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Owner's Guide 0300210-01 Rev. A

DTAM PLUS™
OPERATOR INTERFACE MODULE

Catalog Numbers: 2707-L40x, 2707-V40x



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Important Notes

1. Please read all the information in this owner's guide before installing the product.
2. The information in this owner's guide applies to hardware version A and firmware version 1.0 or later.
3. This guide assumes that the reader has a full working knowledge of the relevant processor.

Notice

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Using this Manual

Objectives

This chapter provides an overview of this manual. It covers:

- Chapter contents
- Intended audience
- Package contents
- Conventions
- Related publications

Chapter Contents

The manual contains the following chapters:

Chapter	Title	Purpose
Preface	Using this Manual	Provides an overview of the manual.
1	DTAM Plus Overview	Contains a description of the DTAM Plus and accessory devices.
2	Loading an Application	Describes how to apply power and transfer applications between the computer running the DPS Software and the DTAM Plus.
3	Using the Function Menu	Describes how to access and use the DTAM Plus Function menu to perform terminal operations.
4	Running Applications	Describes the basic screen types and operating procedures that are common to most applications.
5	Installation	Provides procedures for mounting the DTAM Plus. Also provided are wiring instructions and recommendations.
6	Communication Connections and Setup	Describes RS-232, RS-485 and Remote I/O connections. Setup guidelines are provided for SLC and PLC controllers.
7	Troubleshooting and Maintenance	Provides assistance in identifying and correcting common operating problems. Cleaning recommendations are also provided.
Appendix A	Specifications	Provides the specifications and agency ratings and European Union Directive Compliance.
Appendix B	DTAM Plus Cable Diagrams	Provides the cable diagrams for the DTAM Plus.
Appendix C	Special Controller Functions	Provides the special controller functions.
Appendix D	Terminal Mode	Provides the characters when the DTAM Plus is in terminal Mode.
Appendix E	DTAM Plus Mounting Template	Provides a mounting template for the DTAM Plus.

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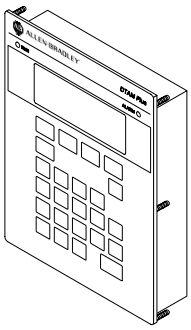
Intended Audience

No special knowledge is required to operate the DTAM Plus. If you are installing the DTAM Plus, you must be familiar with standard panel cutout and installation techniques. If wiring the DTAM Plus, you must be familiar with electrical codes in your area (see inside front cover).

You should be familiar with the DTAM Programming Software. See related publications.

Package Contents

The DTAM Plus shipping box contains:



DTAM Plus



User Manual
(Catalog No. 2707-UM001B–EN–P)



European Type GMD
Fuses and Holders



DIP Switch Cover



Mounting Nuts (8)
(2 Spare)

Conventions

This manual uses the following conventions:

- Keys that you press on the DTAM Plus are enclosed in brackets [ ]. For example: [NEXT] refers to the NEXT key on the DTAM Plus.
- References to menus are initial cap followed by the word Menu. For example: Special Menu, Main Menu, Other Menu
- All DTAM Plus displays are shown inside a rectangular box.

1 C-Port	5 Special
2 P-Port	6 Term
3 Clk/Cal	7 Test
4 Reset	8 Other

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Related Publications

You may want to refer to the following publications for additional reference.

DTAM Plus Publications

Publication Number	Title
2707-801	DTAM Programming Software Programming Manual (Series H or later Software)

Wiring Publications

1770-6.2.2	Data Highway / Data Highway Plus / Data Highway-485 Cable Installation Manual
1770-4.1	Programmable Controller Wiring and Grounding Guidelines

SLC Publications

Publication Number	Title
1747-6.21	SLC 500 Fixed Hardware Style Installation and Operation Manual
1747–UM011	SLC 500 Modular Hardware Style Installation and Operation Manual
1746–UM004	SLC 500 BASIC Module Design and Integration Manual
1746–RM001	SLC 500 BASIC Language Reference Manual
1746–PM001	SLC 500 BASIC Development Software Programming Manual
1747-6.6	Remote I/O Scanner User Manual
1747-RM001	SLC 500 Reference Manual

PLC-5 Publications

Publication Number	Title
1785-6.2.1	1785 PLC-5 Programmable Controllers Design Manual
1785-6.1	PLC-5 Instruction Set Reference
1785-6.6.1	PLC-5 Family Programmable Controllers Hardware Installation Manual
1785-7.1	PLC-5 Programmable Controllers Quick Reference

MicroLogix Publications

Publication Number	Title
1761-6.3	MicroLogix 1000 User Manual
1761-6.2.1	MicroLogix 1000 Quick Reference Guide

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Chapter 1

DTAM Plus Overview

Objectives

This chapter describes the DTAM Plus and accessories.

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General Information

The DTAM Plus interfaces with the Allen-Bradley PLC and SLC controller product lines. The DTAM Plus allows operators to monitor and manipulate process data on the plant floor.

RS-485 (DH-485), RS-232 / RS-422 (DF1) or Remote I/O Options. Connect the DTAM Plus to the SLC family of processors via DH485, in network or point-to-point modes or Remote I/O through a 1747-SN scanner. Connect to the PLC family using Remote I/O or RS-232 / RS-422 DF1 through Channel 0 of PLC-5 processors.

8K or 40K Memory Capability. Supports up to 50 or 244 screens of data.

Recipe Operations. Recipe type functions allow operators to quickly modify blocks of data. Download data to a maximum of 10 non-sequential register addresses per screen. Link multiple recipe screens to download data to more than 10 addresses.

Real Time Clock. 40K versions allow time stamping of critical reports and displayed data.

Point-Access/Display Function. Allows you to monitor or modify data files in SLC or PLC controllers. Use this function to setup and debug application programs.

ASCII Input Capability. 40K versions allow the input of ASCII data, such as decoded bar code data, through the RS-232 printer port.

