address must be recorded in the system.



S16_017

Figure 15-3 SST Shelf Controller CCA Functional Block Diagram

15.13 IB Hub CCA Functional Description

The IB hub is identical in function as the IB module. It uses the same IBPC CCA and power supply. The only difference between the two units is that the IB hub has a power on-off switch and its outward appearance has been slightly redesigned to accommodate the switch and a more versatile mounting capability. Refer to **IBPC Controller CCA Functional Description** on page 63.

15.14 IB Power Repeater CCA Functional Description

The IB repeater is mounted on the top of the third cabinet in a series of cabinets where the power repeater for the IB is needed for the device string. The repeater is simply daisy chained along the IB sections that have been determined for the additional power requirement. This power determination was previously calculated during initial system planning (see *Installation Planning Guide*).

Note

The IB repeater is also compatible with the MedSelect System and can be used to extend its IB device loading capability.

Referring to Figure 15-4, the IB repeater repeats the 24 VDC IB power at pin 1. Essentially, the repeater is a 24 VDC power supply that uses the same internal power supply as contained in the IB hub. A power on-off switch is provided. To prevent inadvertent swapping of the extended IB with the existing IB connection at the repeater, the output (i.e., extended) connector on the repeater is a DB connector rather

than the usual IB rectangular (Molex®) type. Therefore, the extended IB cable section that connects to the repeater is not a standard IB cable part. All other IB cable sections in the daisy chain are standard IB cables (i.e., standard rectangular connections at both ends).

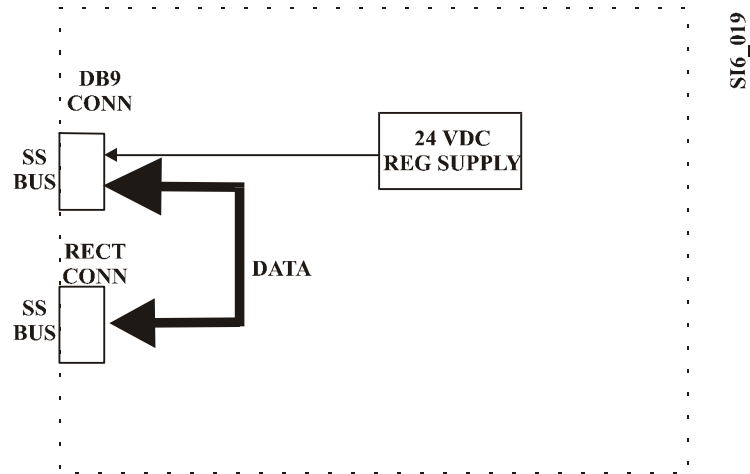


Figure 15-4 IB Power Repeater Functional Block Diagram

15.15 SST System Components Replacement

Be sure to remove all power and shut down the system before replacing any component. Never hot swap a CCA. The cabling diagram for the SST system is the same as the DT-2 System shown in Figure 4-1.



The computer mount provides structural support for the top panel. Thus, if it is necessary to access items beneath the panel, the panel can be removed with all top mounted items (DT-CPU, IB hub, and UPS) attached. However, if it is desired to lighten the lifting load, any or all top items can be removed, except the computer mount. Both the top large and small panels are each secured in place by two screws. Either one of the panels can be removed first (i.e., panels not interlocked).

Refer to Figure 15-5 for the location of major parts.

Note

Table 15-1 may change as revisions dictate with this item of equipment.

Table 15-1 SST Major Components

Item	Part Number	Description
CABINET		
1	49-017139-000A	IB CABLE HARNESS
2	49-017165-000A	ELECTRONIC DOOR LATCH
3	39-014095-000A	DOOR SWITCH
4	49-017097-000A	HINGE, END A
5	49-017097-000B	HINGE, MIDDLE
6	49-017097-000C	HINGE, END B
7	49-017088-000A	LOCK CABLE HARNESS
8	19-040186-000A	LOCK CONTROLLER CCA
9	39-014030-000A	BALLAST WITH CONNECTOR
10	29-013775-000A	LOCK SET
11	49-021173-000A	HINGE SHIM
12	39-009916-000A	LIGHT ROCKER SWITCH
13	19-038342-000P	PROM, LOCK CONTROLLER
14	29-013674-000A	FLOURESCENT LAMP
15	29-013675-000A	SINGLE PIN LAMP SOCKET, FIXED
16	29-013676-000A	SINGLE PIN LAMP SOCKET, PLUNGER
17	49-017089-000A	ELECTRONIC SHELF CABLE HARNESS
SHELVES		
18	49-017075-000A	LEFT SLIDE AND BRACKET
19	49-017075-000B	RIGHT SLIDE AND BRACKET
20	49-017091-000A	SHELF COIL CABLE (NOT SHOWN)
21	49-017145-000A	SHELF INTERNAL CABLE
22	49-017174-000A	SHELF LABEL SET
23	19-040192-000A	SHELF CONTROLLER CCA

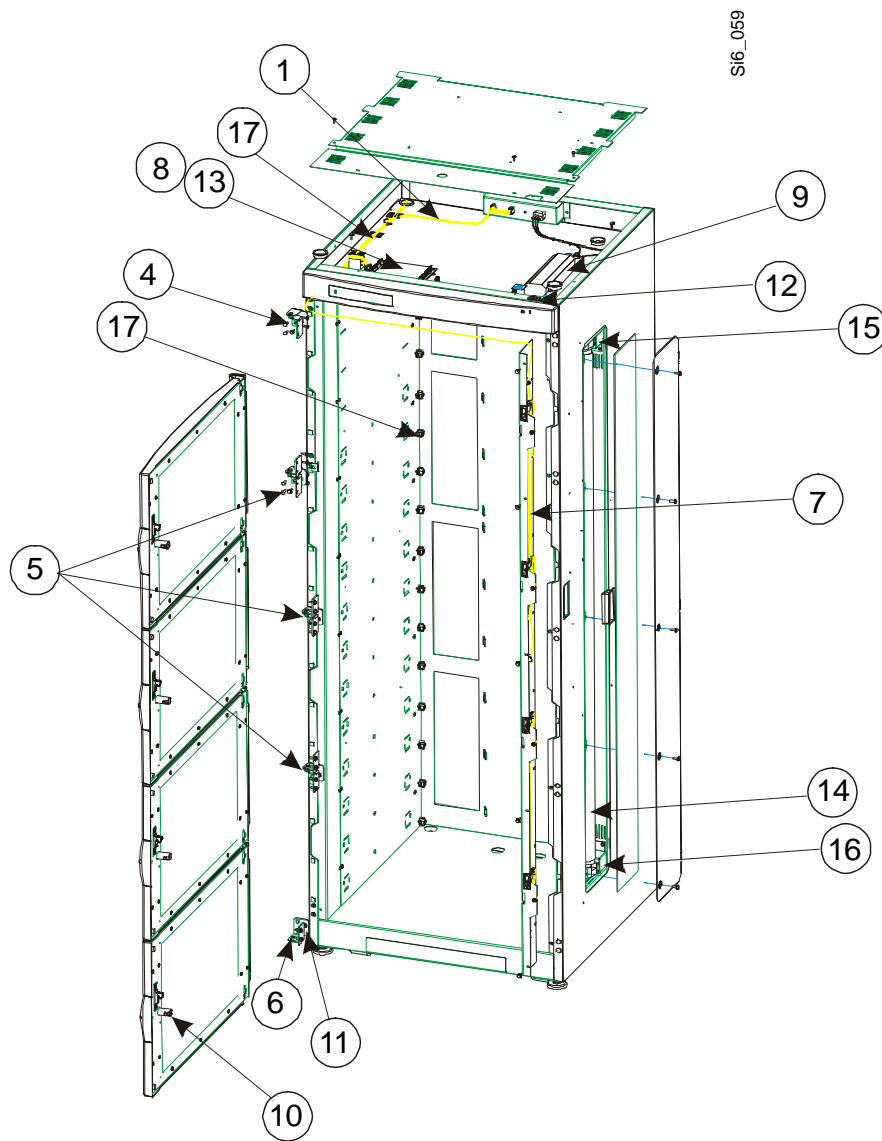


Figure 15-5a SST Major Components

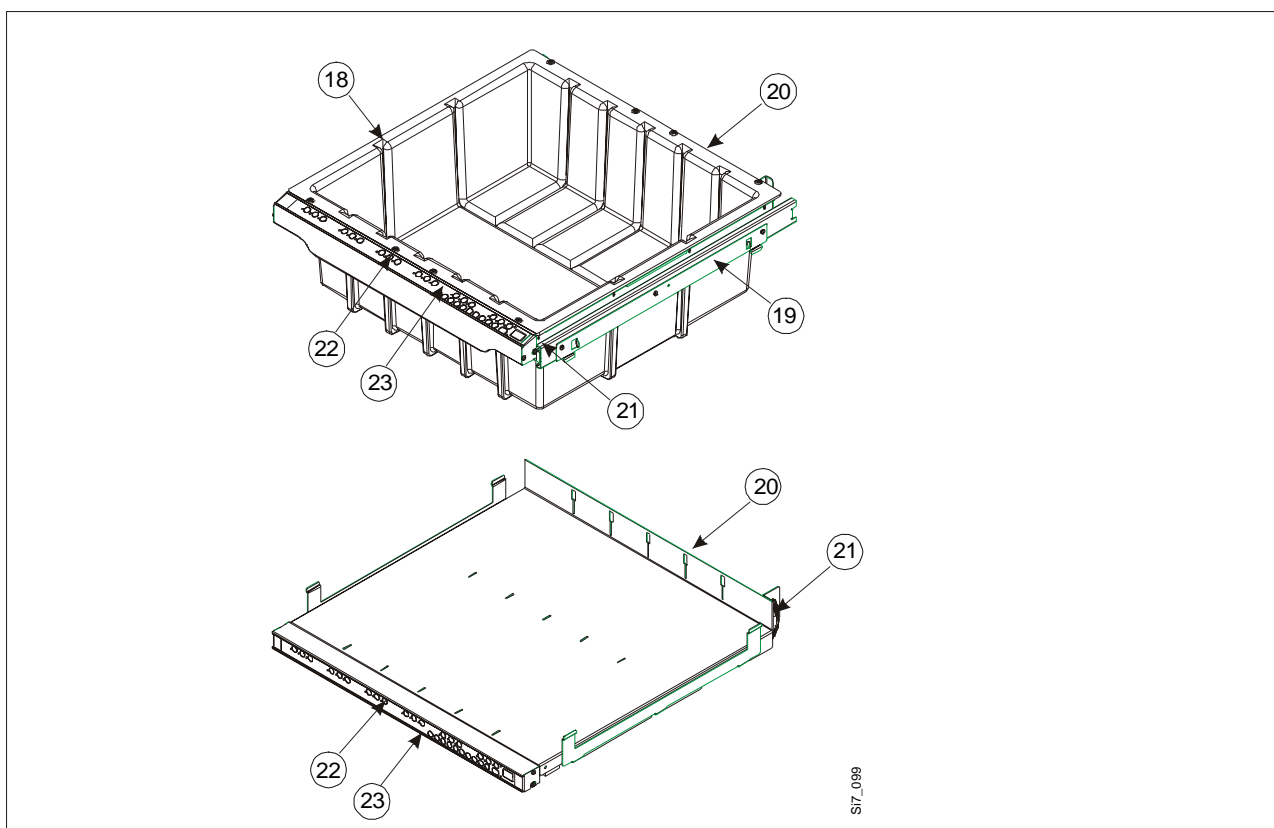


Figure 15-5b SST Major Components (Continued)

15.15.1 Replacing DT-UI

The complete DT-UI installation is covered in the *Installation Guide*.