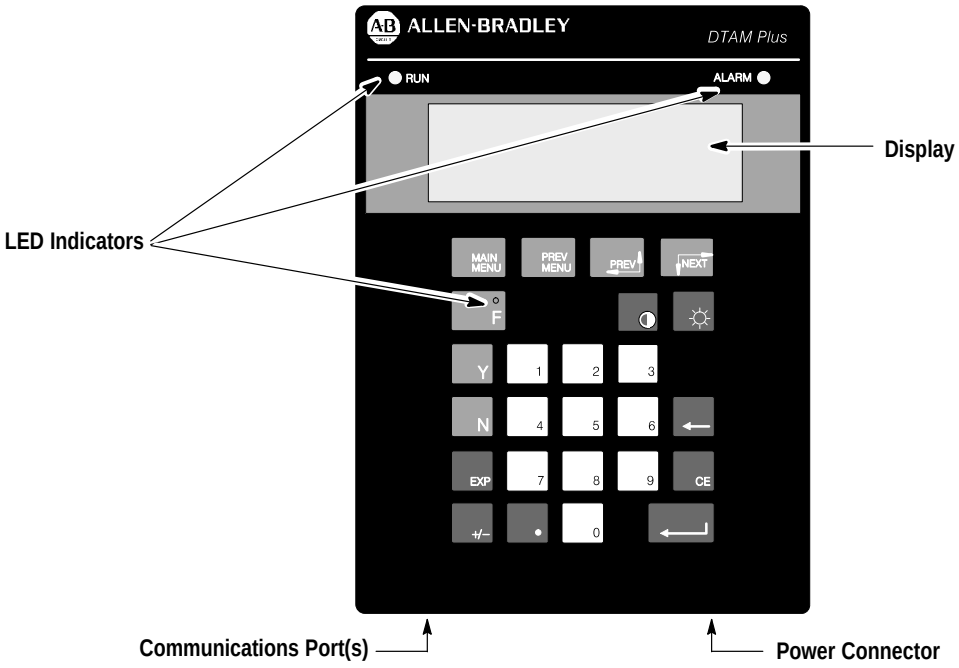
PLC or SLC Controlled Screen Changes. Controllers can both monitor and change the displayed screen.

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Description

The front panel of the DTAM Plus terminal is shown below.

Figure 1.1
DTAM Plus (front view)



Display

The 4 line by 20 character display uses either a Liquid Crystal Display (LCD) with LED backlighting or a Vacuum Fluorescent Display (VFD).

You can adjust both the contrast and backlight levels on LCD displays using the keypad. You can only adjust brightness on VFD displays.

Keypad

The keypad is a sealed unit with 25 tactile feedback keys. The VFD version does not include the half moon brightness key so has 24 keys. The keys are color coded for easy identification of key functions. The keypad is designed for hand operation. Using any other object or tool may damage the overlay or key.

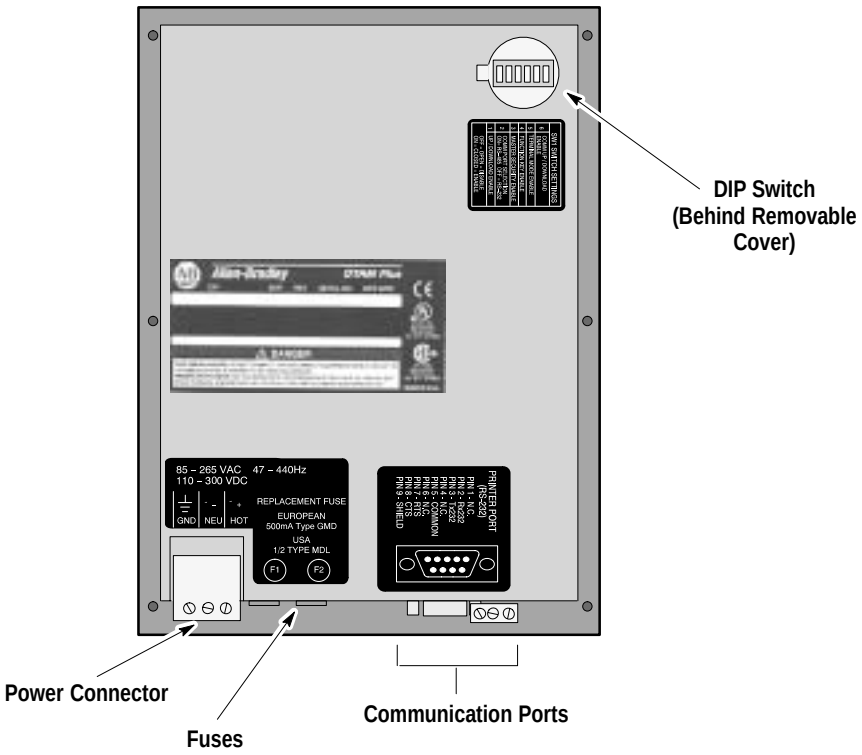
LED Indicators

The front panel of the DTAM Plus has three indicators.

LED Indicator	Color	Indication
RUN	Green	Indicates proper operation of the DTAM Plus.
ALARM	Red	Indicates an alarm condition. The LED flashes on and off until the alarm is acknowledged.
Function (F) Key	Yellow	Indicates the F (Function) key is active. **Note:** DIP Switch SW-4 enables the F key.

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Figure 1.2
DTAM Plus (back view)



Communications Port

The DTAM Plus is available with a variety of communication options as shown below.

Catalog No.	Port Type		
	RS-232/485	Printer	Remote I/O
2707-L8P1, -L8P2	X		
2707-L40P1,-L40P2, -V40P1,-V40P2,-V40P2N	X	X	
2707-L8P1R, -L8P2R,	X①		X
2707-L40P1R, -L40P2R, -V40P1R, -V40P2R, -V40P2NR		X②	X

① For transferring applications only; no host communications.
② Also use to transfer applications or upgrade firmware.

Power Connector

The power connector is a non-removable, screw terminal block. Refer to the power connector label (on back of DTAM Plus) for the proper voltage range.

DIP Switch

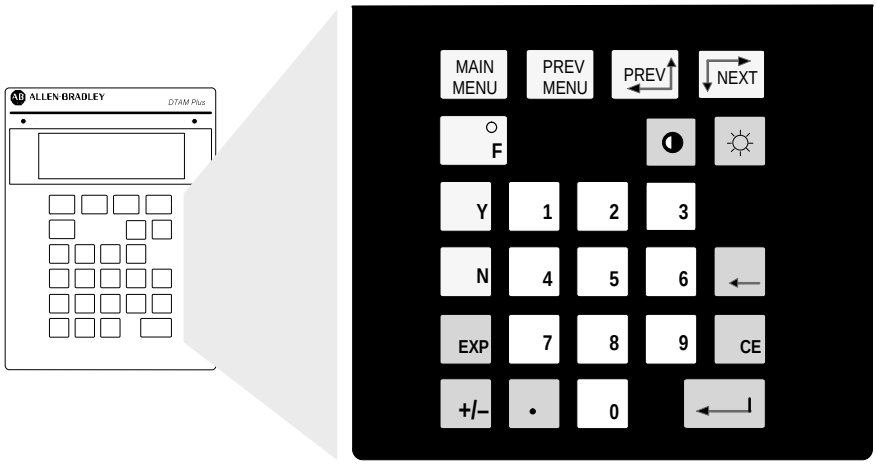
A 6-position DIP switch (under a removable cover) on the back selects operating settings. To remove cover, align cover tabs with notches in hole.

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Keypad

Figure 1.3 shows the DTAM Plus keypad.

Figure 1.3
Keypad



The keys on the DTAM Plus keypad are color coded by function. Blue keys are for navigation and operator responses; dark grey keys control display and format; and light grey keys are for numeric entry.

Table 1.A
Key Functions

Key	Function	Key	Function
MAIN MENU	Returns to the main menu of an application. If the ALARM LED is flashing, the MENU key is not functional until you press Y to acknowledge the alarm.	◑	Adjusts the contrast of the LCD display in 4 steps. **Note:** Not available on VFD displays.
PREV MENU	Steps back through menus in an application. If the ALARM LED is flashing, the PREV MENU key is not functional until you press Y to acknowledge alarm.	☼	• Adjusts the brightness (LED backlighting) of LCD displays in 4 steps. • Adjusts the character brightness on VFD displays in 2 steps.
PREV	Steps back through a sequence of linked screens.	←	Deletes the previous character.
NEXT	Steps forward through a sequence of linked screens.	EXP	• Sends the current screen to the serial printer. • Allows entry of exponential numbers. **Note:** The F key enables EXP key. See Chapter 3 for details.
○ F	Access the Function menu for performing terminal operations.	CE	Clears an entire value during data entry. You cannot clear an entry after pressing Enter, the value has been sent to controller.
Y	• Enters a Yes response. • Acknowledges an alarm. • Sets the status of a bit in a data entry screen. • Increments the Elem and SElem fields in the P–A/D.	+/–	Toggles a data entry value between positive or negative.
N	• Enters a No response. • Clears the status of a bit in a data entry screen. • Decrements the Elem and SElem fields in the P–A/D.	•	Enters a decimal point.
0 → 9	Enters a number during data entry or selects a numbered menu item.	↵	Sends the entered data or default value to the processor.

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DIP Switches

The 6 position DIP switch allows you to enable or disable certain functions. Access the DIP switch by removing the cover on the back (access cover is shipped in the hardware bag on new units).

Figure 1.4
DIP Switch

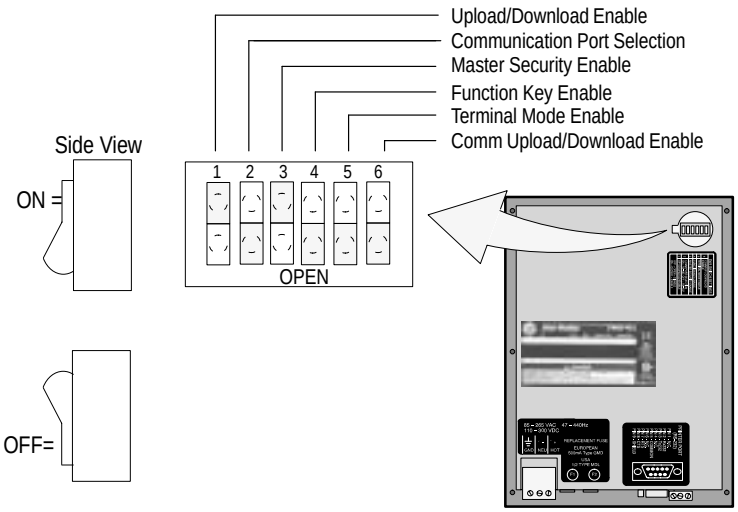


Table 1.B
DIP Switch Functions

Switch Position	Function	Setting	Function
1 See note ①	Upload/Download Enable	ON	Enables the transfer of applications between the DTAM Plus and a computer running DPS. Communication between the DTAM Plus and controller is disabled. Keypad entry is disabled.
		OFF	Enables communication between the DTAM Plus and controller. Switch must be in this position to run an application.
2 See note ②	Communication Port Selection	ON	Enables the port for RS-485 communications (DH-485, RS-422).
		OFF	Enables the port for RS-232 communications.
3 See note ②	Master Security Enable	ON	Enables the master code. Enabling the master code allows any security code to be accessed or modified.
		OFF	Disables the master code. You can still access a security screen or special functions but cannot modify security codes.
4 See note ②	Function Key Enable	ON	Enables the F (Function) key on the keypad. Operator has access to the function menu.
		OFF	Disables the F (Function) key on the keypad. Operator cannot access the function menu.
5	Terminal Mode Enable	ON	Enables the terminal mode allowing the DTAM Plus to display ASCII data received from the communications port and transmit text from any key pressed.
		OFF	Disables terminal mode.
6 See note ③	Comm Upload/Download Enable	ON	Enables uploads and downloads using the communications port (with SW1 set also, see above).
		OFF	Disables the communications port for uploads/downloads, maintaining the network connection. On 40K models, you can upload/download using the printer port. On 8K models, you can upload/download using communications port when this switch is ON or OFF.