15.15.2 Replacing DT-CPU

The DT-CPU consists of a dedicated PC, which is mounted inside an enclosure called the computer mount. The procedure for installing the PC inside the computer mount is covered in the *Installation Guide*. The entire DT-CPU unit is secured to the large top panel on the cabinet. It is not necessary or recommended to remove the computer mount from this panel to service or replace the PC. The PC will pull out of the front of the computer mount after removal of the hinged cover (and rear cables).

15.15.3 Replacing IB Hub

The IB hub is secured to the top of the cabinet with a mounting bracket. Observe its original mounting orientation and replace in the same manner.



After detaching the IB hub from the top of the cabinet, immediately move the unit to a safe work area. Do not allow the unit to rest on top of the cabinet unsecured as it can be inadvertently pulled off the cabinet by its attached cables and possibly cause severe injuries.

15.15.4 Replacing UPS

The UPS is secured to the top of the cabinet with Velcro. Observe its original mounting orientation and replace in the same manner.



After detaching the UPS from the top of the cabinet, immediately move the unit to a safe work area. Do not allow the unit to rest on top of the cabinet unsecured as it can be inadvertently pulled off the cabinet by its attached cables and possibly cause severe injuries.

15.15.5 Replacing IB Power Repeater

The IB power repeater is secured to the top of the cabinet with a mounting bracket. Observe its original mounting orientation and replace in the same manner.



After detaching the IB power repeater from the top of the cabinet, immediately move the unit to a safe work area. Do not allow the unit to rest on top of the cabinet unsecured as it can be inadvertently pulled off the cabinet by its attached cables and possibly cause severe injuries.

15.15.6 Replacing Lock Controller CCA

The lock controller CCA is mounted on top of the cabinet and beneath the top panels. It is only necessary to remove the small panel to gain access to this CCA even though the CCA cable connections are partially hidden by the large panel. The CCA is mounted on five standoffs. Three of these standoffs are push-on types, and the other two use mounting screws. Mark or tag all connector designations before removal of cables.

15.15.7 Replacing Shelf Controller CCA

It is necessary to partially pull out a shelf (fixed or slide mounted) in order to replace the shelf controller CCA. There needs to be enough access to the front edge channel to remove the cap end screw and pull out the long CCA board from the channel extrusion. Disconnect the cable to the board (see Figure 15-6) first before pulling out the board. If the CCA cables are replaced, be sure to reinstall the original ferrite core on both ends (may already be installed).

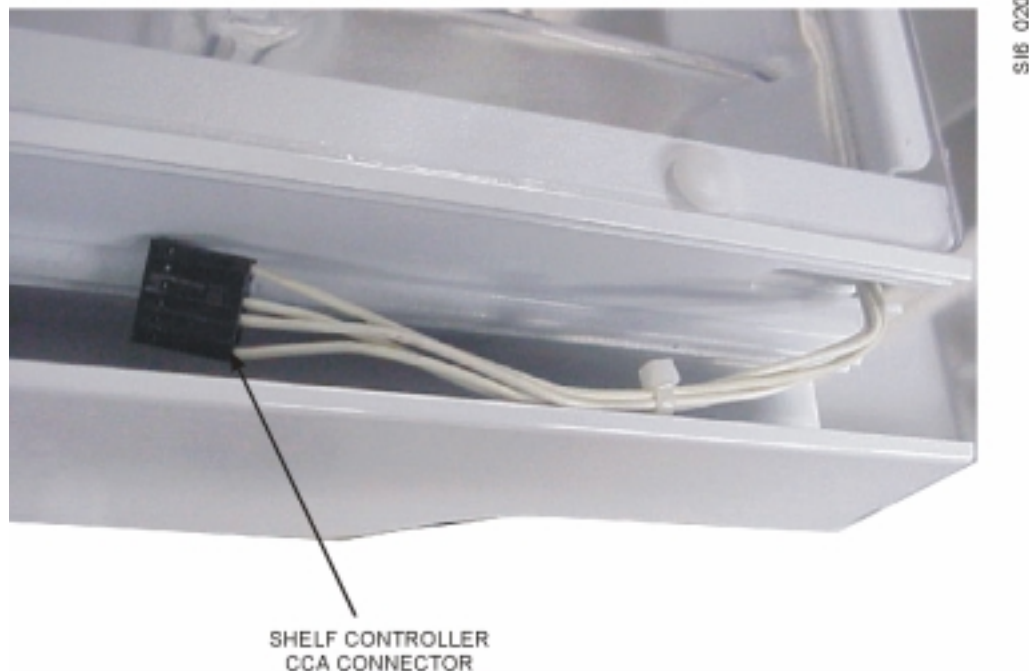


Figure 15-6 SST Shelf Controller Connector

15.15.8 Replacing Internal Light Components

The internal light components are available as a kit if a light is not factory installed. The complete light kit installation is covered in the *Installation Guide*. It is necessary to have full access to the top of the cabinet with both covers removed. Refer to Figure 15-7 for the kit wiring diagram.

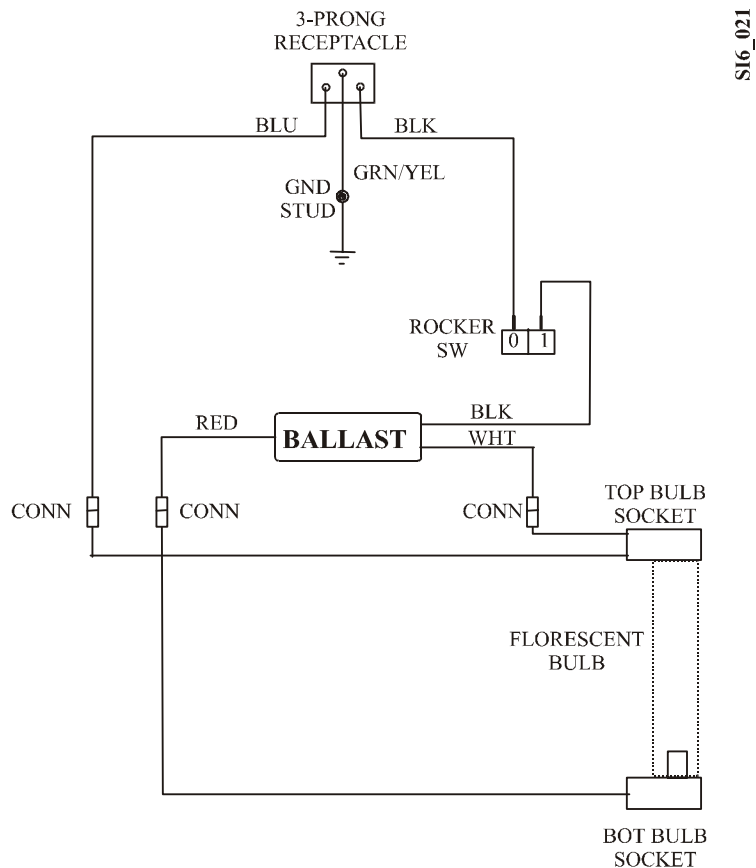


Figure 15-7 SST Florescent Light Wiring Diagram

15.15.9 Replacing Door Lock

The door lock consists of the key lock body, which includes the lock bolt. Do not confuse the door lock with the door latch. The door lock is mounted on the door proper, whereas, the door latch is mounted on the lock rail. The door latch is a solenoid operable latch, but also allows the lock bolt to be released with a key. These procedures are only concerned with replacing the door lock. The replacement method for the door latch is obvious. It is held to the rail by two screws. The lock rail must be removed to retrieve the latch from the cable bundle.