① DTAM Plus resets each time this switch position is changed.
② The setting takes effect immediately.
③ The printer port is always enabled, this switch only enables or disables the communications port for upload/download.

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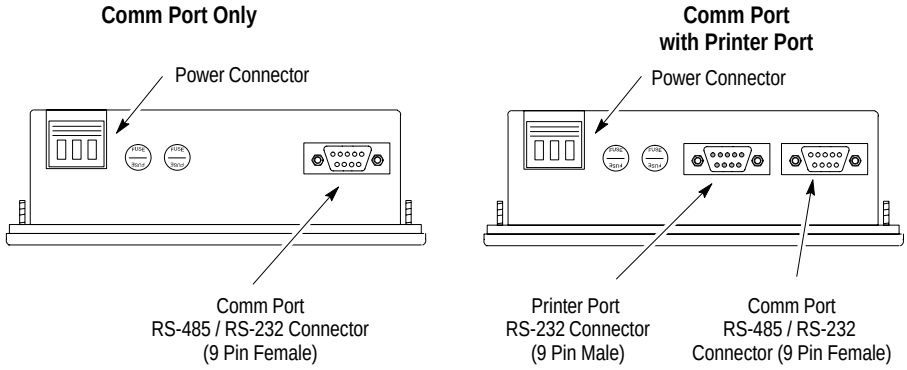
Communication Ports

Versions with Comm Port

The configurable communications port of the DTAM Plus supports RS-485 or RS-232. Use RS-485 to communicate with SLC processors over the Allen-Bradley DH485 network as:

- one of 32 nodes on a multidrop network
- direct connection to a single SLC processor or the 1746-BAS module. Communication via the 1746-BAS module provides direct backplane access and faster data throughput.

Use RS-232 to communicate point-to-point DF1 to Channel 0 of the PLC-5 processors. You can also use RS-232 to download/upload DTAM Plus application programs or to use the DTAM Plus in Terminal mode.



The DTAM Plus supports the following parameters for RS-485 and RS-232C communications:

RS-485 and RS-232 Communications Parameters	Options
Baud Rate	300, 1200, 2400, 4800, 9600, 19200, 38400
Data Bits	7 or 8
Parity	Odd, Even, None

The DTAM Plus supports RS-422 with a PLC-5 (DF1 protocol) when the Comm port is set to RS-485.

DF1 Communications Parameters	Options
Protocol	DF1 Full-Duplex
Error Detect	CRC
BAUD Rate	300, 1200, 2400, 4800, 9600, 19200 (Default-9600)
Parity	None or Even (Default = Even)
Control Line Operation	No Handshaking
Stop Bits	1

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Communication Ports

Remote I/O Versions

Remote I/O versions of the DTAM Plus support direct links to a PLC/SLC scanner or subscanner module on a remote I/O link. The DTAM Plus appears to the controller like a standard I/O rack.

Remote I/O Communications Parameters	Options
Baud Rate	57.6K, 115.2K, 230.4K
Rack Size	$^1/_4$, $^1/_2$, $^3/_4$, Full

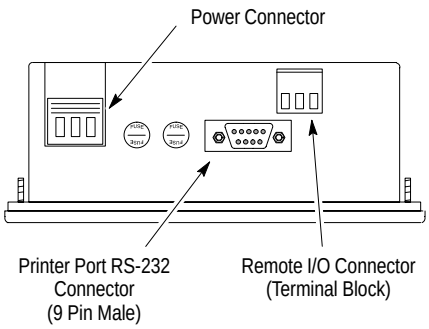
Remote I/O with Printer Port

Remote I/O versions with a printer port download/upload application files through the RS-232 printer port. The printer port is also used to upgrade the operating system firmware.

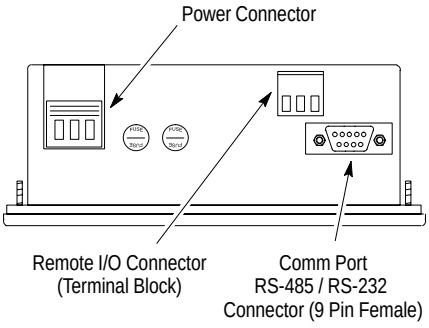
Remote I/O with Comm Port

Remote I/O versions without a printer port have a selectable RS-485 / RS-232 Comm port. This Comm port is only for transferring application and upgrading the operating system. **You cannot use this port to connect to a host controller.**

Remote I/O With Printer Port



Remote I/O With Comm Port



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RS-232 Communications

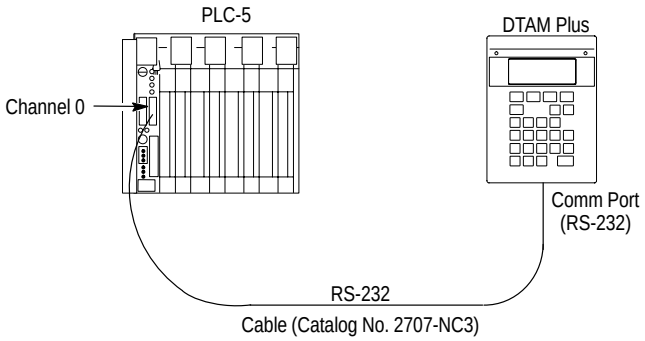
Versions with a Comm Port

The Comm port allows point-to-point communications with:

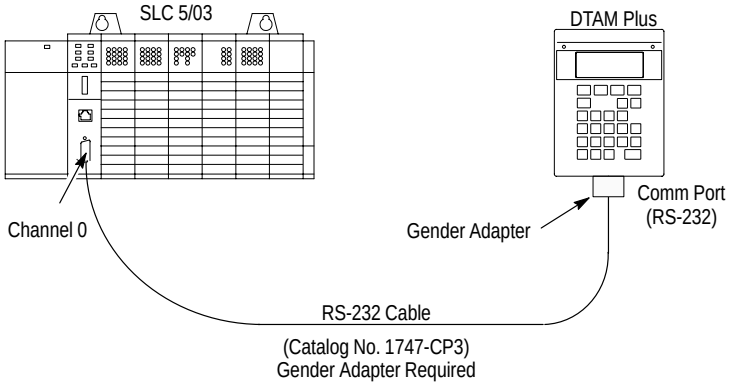
- PLC-5 Channel 0 (configured as RS-232 port, DF1 protocol)
- SLC 5/03, 5/04, 5/05, RS-232 port (DH485 protocol)