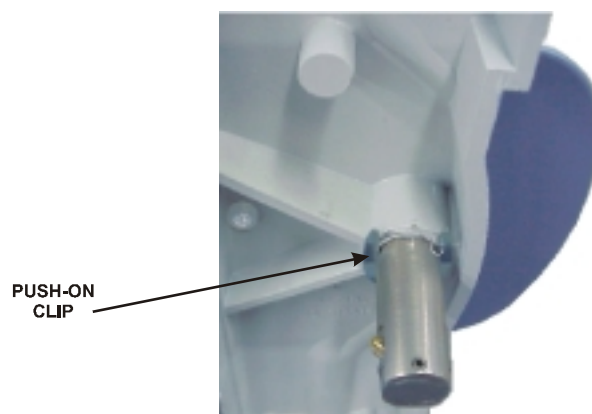
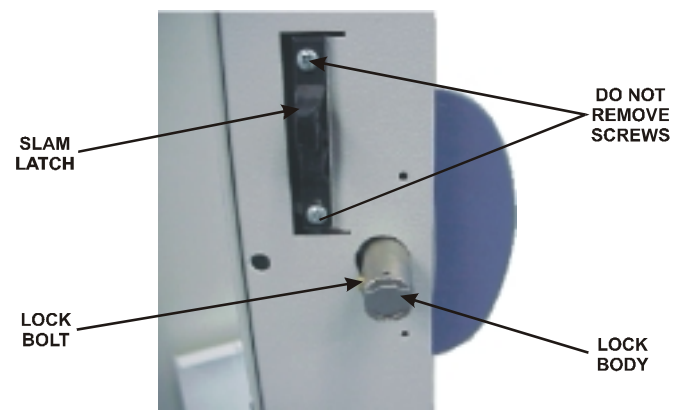
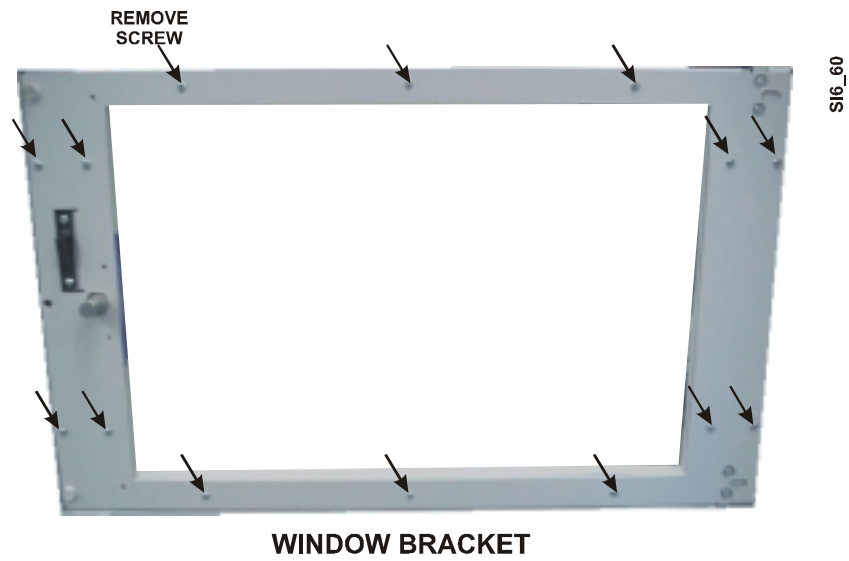
SST lock details are shown in Figure 15-8. The step-by-step procedure to replace a SST lock is as follows:

1. Open the door associated with the lock replacement.
2. Remove the 14 Phillips-head screws from the inside window bracket. Start removing the screws from the top and side faces of the bracket first so that the window does not inadvertently drop out.

Note

Do not remove the two screws that attach the slam latch (or the hinges) to the door.

3. Lift out the window and remove the remaining screws from the bottom face of the bracket.
4. Remove the push-on clip from the lock body and pop it out from the front. A new clip is provided with the replacement lock.
5. Reinstall the new lock in the reverse order of removal. Make sure the lock bolt is facing toward the outside edge of the door before installing the new push-on clip.
6. Record the key number for the new lock on the customer's list of site key numbers. This list should be in the front of the customer's *Control Center User's Guide* and should be stored in a safe place. Make sure each key has a key tag and the key tags are appropriately marked with the location and cabinet description.
7. Try the lock with its key before closing the SST door. With the door still open, try to open the lock electronically. If the SST front door jams when closed, **access can only be achieved by damaging the cabinet.**



DOOR LOCK EXPOSED

Figure 15-8 SST Door Lock Replacement

15.15.10 Replacing Door Indicator LED

The door indicator LEDs is replaceable as a piece part. The door indicator LED's are integrated into the lock/switch power and logic cable. This cable is attached to the inside of the lock rail.

Remove the lock rail. Carefully cut the defective component from the cable. Remove the resistor with the LED and mark the wire to insure that the resistor is reconnected to the same cable assembly wire. The replacement part contains an in-line resistor and wire leads attached to the LED. Reconnecting the leads requires a soldering iron and solder. Shrink tubing or tape should be used to protect exposed wires. Use tie wraps to secure any extra wire. Be sure to save the compression ring on each LED holder for reuse. The ring is necessary to prevent an LED from falling out of its holder.

Replace the lock rail and follow the procedures to horizontally and vertically adjust the lock mechanism in Section 15.15.13.

15.15.11 Replacing Door Latch

Remove the lock rail. Disconnect the connectors to the latch. Unscrew and remove the latch. Retain the screws. Attach the new latch, reusing the screws. Attach the connectors to the latch.

Replace the lock rail and follow the procedures to horizontally and vertically adjust the lock mechanism in Section 15.15.13.

15.15.12 Replacing Door Catch

Remove the lock rail. Note the connectors that are attached to each position of the catch. Remove the connectors. Remove the catch. Snap in the new catch. Attach the connectors to the catch in the correct positions.

Replace the lock rail and follow the procedures to horizontally and vertically adjust the lock mechanism in Section 15.15.13.

15.15.13 Performing Horizontal and Vertical Lock Component Adjustments

Horizontal Lock Component Alignment: Refer to Figures 15-9a, 15-9b and 15-9c. Close the top door and determine the clearance between the body of the lock (not the bolt of lock) and latch on the lock rail. The body of the lock rail must just clear latch in the lock rail. The gap between them must not be more than 1.5mm. Also ensure that the keeper on the door is reasonably aligned horizontally with the switch/catch on the lock rail – so the keeper does not touch the body of the switch/catch. If the body of the lock hits the latch on the lock rail, or clearance is too large, then it is necessary to adjust left-to-right position of lock rail.

Loosen the five front screws. Move the lock rail in the appropriate direction i.e. left or right, and secure five front screws. Recheck interference/clearance between lock body and latch. Reposition lock

rail if necessary until lock body just clears latch and the gap is not greater than 1.5mm. If the lock rail is fully deflected and there is still interference, shims are also required. Shims should only be used as a last resort.

To add shims, loosen the three hinge screws that secure the hinge to the cabinet and slip in one or two shims behind the hinges. Never use more than two shims per hinge.

Note

Generally the same number of shims should be installed for each door. Be sure the vertical alignment between the lock and latch for each door is maintained.



Figure 15-9a Door Lock Parts

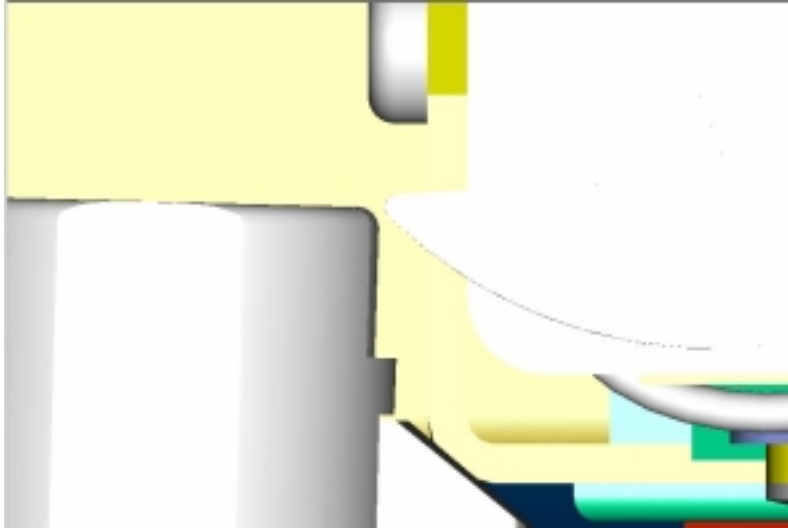


Figure 15-9b Correct Lock Barrel and Latch Clearance



Figure 15-9c Lock Barrel and Latch Interference

Vertical Lock Component Alignment: Ensure the keeper on the door is aligned vertically with the switch/catch on the lock rail. The keeper should not touch the pawl or body of the switch/catch on the lock rail when closing the door. The keeper can be adjusted vertically by loosening its 2 screws, repositioning the keeper, then retightening the 2 screws. Refer to Figure 6-9d.

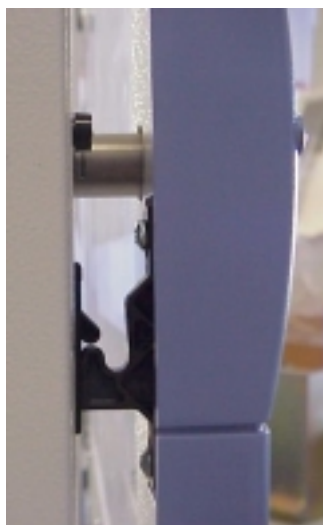


Figure 15-9d Keeper and Catch/Switch Alignment

15.15.14 Changing Door Hinge Side

Refer to the Installation Instructions (TM-MEDINS-000X).

15.16 SST Troubleshooting

Refer to Table 15-2 to troubleshoot the SST. Obvious situations (e.g., wiring, fusing, etc.) are not included, since it is assumed that experienced service personnel will be performing the analysis. There is no attempt to cover all possible situations; rather, a quick reference is provided to eliminate some likely causes of prominent symptoms.

Table 15-2 SST Troubleshooting

Symptom	Possible Causes
A lock does not unlock but its LED flashes when a command is received or its test switch is activated. All other locks associated with the controller are operational.	<ol style="list-style-type: none"> 1. Solenoid cable may be loose or defective. Visually check cable connection. Check for solenoid power at associated connector when test switch is activated. Repair cable or replace solenoid. 2. Solenoid or releasing mechanism may be defective. Remove the lock cover, but do not disconnect the modular cable (i.e., leave it operational). Manually check the freedom of the locking mechanism. If the locking mechanism (mechanical or solenoid) is defective, the entire locking mechanism assembly must be replaced.
Locks associated with the same controller CCA do not operate.	Controller CCA for that group of locks may be defective.
Door indicator position LED does not light.	Check that LED has not fallen loose from its holder. The LED holder compression ring may be cracked or missing.

Table 15-2 SST Troubleshooting

Symptom	Possible Causes
A group of IB devices do not operate.	This symptom could occur only if an IB repeater is used. Should the power supply in the repeater become defective or loses its power (i.e., turned OFF or unplugged), all devices powered by the 24 VDC repeater power will power down. Devices before the repeater or supplied by another repeater will not be affected. Should the IB hub 24 VDC supply becomes lost, the entire IB will power down since this supply also powers the IB logic in the IB hub.

16. Parts Lists (6-15-2003)

16.1 MedSelect/SupplySource Parts

Following is the most recent lists of the orderable service parts for both the MedSelect and SupplySource systems.