Figure 1.5
RS-232 Communications

DTAM Plus to PLC-5 Channel 0



DTAM Plus to SLC 5/03 or 5/04



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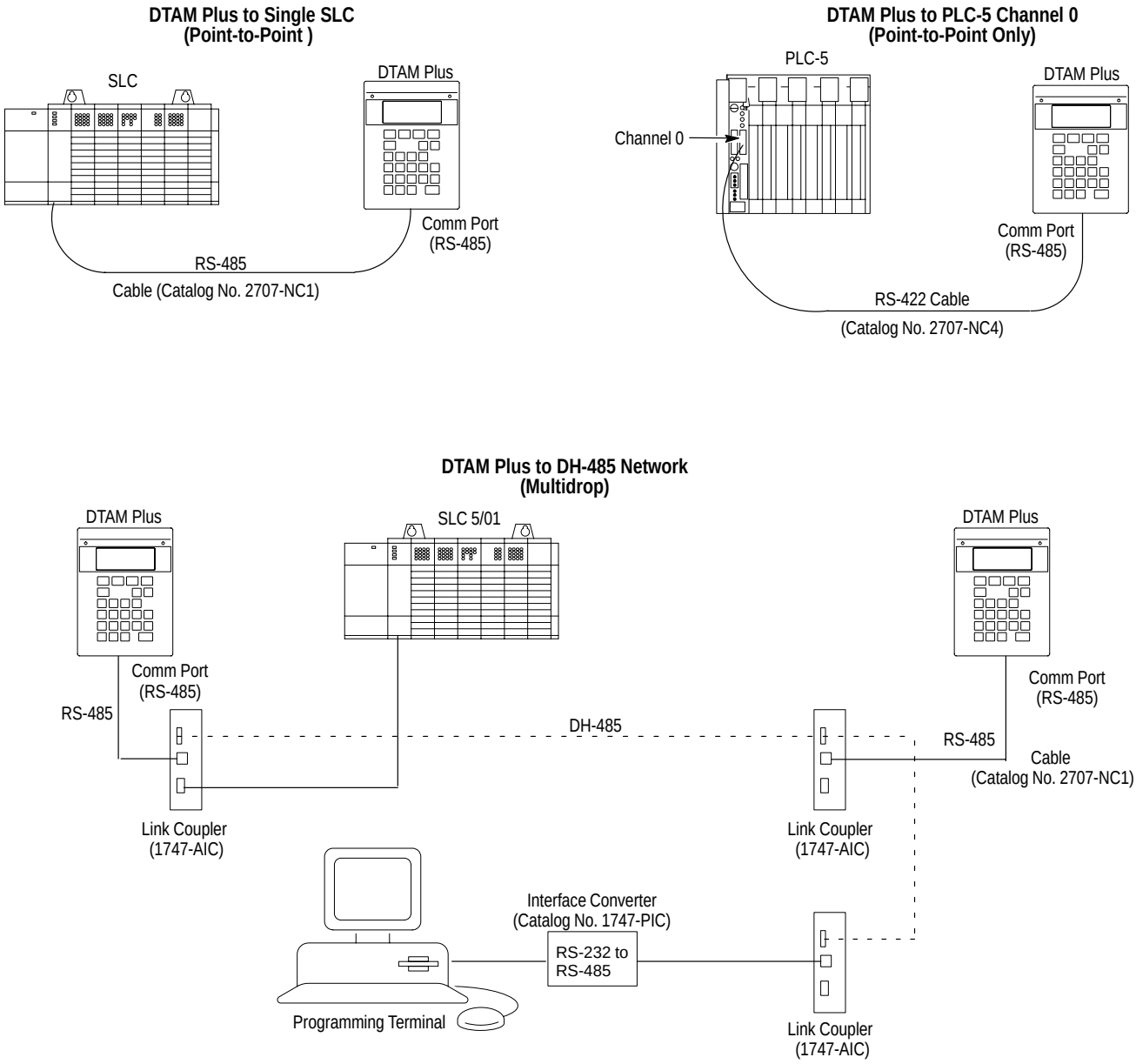
RS-485 Communications

Versions with a Comm Port

The Comm port allows:

- Point-to-point communications with a PLC-5 Channel 0 port (configured as RS-422 port, DF1 protocol)
- Point-to-point or multidrop communications with an SLC controller DH-485 port

Figure 1.6
RS-485 Communications



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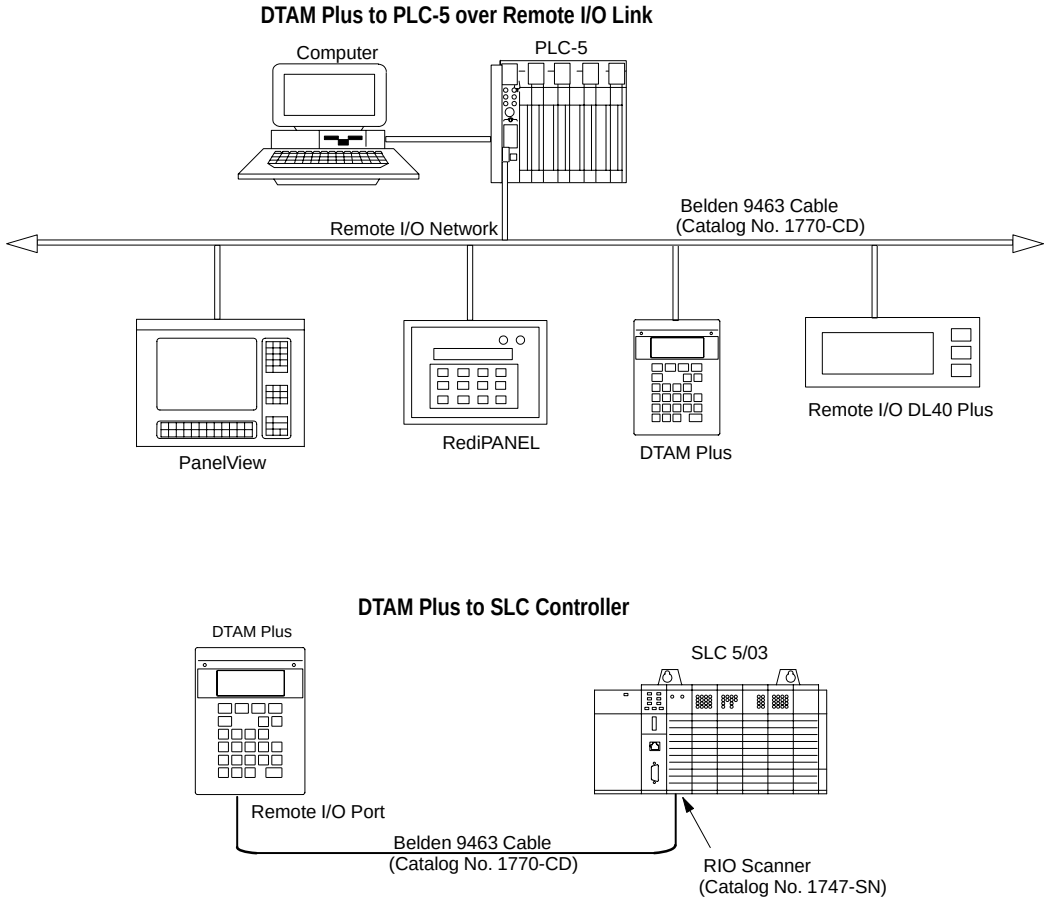
Remote I/O Communications

Remote I/O Versions

The Remote I/O port allows you to connect the DTAM Plus to:

- a PLC over a Remote I/O link
- an SLC 1747-SN Scanner
- a PLC-5 scanner or subscanner

Figure 1.7
Remote I/O Connections



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Default Settings

The DTAM Plus is preset at the factory with the following defaults:

Operating System

The DTAM Plus is provided with a default DH-485 application file. The application file displays a screen with the message:

Bul 2707 DTAM Plus
No Program Loaded

DIP Switch Settings

The DTAM Plus is shipped with the following DIP Switch settings:

DIP Switch Position	Default Setting	Function
1	ON	Upload/Download Enabled
2	ON	Communication Port Selection (RS-485)
3	ON	Master Security Enabled
4	OFF	Function Key Disabled
5	OFF	Terminal Mode Disabled
6	ON	COMM Upload/Download Enabled

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Operating Parameters

You can set the following parameters using the DTAM Plus menu functions.

Function	Parameter	Default Value		
		Comm Port RS-485	Comm Port RS-232	Remote I/O Port
Comm Port	Baud	19200	2400	2400
	Data Bits	8	8	8
	Parity	Even	None	None
Printer Port	Baud	9600	9600	9600
	Data Bits	8	8	8
	Parity	Even	Even	Even
	Handshake	Off	Off	Off
	LineFeed	Off	Off	Off
	Port Enable	On	On	On
Remote I/O Port	Baud	N/A	N/A	230.4K
	Rack Size	N/A	N/A	Full
	Last Rack	N/A	N/A	Yes
	Rack Number	N/A	N/A	2
	Module Group	N/A	N/A	0
Special	DTAM Plus Node	00	N/A	N/A
	Max. Node	02	N/A	N/A
	Controller Node	01	N/A	N/A
Other	Simulate	Off	Off	Off
	Master Code	00000000	00000000	00000000
	Scale	On	On	On

DTAM Programming Software (DPS)

DTAM Plus applications are developed off-line using a personal computer running DTAM Programming Software (DPS). DTAM Plus operating system upgrades are also transferred using a personal computer.

Use DPS software (Catalog No. 2707-NP, Series H or later) to create application screens for both the DTAM Plus, DTAM Micro and MicroView Operator Terminals. For a description of DPS, refer to the Programming Manual (Publication No. 2707-801).

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Product Options and Accessories

The tables below lists the options that are available for the DTAM Plus.

Versions with a Comm Port

Catalog Number	Description ①
2707-L8P1	LCD Display, 8K Memory, P1 Power Supply
2707-L8P2	LCD Display, 8K Memory, P2 Power Supply
2707-L40P1	LCD Display, 40K Memory, Printer Port, Real Time Clock, P1 Power Supply
2707-L40P2	LCD Display, 40K Memory, Printer Port, Real Time Clock, P2 Power Supply
2707-V40P1	VFD Display, 40K Memory, Printer Port, Real Time Clock, P1 Power Supply
2707-V40P2	VFD Display, 40K Memory, Printer Port, Real Time Clock, P2 Power Supply
2707-V40P2N	VFD Display, 40K Memory, Printer Port, Real Time Clock, P2 Power Supply NEMA Type 4X Rating (Indoor Use Only)

① See Specifications for voltage ranges of P1 and P2 Power Supplies.

Remote I/O Versions

Catalog Number	Description ①
2707-L8P1R	LCD Display, 8K Memory, P1 Power Supply②
2707-L8P2R	LCD Display, 8K Memory, P2 Power Supply②
2707-L40P1R	LCD Display, 40K Memory, Printer Port, Real Time Clock, P1 Power Supply③
2707-L40P2R	LCD Display, 40K Memory, Printer Port, Real Time Clock, P2 Power Supply③
2707-V40P1R	VFD Display, 40K Memory, Printer Port, Real Time Clock, P1 Power Supply③
2707-V40P2R	VFD Display, 40K Memory, Printer Port, Real Time Clock, P2 Power Supply③
2707-V40P2NR	VFD Display, 40K Memory, Printer Port, Real Time Clock, P2 Power Supply NEMA Type 4X Rating (Indoor Use Only)③

① See Specifications for voltage ranges of P1 and P2 Power Supplies.