Category	Product	Sub-Assembly	Part Description	Part Number	Comments	Other Usage
01 Server	Server 00-101628-000A/B	Compaq Proliant 800	Server	19-040026-000B	2.1GB HDD/64MB/200MHZ	
01 Server	Server 00-101628-000A/B	Compaq Proliant 800	2.1GB Hard Drive	19-040084-000A		
01 Server	Server 00-101628-000A/B	Compaq Proliant 800	IC RAM MDL, 032 *36 DYN	19-040085-000A	32 MEG RAM DIMM CHIP FOR PROLIANT 800	
01 Server	Server 00-101628-000A/B Server 00-101631-000A/B	Compaq Proliant 800 Compaq Prosignia 300	Digital Tape Drive	19-038619-000A		
01 Server	Server 00-101631-000A/B	Compaq Prosignia 300	1.2GB Hard Drive	19-038623-000B		
01 Server	Server 00-101631-000A/B	Compaq Prosignia 300	Server	19-040026-000A	1.2GB HDD/32MB/90MHZ	
01 Server	Server 00-101639-000A/B	IBM Netfinity 3000	Server	19-040166-000A	4.3GB HDD/128MB/350MHZ	
01 Server	Server 00-101639-000A/B	IBM Netfinity 3000	CCA Token Ring	19-040185-000A	IBM	
01 Server	Server 00-101639-000A/B	IBM Netfinity 3000	64MB RAM Module	19-041165-000A	NF 3000	
01 Server	Server 00-101639-000A/B	IBM Netfinity 3500	CCA Token Ring	19-040185-000A	IBM	
01 Server	Server 00-101639-000A/B	IBM Netfinity 3500	Multiport Serial CCA	19-040021-000B		
01 Server	Server 00-101639-000A/B	IBM Netfinity 3500	4.3 GB Hard Drive	19-040129-000A		
01 Server	Server 00-101639-000A/B	IBM Netfinity 3500	Digital Tape Drive	19-040130-000A	Also used in netfinity 3000	
01 Server	Server 00-101639-000A/B	IBM Netfinity 3500	CRT 15"	19-040131-000A		
01 Server	Server 00-101639-000A/B	IBM Netfinity 3500	Server	19-040134-000A	4.3GB HDD/128MB/266MHZ	
01 Server	Server 00-101639-000A/B	IBM Netfinity 3500	9.1 GB Hard Drive	19-040184-000A	Also used in netfinity 3000	
01 Server	Server 00-101654-000A/B	Compaq ML350	Server	19-040239-000A	No harddrives or tapedrive 18.2GB HDD/128MB/600MHZ	
01 Server	Server 00-101654-000A/B	Compaq ML350	18.2GB Hard Drive	19-040241-000A	Only for ML350 Hot pluggable drive	
01 Server	Server 00-101654-000A/B	Compaq ML350	12/24GB Dat Drive	19-040242-000A	Only for ML350	
01 Server	z Common to All	UPS	Server UPS Battery	11-040182-000A		Server

01 Server	z Common to All	UPS	Power Supply Uninterruptable Whole Unit	21-017571-000A		Server
01 Server	z Common to All		Modem 33.6K Data/Fax Extl W/Power sup	39-013255-000B		Server
02 DT	DT 1.0 / 00-101620-000A/B	DT-CPU	IB Module	00-101629-000A	replaced by 00-101653-000A	DT1,1.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-CPU	IB Hub Kit	00-101653-000A	also replaces IB module 00-101629-000A; 00-101629-000A Rev 4 can be used up to replace any 00-101629-000A (can not replace 00-101653-000A)	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-CPU	IC,mem,ram mdl, 4x36, simm replace in pairs	19-038704-000A	16MB SIMM REPLACE IN PAIRS, DO NOT USE, DTs need 64MB and can get simms from Development	
02 DT	DT 1.0 / 00-101620-000A/B	DT-CPU	Token Ring Card, DT, OLICOM# OC-3221	19-040002-000A	PCMCIA Token Ring adapter for databricks	
02 DT	DT 1.0 / 00-101620-000A/B	DT-CPU	Datalux databrick	19-040039-000A	Universal replacement ethernet and token ring	
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Keyboard	19-038598-000A		
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Power Supply	19-040001-000B	Deep shell and shallow shell (must alter for shallow shell (old, old DTs))	
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Security/Vanity Shield, DT	19-040016-000A	Hangs by screws not snap on	
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Touch Screen	19-040052-000A	Dynapro conversion to the flat backplate made 5/99 to accomodate new circuit boards in the enclosure	
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Card reader std track 2	19-040063-000A	Credit card standards,magnetic	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Card reader	19-040063-000B	Customized version,magnetic	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Card reader track 3	19-040063-000C	Magnetic	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Bar code reader	19-040089-000A	Bar code symbologies Infrared	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Logic cable for barcode reader	19-040090-000A		DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Keyboard wedge for barcode	19-040091-000A	Programmed decoder	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Keyboard Tray	19-040093-000A		DT1,1.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Keyboard support hinge	19-040148-000A	Kbd tray hinge	DT1,1.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	MicroTouch Touchscreen	19-040163-000A		DT1,1.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Extension pivot arm	19-040169-000A		DT1,1.5

02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	Keyboard Hinge Kit	19-040259-000A	includes support arm, brackets and fasteners	DT1,1.5
02 DT	DT 1.0 / 00-101620-000A/B	DT-UI	CA,LGC,SER EXTN,15FT,DB9	39-014087-000A	Brick to IB Hub/Module	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	Printer	CA, Lgc, pri Prntr, 15ft	19-033330-000D	receipt printer cable (not included with printer)	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	Printer	Parallel printer cable, 15ft	19-033330-000D		DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	Printer	Pwr Sply,Rcpt Prntr	19-040046-000A	Receipt printer power supply	DT1,1.5
02 DT	DT 1.0 / 00-101620-000A/B	Printer	Receipt printer paper box of 50	19-040047-000A	Diebold Direct Part# is 51034A Epson TM-T88IIP paper type : Specified thermal paper Paper width: 3.15 inches roll size: 83mm maximum Specified thermal roll paper NTP080-80 Paper roll spool diameter inside 12mm outside 18mm	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	Printer	Receipt Printer	19-040114-000A	Printer only, cable and power supply are separate parts	DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	UPS	DT UPS Battery	29-013701-000A		DT1,1.5,2,2.5
02 DT	DT 1.0 / 00-101620-000A/B	UPS	UPS	39-013764-000A	Standard with DT 1.5 and 2.0	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	IB Module	00-101629-000A	replaced by 00-101653-000A	DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	IB Hub Kit	00-101653-000A	also replaces IB module 00-101629-000A; 00-101629-000A Rev 4 can be used up to replace any 00-101629-000A (can not replace 00-101653-000A)	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	CCA Ethernet	19-040146-000A		
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	CCA Token ring	19-040185-000A	IBM	
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	CA Lgc, RS232, Quad, DT 1.5 Globetek	19-040196-000A	Short quad cable that fits Globetek serial port CCA (only fits on globtek CCA)	DT1.5,2
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	CCA, Ser I/O Async, Quad, RS232	21-017574-000A	Globetek serial I/O CCA do not order unless you are replacing a Globetek CCA	
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	CA Lgc, RS232, Quad, DT 1.5 Globetek	21-017574-000A	Globetek Serial CCA	DT1.5,2
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	Computer Mount	49-014546-000A		DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-CPU	computer	see computer table	see computer table	
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Security/Vanity Shield, DT	19-040016-000A	Hangs by screws not snap on	DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Card reader std track 2	19-040063-000A	Credit card standards,magnetic	DT1,1.5,2,2.5

02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Card reader	19-040063-000B	Customized version,magnetic	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Card reader track 3	19-040063-000C	Magnetic	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Bar code reader	19-040089-000A	Bar code symbologies Infrared	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Logic cable for barcode reader	19-040090-000A		DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Keyboard wedge for barcode	19-040091-000A	Programmed decoder	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Keyboard Tray	19-040093-000A		DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Keyboard support hinge	19-040148-000A	Kbd tray hinge	DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	MicroTouch Touchscreen	19-040163-000A		
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	MicroTouch Touchscreen	19-040163-000A		DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Extension pivot arm	19-040169-000A		DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Cable, Power Supply	19-040170-000A		
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Power Supply, DT, 1.5, LCD	19-040171-000A		
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Keyboard Hinge Kit	19-040259-000A	includes support arm, brackets and fasteners	DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	Keyboard (Qwerty)	49-012027-000Q		
02 DT	DT 1.5 / 00-101635-000A/B	DT-UI	CA,LGC,SER EXTN,15FT,DB9	39-014087-000A	DT-CPU to DT-UI or DT-CPU to IB Hub/Module	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	Printer	CA, Lgc, pri Prntr, 15ft	19-033330-000D	receipt printer cable (not included with printer)	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	Printer	Parallel printer cable, 15ft	19-033330-000D		DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	Printer	Pwr Sply,Rcpt Printr	19-040046-000A	Receipt printer power supply	DT1,1.5
02 DT	DT 1.5 / 00-101635-000A/B	Printer	Receipt printer paper box of 50	19-040047-000A	Diebold Direct Part# is 51034A Epson TM-T88IIP paper type : Specified thermal paper Paper width: 3.15 inches roll size: 83mm maximum Specified thermal roll paper NTP080-80 Paper roll spool diameter inside 12mm outside 18mm	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	Printer	Receipt Printer	19-040114-000A	Printer only, cable and power supply are separate parts	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	UPS	DT UPS Battery	29-013701-000A		DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101635-000A/B	UPS	UPS	39-013764-000A	Standard with DT 1.5 and 2.0	DT1,1.5,2,2.5
02 DT	DT 1.5 / 00-101652-000A/B DT 1.5 / 00-101652-100A/B	DT-CPU Upgrade	computer	see computer table	see computer table	

02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-CPU	IB Hub Kit	00-101653-000A	also replaces IB module 00-101629-000A; 00-101629-000A Rev 4 can be used up to replace any 00-101629-000A (can not replace 00-101653-000A)	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-CPU	IB Repeater Kit	00-101653-000B		
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D	DT-CPU	CA Lgc, RS232, Quad, DT 1.5 Globetek	19-040196-000A	Short quad cable that fits Globetek serial port CCA (only fits on globtec CCA)	DT1.5,2
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D	DT-CPU	DT Ethernet CPU	19-040201-000A	Few Used CPU HP D9807E VLI8 128MB, 550MHZ Win2K PIII Release Date 4/10/00	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D	DT-CPU	CA Lgc, RS232, Quad, DT 1.5 Globetek	21-017574-000A	Globetek Serial CCA	DT1.5,2
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-CPU	Computer Mount	49-014546-000A		DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D	DT-CPU	Internal power cable w/bracket	49-021159-000A	12.0V from CPU pwr supply to TS	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-CPU	computer	see computer table	see computer table	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Card reader std track 2	19-040063-000A	Credit card standards,magnetic	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Card reader	19-040063-000B	Customized version,magnetic	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Card reader track 3	19-040063-000C	Magnetic	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Bar code reader	19-040089-000A	Bar code symbologies Infrared	DT1,1.5,2,2.5

02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Logic cable for barcode reader	19-040090-000A		DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Keyboard wedge for barcode	19-040091-000A	Programmed decoder	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	DT Flush Mount Kit	19-040227-000A	Only available via 500 order if parts are missing in the order.	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Kbd cable ext	39-014086-000A	CPU to UI (part of cable bundle)	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	CA,LGC,SER EXTN,15FT,DB9	39-014087-000A	DT-CPU to DT-UI or DT-CPU to IB Hub/Module	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Video cable ext	39-014088-000A	CPU to UI	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Pwr cable ext	49-017188-000A	12v for touchscreen, CPU to LCD	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Keyboard	49-017199-000A	QWERTY,compact 101key, PS2	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Cable bundle kit DT-UI	49-017200-000A	Cable asm for DT-UI to	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Torque hinge	49-017201-000A	DT-UI pivot	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Keyboard kit	49-021169-000A	Kybd with velcro strips attached	

02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Monitor kit	49-021170-000B	From old or new monitor style to old monitor style (3 front buttons)	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Monitor kit	19-040270-000A	From old or new monitor style to new monitor style (5 front buttons)	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	DT-UI	Velcro	88-040047-0067	Secures kbd and monitor	
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	Printer	CA, Lgc, prl Prntr, 15ft	19-033330-000D	receipt printer cable (not included with printer)	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	Printer	Parallel printer cable, 15ft	19-033330-000D		DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	Printer	Receipt printer paper box of 50	19-040047-000A	Diebold Direct Part# is 51034A Epson TM-T88IIP paper type : Specified thermal paper Paper width: 3.15 inches roll size: 83mm maximum Specified thermal roll paper NTP080-80 Paper roll spool diameter inside 12mm outside 18mm	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	Printer	Receipt Printer	19-040114-000A	Printer only, cable and power supply are separate parts	DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	UPS	DT UPS Battery	29-013701-000A		DT1,1.5,2,2.5
02 DT	DT 2.0 / 00-101645-000A/B DT 2.0 / 00-101645-000C/D DT 2.5 / 00-101655-000A/B	UPS	UPS	39-013764-000A	Standard with DT 1.5 and 2.0	DT1,1.5,2,2.5
02 DT	DT 2.5 / 00-101655-000A/B	DT-CPU	Internal power cable w/bracket	49-021284-000A	12.0V from CPU pwr supply to TS	
02 DT	DT 2.5 / 00-101655-000A/B	DT-CPU	computer	see computer table	see computer table	
03 Workstation	Centrack	CT-UI	MON,VID,LCD,FLAT PANEL,15 IN	19-040280-000A		

03 Workstation	Centrack	CT-CPU	computer	see computer table	see computer table	
04 UDM	UDM 00-101463-000A	Cabinet	PROM,Controller,I/O,UDM	19-038342-000H	use up then use 19-038342-000N	UDM
04 UDM	UDM 00-101463-000A	Cabinet	Polyswitch	19-038428-000B	Part of FCO 249, polyswitch F1 on I/O CCA for UDM lock	
04 UDM	UDM 00-101463-000A	Cabinet	CCA Kit,Controller,I/O,UDM	19-040027-000A	use up then use 19-040161-000A	UDM
04 UDM	UDM 00-101463-000A	Cabinet	Cable power and logic coiled	29-010332-000C		UDM
04 UDM	UDM 00-101463-000A	Cabinet	CA,PWR & LGC,INTL,RGTR ADPTR	29-010444-000D		UDM
04 UDM	UDM 00-101463-000A	Cabinet	Switch and Connector	29-010730-000B		
04 UDM	UDM 00-101463-000A	Cabinet	CAM,LOCK,UDM	29-010738-000A	cam for door lock	UDM
04 UDM	UDM 00-101463-000A	Cabinet	LOCK,TBLR KY,07 PIN/DUAL,CW	29-012152-000A	Barrel Lock and 2 keys	UDM,SCM
04 UDM	UDM 00-101463-000A	Cabinet	LATCH,RTRY,W/PAWL ACTR,1 STG,LH	39-011342-000E	latch assy for cabinet door	UDM,SCM
04 UDM	UDM 00-101463-000A	Cabinet	SOL,DC,LIN,024.0V,INTMT,PULL	39-013163-000A	door latch solenoid	UDM
04 UDM	UDM 00-101463-000A	Cabinet	CCA,Controller,IO,UDM	49-010547-000A		UDM
04 UDM	UDM 00-101463-000A	Cabinet	SLIDE,EXTN,3 SECT,12.00	49-010775-000B	Shelf slide	UDM
04 UDM	UDM 00-101463-000A	Cabinet	Lid, Drop Chute, UDM	49-017148-000A		
04 UDM	UDM 00-101463-000A	Cabinet	UDM Door	49-170003-000A		
04 UDM	UDM 00-101463-000A	Bin Shelf	Fuse, 1.5A, 125v	19-019005-008A		
04 UDM	UDM 00-101463-000A	Bin Shelf	CCA KIT,Controller,BIN Shelf	19-038313-000A	use up then use 19-040157-000A	UDM
04 UDM	UDM 00-101463-000A	Bin Shelf	PROM,Controller,BIN Shelf	19-038342-000E	use up then use kit 19-040157-000A	UDM
04 UDM	UDM 00-101463-000A	Bin Shelf	SOL,DC,LIN,024.0V,INTMT,PULL	29-010414-000B		UDM
04 UDM	UDM 00-101463-000A	Bin Shelf	Bin, Large	39-011593-000A	replacement part is 49-014567-000D	
04 UDM	UDM 00-101463-000A	Bin Shelf	Bin, Small	39-011593-000B	replacement part is 49-014567-000B	
04 UDM	UDM 00-101463-000A	Bin Shelf	Bin, Medium	39-011593-000C	replacement part is 49-014567-000C	
04 UDM	UDM 00-101463-000A	Bin Shelf	CCA,Controller,BIN Shelf	49-010037-000A	use up then use 49-014581-000A	UDM
04 UDM	UDM 00-101463-000A	Helix Shelf	CCA KIT,Controller,HELIX Shelf	19-038215-000A	use up then use 19-040156-000A	UDM
04 UDM	UDM 00-101463-000A	Helix Shelf	PROM,Controller,HELIX Shelf	19-038342-000G	use up then use kit 19-040156-000A	UDM
04 UDM	UDM 00-101463-000A	Helix Shelf	LABEL MT KIT,HELIX SHELF,UDM	19-040164-000A	includes mounting brackets	
04 UDM	UDM 00-101463-000A	Helix Shelf	Switch and Connector	29-010730-000A		UDM
04 UDM	UDM 00-	Helix Shelf	MOTOR,DC,24 V	29-010733-		UDM

	101463-000A			000A		
04 UDM	UDM 00-101463-000A	Helix Shelf	Retainer Wire, Oral Dispenser/Helix	29-010740-000A/B	A is the long (Helix oral) and B is the short (Helix inj)	
04 UDM	UDM 00-101463-000A	Helix Shelf	Helix, 1.0in, 20 Cap	39-011612-000A		
04 UDM	UDM 00-101463-000A	Helix Shelf	Helix, 1.0in, 15 Cap	39-011612-000B		
04 UDM	UDM 00-101463-000A	Helix Shelf	Helix, 1.0in, 10 Cap	39-011612-000C		
04 UDM	UDM 00-101463-000A	Helix Shelf	Helix, 1.0in, 8 Cap	39-011612-000D		
04 UDM	UDM 00-101463-000A	Helix Shelf	CPLR,MOT,ORAL DISPR	39-011622-000A	motor/helix coupler - black is new, shadow gray is old	UDM
04 UDM	UDM 00-101463-000A	Helix Shelf	Helix, 1.4in, 20 Cap	39-011626-000A		
04 UDM	UDM 00-101463-000A	Helix Shelf	Helix, 1.4in, 15 Cap	39-011626-000B		
04 UDM	UDM 00-101463-000A	Helix Shelf	Helix, 1.4in, 10 Cap	39-011626-000C		
04 UDM	UDM 00-101463-000A	Helix Shelf	CCA,Controller,HELIX Shelf	49-010536-000A	use up then use 49-014584-000A	UDM
04 UDM	UDM 00-101463-000A	Helix Shelf	MT,LABEL,HELIX SHELF,UDM	49-014578-000A		UDM
04 UDM	UDM 00-101640-000A	Cabinet	PROM,Controller,I/O,UDM	19-038342-000N		UDM
04 UDM	UDM 00-101640-000A	Cabinet	CCA KIT,Controller,I/O,UDM	19-040161-000A		UDM
04 UDM	UDM 00-101640-000A	Cabinet	CA,PWR & LGC,COILED,SHELF	29-010332-000C		UDM
04 UDM	UDM 00-101640-000A	Cabinet	CA,PWR & LGC,INTL,RGTR ADPTR	29-010444-000D		UDM
04 UDM	UDM 00-101640-000A	Cabinet	CAM,LOCK,UDM	29-010738-000A	cam for door lock	UDM
04 UDM	UDM 00-101640-000A	Cabinet	LOCK,TBLR KY,07 PIN/DUAL,CW	29-012152-000A	Barrel Lock and 2 keys	UDM,SCM
04 UDM	UDM 00-101640-000A	Cabinet	SW,PLGR,2 FORM C,QDISC,MOM	29-012957-000A		SCM
04 UDM	UDM 00-101640-000A	Cabinet	LATCH,RTRY,W/PAWL ACTR,1 STG,LH	39-011342-000E	latch assy for cabinet door	UDM,SCM
04 UDM	UDM 00-101640-000A	Cabinet	SOL,DC,LIN,024.0V,INTMT,PULL	39-013163-000A	door latch solenoid	UDM
04 UDM	UDM 00-101640-000A	Cabinet	CCA,Controller,IO,UDM	49-010547-000A		UDM
04 UDM	UDM 00-101640-000A	Cabinet	SLIDE,EXTN,3 SECT,12.00	49-010775-000B	Shelf slide	UDM
04 UDM	UDM 00-101640-000A	Cabinet	CA,PWR,SOL & SW,COV,UDM	49-014575-000A		
04 UDM	UDM 00-101640-000A	Cabinet	DEFL,PAD,DROP CHUTE,UDM	49-017177-000A	plastic deflector must be added to the drop chute if the rear pad does not protrude through the back of the drop chute	
04 UDM	UDM 00-101640-000A	Bin Shelf	PROM,Controller,BIN Shelf	19-038342-000L		
04 UDM	UDM 00-101640-000A	Bin Shelf	CCA KIT,Controller,BIN Shelf	19-040157-000A		UDM