② Has selectable Comm port for uploading and downloading application files or firmware upgrades.

③ Printer port is also used for uploading and downloading application files or firmware upgrades.

Accessories

Catalog Number	Description
2707-NC1	Cable, DH485 Network Interface
2707-NC2	Cable, RS-232C Program Upload/Download
2707-NC3	Cable, DF1 RS-232C Interface, 8 feet (2.43 meter)
2707-NC4	Cable, DF1 RS-422 Interface, 15 feet (4.57 meter)
2707-NC5	Cable, RS-485 Upload/Download Cable
2707-NC6	Cable, Bar Code Interface, connects to Allen-Bradley bar code scanners (Catalog No. 2755-G3-D, -G6-D, -LD1-D, -LD2-D)
2707-NC10	Cable, RS-232 Interface, 8 feet (2 meter)
2707-NP	Offline Software Development Package (Series H or later)

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Chapter 2

Loading an Application

Objectives

This chapter describes how to apply power and transfer applications between the offline programing software (DPS) and the DTAM Plus.

Section	Page
Power Source	2–1
Applying Power	2–2
Powerup Sequence	2–3
Upload/Download DIP Switch Settings	2–5
Upload/Download RS-232 Connections	2–6
Upload/Download RS-485 Connections	2–7
Computer Setup	2–7
Downloading an Application	2–8
Uploading an Application	2–13

Power Source

This section describes power connections for initial desktop setup and programming. Refer to Chapter 5 for installation wiring instructions.

The DTAM Plus is available in two voltage ranges:

- Versions with P1 power supply, accepts 15-23V AC (47 to 440 Hz) or 20-30V DC
- Series D versions with P1 power supply only, accepts 20-30V DC
- Versions with P2 power supply, accepts 85-265V AC (47 to 440 Hz) or 110-300V DC



ATTENTION: Verify that the power is disconnected from the power source before wiring. Failure to disconnect power may result in electrical shock.

Make sure that the supply voltage matches the voltage label on the back of the DTAM Plus. The incorrect voltage may damage the DTAM Plus.

Do not overtighten the power connector screw terminals. Overtightening the terminals may damage the DTAM Plus.

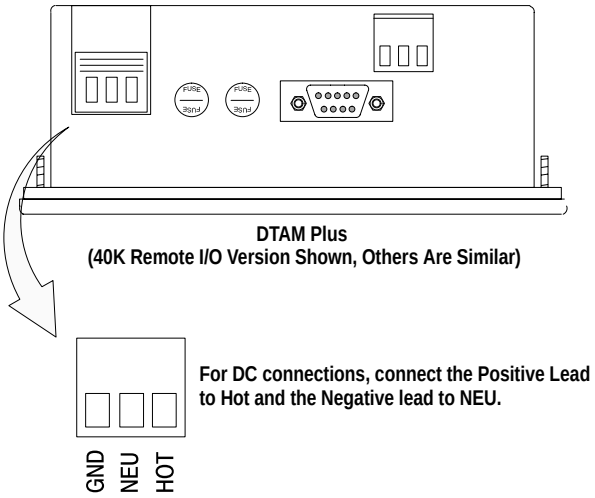
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Applying Power

To apply power to the DTAM Plus:

1. Connect the ground, neutral, and hot lines as shown below.

   Verify the connections by checking the power supply label on the back of the DTAM Plus.



2. Apply power.

   The DTAM Plus performs a powerup sequence.

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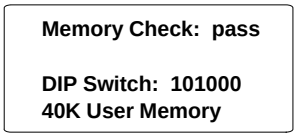
Powerup Sequence

The powerup sequence is automatic. The sequence depends upon the setting of DIP switch position SW-1 (upload / download enable). The DTAM Plus is shipped with SW-1 On.

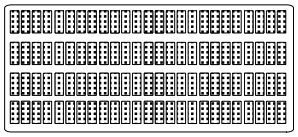
Powerup Sequence (DIP Switch SW-1 ON)

The following steps show the powerup sequence if DIP switch SW-1 is ON.

1. The DTAM Plus verifies the system memory checksum, program checksum, and system RAM. When done, the result is displayed with the current DIP switch settings.

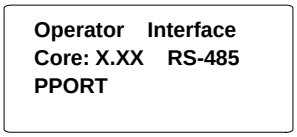


2. The display is tested, every pixel of the display is turned on.

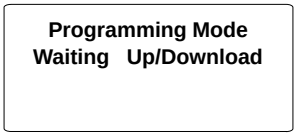


   Use this display to verify that all pixels are operational.

3. The firmware version number and type of communication port(s) is displayed (PPort, RS-232, RS-485 or Remote I/O).



4. The DTAM Plus waits for an application download.



   You cannot operate the DTAM Plus keypad while in the upload/download mode. The DTAM Plus is waiting for upload/download operations with a personal computer running the DTAM Programming Software (DPS).

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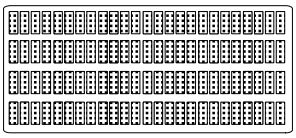
Powerup Sequence (DIP Switch SW-1 OFF)

The following steps show the powerup sequence if DIP switch SW-1 is OFF.

1. The DTAM Plus verifies the system memory checksum, program checksum, and system RAM. After the test is completed, the result is displayed with the current DIP switch settings.

```
Checksum:  passed
DIP Switch:  001000
RAM: pass
40K User Memory
```

2. The display is tested, every pixel of the display is turned on.



   Use this display to verify that all pixels are operational.

3. The operating system firmware release number and protocol is displayed (PLC5-DF1 or AB DH-485 or Remote I/O).

```
Allen-Bradley
Operator Interface
DTAM Plus (c)  1996
FRN: 01.20  AB-RIO
```

4. On 40K versions with a clock, the current time setting is displayed.

```
DATE: Wed Aug 12 98
TIME: 01:12:47

Diagnostics Complete
```

5. The first application screen displays. When the DTAM Plus is powered up for the first time you see:

```
Bul. 2707 DTAM Plus
No Program Loaded
```


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Upload / Download DIP Switch Settings

Before you can upload or download an application, you must verify that DIP switch SW-1 is ON. (DTAM Plus is shipped in this position).