04 UDM	UDM 00-101640-000A	Bin Shelf	SOL,DC,LIN,024.0V,INTMT,PULL	29-010414-000B		UDM
04 UDM	UDM 00-101640-000A	Bin Shelf	BIN,INJ,small	49-014567-000B	replaces the older bin 39-011593-000B (no LED)	UDM
04 UDM	UDM 00-101640-000A	Bin Shelf	BIN,INJ,medium	49-014567-000C	replaces the older bin 39-011593-000C (no LED)	UDM
04 UDM	UDM 00-101640-000A	Bin Shelf	BIN,INJ,extra-large	49-014567-000D	replaces the older bin 39-011593-000A (no LED) and the large bin 49-014567-000A	UDM
04 UDM	UDM 00-101640-000A	Bin Shelf	CCA,Controller,BIN Shelf	49-014581-000A		UDM
04 UDM	UDM 00-101640-000A	Bin Shelf	SOL & LED,INJ BIN	49-014596-000A		
04 UDM	UDM 00-101640-000A	Helix Shelf	PROM,Controller,HELIX Shelf	19-038342-000M		
04 UDM	UDM 00-101640-000A	Helix Shelf	CCA KIT,Controller,HELIX Shelf	19-040156-000A		UDM
04 UDM	UDM 00-101640-000A	Helix Shelf	INJ HELIX KIT,1, 2, OR 3 ML VI	19-040159-000A		
04 UDM	UDM 00-101640-000A	Helix Shelf	INJ HELIX KIT,5 OR 6 ML VIALS	19-040159-000B		
04 UDM	UDM 00-101640-000A	Helix Shelf	INJ HELIX KIT,5 ML AMPS WITH 1	19-040159-000C		
04 UDM	UDM 00-101640-000A	Helix Shelf	INJ HELIX KIT,5 ML AMPS WITH 2	19-040159-000D		
04 UDM	UDM 00-101640-000A	Helix Shelf	Switch and Connector	29-010730-000A		UDM
04 UDM	UDM 00-101640-000A	Helix Shelf	MOTOR,DC,24 V	29-010733-000A		UDM
04 UDM	UDM 00-101640-000A	Helix Shelf	CPLR,MOT,ORAL DISPR	39-011622-000A	motor/helix coupler - black is new, shadow gray is old	UDM
04 UDM	UDM 00-101640-000A	Helix Shelf	DVDR,PERM,HELIX SHELF	49-014526-000A		
04 UDM	UDM 00-101640-000A	Helix Shelf	RTNR,HELIX,ORAL,HELIX SHELF	49-014529-000A/B	A has the longer short arm (Oral Helix) and B has the shorter short arm (Injectable Helix). The B is always required when a medication limit is used.	
04 UDM	UDM 00-101640-000A	Helix Shelf	HELIX,DISPR,24 CAP,1.00 IN OD,HELIX SHELF	49-014534-000A		
04 UDM	UDM 00-101640-000A	Helix Shelf	HELIX,DISPR,18 CAP,1.00 IN OD,HELIX SHELF	49-014534-000B		
04 UDM	UDM 00-101640-000A	Helix Shelf	HELIX,DISPR,12 CAP,1.00 IN OD,HELIX SHELF	49-014534-000C		
04 UDM	UDM 00-101640-000A	Helix Shelf	HELIX,DISPR,9 CAP,1.00 IN OD,HELIX SHELF	49-014534-000D		

04 UDM	UDM 00-101640-000A	Helix Shelf	HELIX,DISPR,24 CAP,1.40 IN OD,HELIX SHELF	49-014535-000A		
04 UDM	UDM 00-101640-000A	Helix Shelf	HELIX,DISPR,18 CAP,1.40 IN OD,HELIX SHELF	49-014535-000B		
04 UDM	UDM 00-101640-000A	Helix Shelf	HELIX,DISPR,12 CAP,1.40 IN OD,HELIX SHELF	49-014535-000C		
04 UDM	UDM 00-101640-000A	Helix Shelf	CCA,INDICATOR,HELIX SHELF	49-014540-000A		
04 UDM	UDM 00-101640-000A	Helix Shelf	CA,LGC,FLEX CKT,008 CKT,11.00 IN,1 TO 1	49-014573-000A		
04 UDM	UDM 00-101640-000A	Helix Shelf	MT,LABEL,HELIX SHELF,UDM	49-014578-000A		UDM
04 UDM	UDM 00-101640-000A	Helix Shelf	CCA,Controller,HELIX Shelf	49-014584-000A		UDM
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Fuse, 2A, 250v	11-025570-000P		
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Controller CCA PROM	19-038342-000F		
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Striker	21-016877-000B		
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Drawer divider, "A" drawer	29-010753-000A		
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Drawer divider, "B" drawer	29-010754-000A		
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	SHLD,MEDICATION,LG,DWR MDL	29-010771-000A	for medium drawer	
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	SHLD,MEDICATION,SM,DWR MDL	29-010772-000A	for small drawer	
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Solenoid/Latch Asm	31-018417-000A		
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	CA, Pwr & Lgc,Cntrl Bds	41-015222-000A	wiring harness for old DM all 5 cables to the drawer assys are on one	
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Slide Asm	41-015249-000A	"A" drawer 3 section slide	DM
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Slide Asm	41-015343-000A	Return drawer slide	DM

05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Controller CCA	49-010040-000A		
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Small Drawer liner kit	19-040060-000A	replacement part for white liners	DM
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Medium Drawer liner kit	19-040060-000B	replacement part for white liners	DM
05 DM/CDM/MDM	DM 1.0 / 00-101603-000A/F MDM 1.0 / 00-101468-000A/D	Drawer Assembly	Large Drawer liner kit	19-040060-000C	replacement part for white liners	DM
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Cabinet	Cable, power/logic, five lengths	29-010775-000A-E		
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	PROM,DRW ASSY	19-038342-000J		
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	CCA w/PROM	19-040070-000A		
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Extension Spring	21-016935-000C	Spring that fits inside slide assy	
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Holder, Mag, Asm A-B drawer	29-010764-000A		
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Holder, Mag, Asm C drawer	29-010765-000A		
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Solenoid Latch Assy, DM	29-010776-000A		
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Striker	29-010781-000A		
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A	Drawer Assembly	Cable, power/logic RTRV Large	39-011680-000A		

	MDM / 00-101605-000A					
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Controller CCA	49-012768-000A	for A thru F drawers	
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Controller CCA	49-012768-000B	for G drawer	
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Small Drawer liner kit	19-040060-000A		DM
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Medium Drawer liner kit	19-040060-000B		DM
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Large Drawer liner kit	19-040060-000C		DM
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	SPR,RET,LGE	29-010779-000A	for large return drawer (F)	
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Slide Asm	41-015249-000A	"A" drawer 3 section slide	DM
05 DM/CDM/MDM	DM 1.5 / 00-101604-000A CDM / 00-101607-000A MDM / 00-101605-000A	Drawer Assembly	Slide Asm	41-015343-000A	Return drawer slide	DM
06 SCM	SCM 00-101611-000B	Cabinet	Screws for door	12-001063-0150		
06 SCM	SCM 00-101611-000B	Cabinet	Brkt, Strike, SCM	29-010782-000B	Door strike bracket on SCM (slotted mounting holes) Adjustable	
06 SCM	SCM 00-101611-000B	Cabinet	Supply cabinet door window	39-011686-000A		
06 SCM	SCM 00-101611-000B	Cabinet	solenoid; dc, lin, 24v	39-013368-000A	Door latch solenoid	
06 SCM	SCM 00-101611-000B	Cabinet	Stainless steel hinge	39-013609-000B	replaced by 39-013609-000C	
06 SCM	SCM 00-101611-000B	Cabinet	3-Hole Stainless Steel Hinge	39-013609-000C		

06 SCM	SCM 00-101611-000B	Cabinet	RH, supply cabinet slide	39-013610-000A		
06 SCM	SCM 00-101611-000B	Cabinet	LH, supply cabinet slide	39-013610-000B		
06 SCM	SCM 00-101611-000B	Cabinet	LOCK,TBLR KY,07 PIN/DUAL,CW	29-012152-000A	Barrel Lock and 2 keys	UDM
06 SCM	SCM 00-101611-000B	Cabinet	LATCH,RTRY,W/PAWL ACTR,1 STG,LH	39-011342-000E	latch assy for cabinet door	UDM
06 SCM	SCM 00-101611-000B	Cabinet	Cable, pwr & lgc, sol & sw, supply cabinet	39-013611-000A		
06 SCM	SCM 00-101611-000B	Cabinet	Supply cabinet whole door with window (NOT IN SPINS)	49-012823-000A	not a spins part, special ordre	
06 SCM	SCM 00-101611-000B	Shelf	Clip, Fixed Shelf	02-025967-0000		
07 ELM	ELM 00-101627-000A/B		El. Lock cntrl CCA, Prom	19-038342-000K		
07 ELM	ELM 00-101627-000A/B		SPR,EXTN	19-040578-000A	strike latch to solenoid latch	
07 ELM	ELM 00-101627-000A/B		SPR,HLCL,EXTN	19-042002-000A	solenoid to solenoid latch; replaces 19-040579-000A	
07 ELM	ELM 00-101627-000A/B		Cover Gasket	29-010812-000A	for -000A ELM only	
07 ELM	ELM 00-101627-000A/B		Label, Product, ELM	29-010813-000A	Label that is on strike brkt cover	
07 ELM	ELM 00-101627-000A/B		LOCK,TBLR KY,07 PIN/DUAL,CW	29-012152-000A	Barrel Lock and 2 keys	
07 ELM	ELM 00-101627-000A/B		Scr, Cap, Btnhd, Tmpr Prf/Skt	29-013039-000A	Strike brkt security screws 6-32 x 0.38	
07 ELM	ELM 00-101627-000A/B		Solenoid, DC, 24v	39-013359-000A		
07 ELM	ELM 00-101627-000A/B		Cable, power and logic	39-013607-000A	Cable manufacturer-Belden(p/n YR22177). #18 awg, 5-conductors, unshielded. SPINS# for cable assembly is 39-013607-A. Diebold# for cable alone 91-018051-5262.	
07 ELM	ELM 00-101627-000A/B		CCA,CNTRL,ELC	49-014502-000A		
07 ELM	ELM 00-101627-000A/B		BARRIER,FISH PAPER,ELC	49-014522-000A		
07 ELM	ELM 00-101627-000A/B		PL,MT,ADH,ELM	49-021203-000A		
08 ELC	ELC 00-101625-000A		PROM,ELC	19-038342-000K	PROM does not come with board	
08 ELC	ELC 00-101625-000A		CCA,ELC	49-014502-000A	Board does not come with PROM	
09 SST	SST 00-101646-000A/B	Cabinet	CCA Lock Controller Kit	19-040186-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Diode mounting ring	29-013202-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Diode mounting clip	29-013397-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Lock Set	29-013775-000A	Includes 4 locks	
09 SST	SST 00-101646-000A/B	Cabinet	Rocker switch AC	39-009916-000A		

09 SST	SST 00-101646-000A/B	Cabinet	Ballast w/conn	39-014030-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Catch/Switch	39-014095-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Lock/switch pwr&logic cable	49-017088-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Hinge End A	49-017097-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Hinge Mid	49-017097-000B		
09 SST	SST 00-101646-000A/B	Cabinet	Hinge End B	49-017097-000C		
09 SST	SST 00-101646-000A/B	Cabinet	Internal Pwr and logic cable	49-017139-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Latch	49-017165-000A		
09 SST	SST 00-101646-000A/B	Cabinet	Temporary Mount	49-017178-000A	Used when cabinet not permanently mounted	
09 SST	SST 00-101646-000A/B	Cabinet	Lock Cable LED & Resistor	49-021228-000A		
09 SST	SST 00-101646-000A/B	Shelf	CCA Shelf Controller Kit	19-040192-000A		
09 SST	SST 00-101646-000A/B	Shelf	Slide & Bracket, LH	49-017075-000A		
09 SST	SST 00-101646-000A/B	Shelf	Slide & Bracket, RH	49-017075-000B		
09 SST	SST 00-101646-000A/B	Shelf	Shelf coiled cable	49-017091-000A		
09 SST	SST 00-101646-000A/B	Shelf	Shelf intl pwr&logic cable	49-017145-000A		
09 SST	SST 00-101646-000A/B	Shelf	Shelf labels	49-017174-000A		
10 General	Common Misc Parts	Cable	CA,PWR,AC,INLET,N AMER	00-101315-000L	IB hub to computer power cable	
10 General	Common Misc Parts	Cable	CA,PWR & LGC,EXTL,CAB INTCON	00-101608-000A	A=4.5, B=20ft - module to module, connectors attached on both ends	
10 General	Common Misc Parts	Cable	CA,PWR & LGC,CAB INTCON	00-101609-000A-C	A=5 ft, B=20ft, C=100 ft - module to module, connector attached on one end, one separate	
10 General	Common Misc Parts	Cable	CA,PWR & LGC,DSPL TERM KIT	00-101610-000A	A=15 ft, B=50ft - IB hub to module, IB hub connector separate	
10 General	Common Misc Parts	Cable	CA,VID,MON EXT,TTL,06 FT	19-033333-000A	6' serial cable extension for IrDA receiver & UPS	
10 General	Common Misc Parts	Cable	Pins, connector	29-010890-000A	for power and logic cable end to devices	
10 General	Common Misc Parts	Cable	Connector	39-011801-000A	for power and logic cable end to devices	
10 General	Common Misc Parts	Cable	Clamp, Connector	39-011809-000A	for power and logic cable end to devices	
10 General	Common Misc Parts	Cable	CA,PWR,AC,EXTN	39-013335-000A	6' power cable extension	
10 General	Common Misc Parts	Cable	15' VGA cable	39-014088-000A	From UI (touchscreen) to CPU 2.0 part also	
10 General	Common Misc Parts	Cable	TUBING,PLYETHN,0.750 ID,BLK	88-040037-0067	3/4" cable housing, specified by the linear foot	

10 General	Common Misc Parts	Mounting	Lag Bolt 31 x 2.00	19-038677-000A		
10 General	Common Misc Parts	Mounting	Toggle Bolt, RDH, 25 x 3.00	19-038684-000A		
10 General	Common Misc Parts	Mounting	Hold Down Kit Medselect	21-016987-000A	DM hold down kit anchors etc.	
10 General	Common Misc Parts	Paint	Touch-up paint	11-033796-000U	Pearl White, 1/2 pint can	
10 General	Common Misc Parts	Paint	Touch-up paint	19-038715-000A	Pearl White, spray can	
10 General	Common Misc Parts	Tool	Security bit .156	19-038759-000A	You may want to order the VAT part that includes the handle part# 11-035661-000A	
10 General	Common Misc Parts	Tool	Medselect Tool Kit	19-040020-000D		
10 General	Common Misc Parts	Tool	Anchor setting tool	19-041416-000A		
10 General	Common Misc Parts	Tool	Serial Port DB9 loopback plug	29-012221-000A	To test com ports with hyperterminal	
10 General	Common Misc Parts	Tool	Security bit .125	29-013205-000A	ELM and DT1.5 mount	
11 Documentation	Service Guides	1	Service Documentation Kit	19-040177-000A		
11 Documentation	Service Guides	Installation	Software and Computer Configuration Guide	TM-MEDSFT-000X	needs updating	
11 Documentation	Service Guides	Installation	DT-CPU Upgrade Intallation Guide	TM-DTUP15-000F		
11 Documentation	Service Guides	Installation	Installing the High Capacity UDM Injectables Helix Kit	TM-INJHCH-000B		
11 Documentation	Service Guides	Installation	Installing the Unit Dose Module Injectables Helix Kit	TM-INJHLX-000B		
11 Documentation	Service Guides	Installation	High Capacity UDM Solids Dispenser Double Position	TM-MEDDBL-000B		
11 Documentation	Service Guides	Installation	Installation Guide	TM-MEDINS-000D		
11 Documentation	Service Guides	Installation	Installation of Security Contact Points on MedSelect Dispensing Modules	TM-MEDSCP-000B		
11 Documentation	Service Guides	Installation	Standard Capacity UDM Solids Dispenser Double Position Installation Guide	TM-MSDBL1-000B		
11 Documentation	Service Guides	Installation	Display Terminal 1.5 Installation Guide	TM-MSDT15-000B		
11 Documentation	Service Guides	Installation	Thermal Printer Installation Guide	TM-TMT88P-000C		
11 Documentation	Service Guides	Installation	Product Cut Sheet Set	19-040178-000A		
11 Documentation	Service Guides	Service	Service Guide	TM-MEDSVC-000E		

11 Documentation	User Guides	DT	MedSelect Display Terminal Dispensing Guide	TP-799955-001G		
11 Documentation	User Guides	DT	SupplySource Display Terminal Dispensing Guide	TP-820492-001B		
11 Documentation	User Guides	Server	Server Administration Guide	TP-820084-001D		
11 Documentation	User Guides	Workstation	Administrative WorkStation (AWS) User's Guide	TP-799956-001F		
11 Documentation	User Guides	Workstation	SmartStock User's Guide	TP-820176-001C		
11 Documentation	User Guides	Workstation	MedSelect Restocker's Guide	TP-820387-001B		
11 Documentation	User Guides	Workstation	Examiner User's Guide	TP-820126-001C		
11 Documentation	User Guides	Workstation	Nursing WorkStation User's Guide	TP-820388-001C		
11 Documentation	User Guides	Workstation	Control Center User's Guide	TP-820487-001B		
11 Documentation	User Guides	Workstation	SupplySource Restocker's Guide	TP-820502-001C		

16.2 DT SUMMARY TABLE

Computer Service Part Reference			<i>Lasted design-engineering-released part is red and italicized.</i>						
			For -000X/Y, Ethernet is first (e.g. -000A), Token Ring is second (e.g. -000B)						
Primary Identification			Secondary Identification					Use to find Replacement PC	
Equivalent Service P/N (ID may not exist on PC)	Vendor	Model	OS	Memory (Mb)	Processor	Speed (MHz)	Ports	Service P/N	Service Notes
19-040039-000A	Datalux	Databrick	Win 95	32	486	100	2 S	19-040039-000A	none
19-040137-000A	HP	Vectra VL7 5720A	Win 95	32	P2	266	1 S, 2 USB	19-040137-000A 19-040201-000A/B 19-040249-000A/B 19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
19-040137-000A	HP	Vectra VL8 5880T	Win 95	32	P2	350	1 S, 2 USB	19-040137-000A 19-040201-000A/B 19-040249-000A/B 19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
19-040137-000A	HP	Vectra VLi8 D7951T	Win 95	64	P3	450	2 S, 2 USB	19-040137-000A 19-040201-000A/B 19-040249-000A/B 19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
19-040201-000E/F	HP	Vectra VLi8 D9807E	Win NT4	64	P3	550	2 S, 2 USB	19-040201-000E/F 19-040201-000A/B 19-040249-000A/B 19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
19-040201-000A/B	HP	Vectra VLi8 D9807E	Win 2000	128	P3	550	2 S, 2 USB	19-040201-000A/B 19-040249-000A/B 19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
19-040249-000A/B	HP	Vectra VL400 D9861E	Win 2000	128	P3	733	2 S, 2 USB	19-040249-000A/B 19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
19-040249-000E/F	HP	Vectra VL400 D9861E	Win NT4	128	P3	733	2 S, 2 USB	19-040249-000E/F 19-040249-000A/B 19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
19-040256-000A/B	HP	Vectra VL400 D9861E	Win 2000	128	P3	1000	2 S, 2 USB	19-040256-000A/B 19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.

Computer Service Part Reference			<i>Lasted design-engineering-released part is red and italicized.</i>						
			For -000X/Y, Ethernet is first (e.g. -000A), Token Ring is second (e.g. -000B)						
Primary Identification			Secondary Identification					Use to find Replacement PC	
Equivalent Service P/N (ID may not exist on PC)	Vendor	Model	OS	Memory (Mb)	Processor	Speed (MHz)	Ports	Service P/N	Service Notes
19-040256-000J/K CAUTION - Use to Replace VL420 Only	HP	Vectra VL420 A8386T	Win 2000	256	P4	1800	2 S, 4 USB	19-040256-000G/H 19-040256-000J/K 19-040256-000S	19-040256-000S Call Support for Token Ring. Use 19-040256-000J/K to Replace VL420 Only.
19-040256-000G/H	Dell	Optiplex GX240	Win 2000	128	P4	1600	2 S, 4 USB	19-040256-000G/H 19-040256-000S	19-040256-000S Call Support for Token Ring.
<i>19-040256-000S</i>	<i>Dell</i>	<i>Optiplex GX260</i>	<i>Win 2000</i>	<i>128 or 256</i>	<i>P4</i>	<i>1600</i>	<i>1 S, 6 USB</i>	<i>19-040256-000S</i>	<i>19-040256-000S Call Support for Token Ring.</i>

17. Support Information

17.1 Technical Inquiries

The following support information is provided for the convenience of service personnel. This information (phone numbers, etc.) is the latest as per publication date of this manual.

17.2 Technical Inquiries and Support

For technical information or support concerning this product, please contact or forward all inquiries to the following number:

MedSelect Customer Support Center

Phone: 1-800-508-4576

17.3 Requesting Replacement Keys or Locks

For replacements of keys and locks contact Diebold Banklock. Banklock is responsible for all logistics concerning keys and locks.

Diebold Banklock

Phone: 330-769-6114 (COMNET: 224-6114)

FAX: 330-769-6125 (COMNET 224-6125)

17.4 On-Line MedSelect Documentation

MedSelect documentation is available on-line. A selection of documents is available at every customer site. The following sections explain how to access this information.

17.5 Accessing Documentation at Customer's Site

Some MedSelect documentation, including this Service Guide, is available on-line at a customer site, and this documentation can be accessed from any Display Terminal or AWS computer. MedSelect uploads new documentation to a customer site any time that customer's software is updated. Therefore, on-line documentation is guaranteed to be the most current documentation available.

17.5.1 Accessing Information from a Display Terminal

You can access the on-line documentation from any Display Terminal. Follow these steps:

1. Press **Alt+Esc** to bring up the Windows Task bar (**Ctrl+Esc** for Windows NT and 2000).
2. Press the **Start** button.
3. Select **Programs**, and then select **Internet Explorer**.
4. Enter the following URL address for this documentation:

`http://medsvr/`

To gain password protect access to any of these documents, see **Passwords for Documentation Access**, below.

17.5.2 Accessing Information from an AWS Computer

You can access the on-line documentation from any AWS computer that is also running web browser software (such as Netscape or Internet Explorer). The web browser must be configured to work on the same network as the MedSelect System server. Any configuration of this type should be done by the customer.

To access the on-line documentation, open the web browser, and then enter the following URL address for the documentation:

`http://medsvr/`

17.5.3 Passwords for Documentation Access

Some MedSelect on-line documents are password protected. To access a document, you must provide a user name and a password. For each document, this user information is determined as follows:

- The user name is an abbreviated name for the manual. This is the same name that appears in the prompt for the user information.
- The password is the same as the username with 16066 added to the end.

For instance, if you attempt to access the *Service Guide*, you are prompted with the message shown in Figure 17-1:

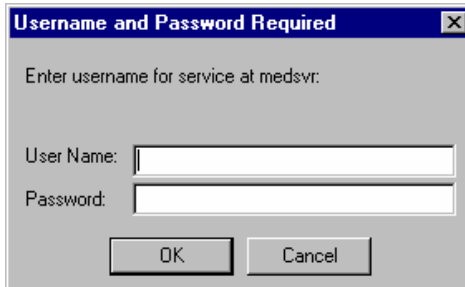


Figure 17-1 User and Password Fields

In the prompt line, you are requested to enter a username for **service**. Therefore, **service** is the abbreviated name of the manual, and it is the name you should use for the user name. The password is **service16066**.

Index

A

acronyms, 2
address querying, 19

B

bar code reader, 36
barcode, 5
bin releasing mechanism, 77

C

cabling, 10
card (CCA) identification, 6
card reader, 27
chute, 108
coiled cable, 67, 73
computer assembly, 27, 32, 33, 45
connectors, 10
continuity checks, 24
controller, 6, 107, 113
controller address, 6
controller addresses, 6
controller CCA, 6
counterclockwise helix, 85

D

data collision, 11
database server, 11
daughter board, 56
device confirmation, 11
DIP switches, 111, 114
dispense commands, 11
dispense communications, 11
dispensing bins, 63
dispensing mechanism, 74, 81
dispensing position, 3
dispensing position number, 62
distribution CCA, 98, 107
DM, CDM, MDM
 position sensing, 98
DM, CDM, MDM
 controller, 95, 101, 107
 DIP switch banks, 96
 DIP switches, 96, 111
 distribution CCA, 98, 107
 drawer assemblies, 98
 drawer assembly, 95, 111
 drawer assembly positions, 96
 drawer configuration, 101, 108
 drawer solenoid, 101

 jumper connections, 98
 key configuration, 100
 letter designation, 95
 locking mechanism, 102, 103
 magnetic reed switches, 96, 97
 microprocessor, 96
 microprocessor address, 96
 position sensing, 95
 reed switches, 98
 security flap, 100, 109
 solenoid locking mechanism, 96
 solenoid output, 96
 Version 1.0, 95
 Version 1.5, 95
door position switch, 117, 132
drawer assemblies, 98
drawer assembly, 95
drawer assembly positions, 96
drawer configuration, 101, 108
DT

 bar code reader, 36
 card reader, 35
 computer assembly, 32, 33, 45
 ferrite core assemblies, 31
 hard drive, 27
 internal cables, 27
 internal components, 27
 keyboard, 34, 45
 LAN card, 27
 lithium battery, 36
 mag-stripe card reader, 35
 motherboard, 27, 36
 ON/OFF switch, 29
 power supply, 33, 45
 security panel, 27

E

earlier DT version, 9, 27
ELC
 controller, 113
 DIP switches, 114
 microprocessor, 113
 microprocessor address, 113
 port positions, 114
 test switches, 113
 unlocking mechanism, 113
electronic lock, 117
ELM
 door switch, 121
 locking mechanism, 121

F

ferrite core assemblies, 31
front door, 66

G

gating mechanism, 74

H

helix configurations, 64
helix dispensing motor, 81
helix dispensing shelf assembly, 81
helix motor, 82
helix motors, 64
helix retainer, 89
helix sizes, 62

I

I/O communication, 67
I/O controller, 67
IB cable, 31
IBDiag application, 2, 11
IBDiag diagnosis, 18
IBDiag scripts, 11
IB Module
 communication, 55
 IBPC controller, 55
 inventory bus (IB), 55
 power source, 4
IBPC controller, 55
 power up delay, 56
IBPC Module
 daughter board, 56
 ground loop, 56
 LED response signatures, 56
 power monitor, 56
index switch, 82, 88
injectable bin, 74
injectable dispensing bins, 79
inventory bus
 24VDC bus, 4
 RS232 bus, 4
inventory bus (IB), 55

J

jumper connections, 98
jumper socket, 84

K

key configuration, 100
key number, 72, 145
keyboard, 34, 45

L

label assignments, 62
LAN cable, 31
LAN card, 27
later DT version, 9
latest DT version, 27, 47
lithium battery, 36
lock, 66
locking mechanism, 67, 69, 102, 103, 117

M

mag-stripe card reader, 35, 42
maintenance access rights, 3
master address list, 11
MedSelect Customer Support Center, 155
microprocessor, 67, 74, 96, 113, 135, 136
microprocessor address, 67, 74, 113, 135, 136
module communication port numbers, 63
motherboard, 27, 36
motor position jumper, 85

N

network address, 7
node addresses, 12, 17

O

on-line documentation
 availability, 155
 passwords, 156
Oracle database, 4
OSHDP, 100

P

permanent divider, 65, 89
plastic length guide, 88
polyswitch, 22, 67, 74, 96
position sensor, 17
power monitor, 56, 59
privileged users, 3

R

reed switches, 98
repair/replace policy, 1
restock, 76
root password, 3

S

scanner, 123
SCM
 door position switch, 117
 electronic lock, 117
 locking mechanism, 117

- solenoid cable, 120
- security contact points, 5
- security flap, 100, 109
- server, 127
- signal names, 24
- SmartStock
 - scanner, 123
- solenoid locking mechanism, 96
- SST
 - door position switch, 132
 - microprocessor, 135, 136
 - microprocessor address, 135, 136
- SupplySource Tower, 131
- system cable runs, 24
- system cables, 10
- system device nodes, 12

T

- test inventory, 2
- test patient, 2
- test switches, 75, 113
- touchscreen, 38

U

- UDM
 - bin releasing mechanism, 77
 - cabinet cover, 72
 - cable segment, 73
 - cable slack, 67
 - cable tie locator, 69
 - coil loops, 73
 - coiled cable, 67
 - communication port number, 63
 - controller, 82
 - counterclockwise helix, 85

- dispensing bin, 63
- dispensing mechanism, 81
- dispensing position, 3
- dispensing position number, 62
- front door switch, 66
- gating mechanism, 74
- helix configurations, 64
- helix dispensing motor, 81
- helix dispensing shelf assembly, 81
- helix motor, 82
- helix motors, 64
- helix retainer, 89
- helix sizes, 62
- I/O communication, 67
- I/O controller, 66, 67, 72, 73
- IB distribution, 67
- index switch, 82, 88
- injectable bin, 74
- injectable dispensing bins, 79
- jumper socket, 84
- label assignment, 62
- locking mechanism, 67, 69
- motor position jumper, 85
- permanent divider, 65, 89
- plastic length guide, 88
- shelf number, 62
- shelves, 62
- solenoid lock, 67
- test switches, 83
- unlocking mechanism, 113
- UPS, 129
- user account, 3

V

- Virtual storage, 5