To access the DIP switch, remove the cover from the access hole on the back of the DTAM Plus (align cover tabs with notches in hole to remove). The DTAM Plus is shipped without the cover installed, you can find it in the hardware bag.

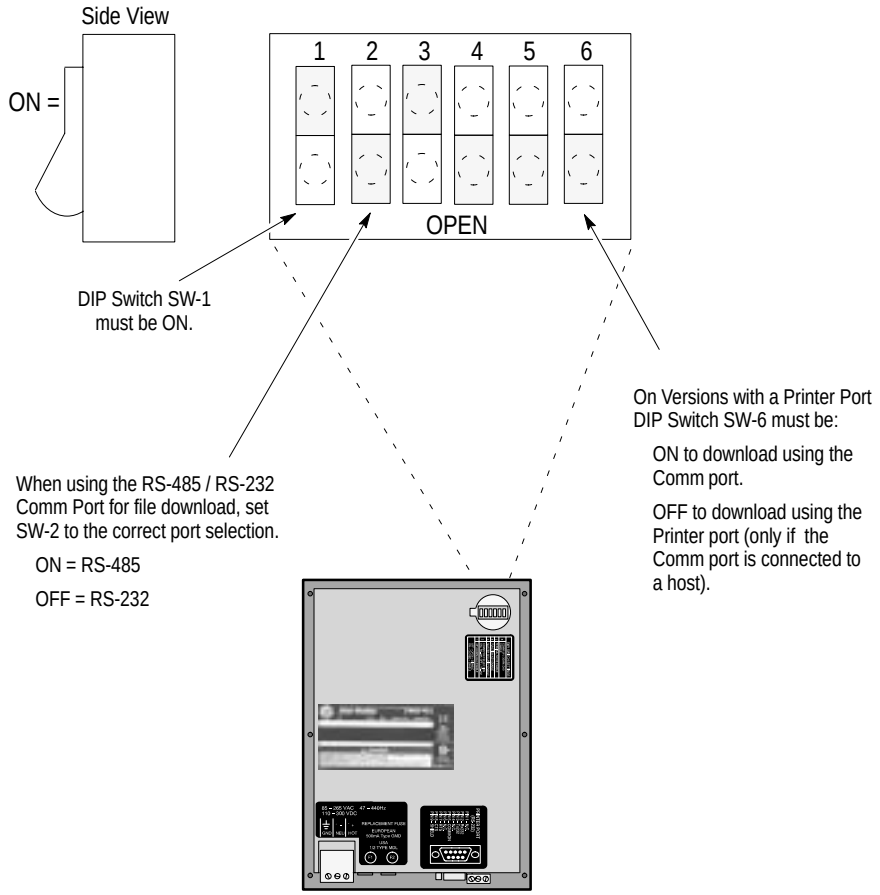
On versions with both a Comm and a Printer port, you can transfer applications using the communication port or the printer port:

- Set DIP switch position SW-6 ON to select the Comm port
- Set DIP switch position SW-6 OFF to select the Printer port

Note: Turn DIP switch SW-6 ON after downloading through the printer port. This allows communications to occur with the controller.

All other versions of the DTAM Plus use a single port to transfer applications; either the Comm port or the Printer port.

If using the Comm port, make sure DIP switch SW-2 is in the correct position (OFF = RS-232 download, ON = RS-485 download).

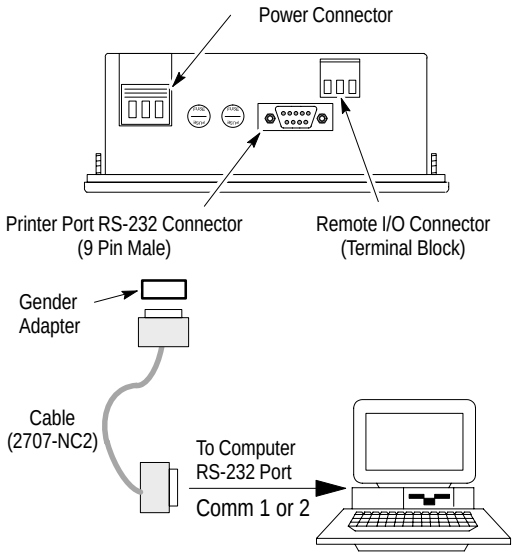


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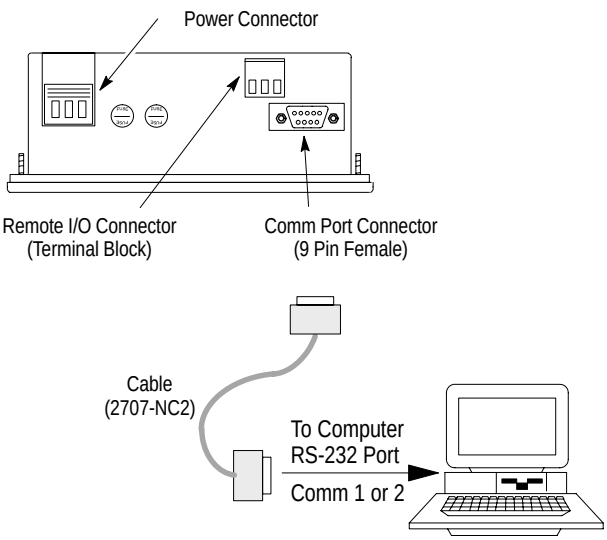
Upload / Download RS-232 Connections

To connect a DTAM Plus RS-232 port to a computer, use the RS-232 Upload/Download cable (Catalog No. 2707-NC2). Use the communications or printer port (see below). You may need a 9-to-25 pin adapter to connect the cable to your computer. A male to female gender adapter is required to connect the cable to the printer port or you can create your own cable. Appendix B provides cable diagrams.

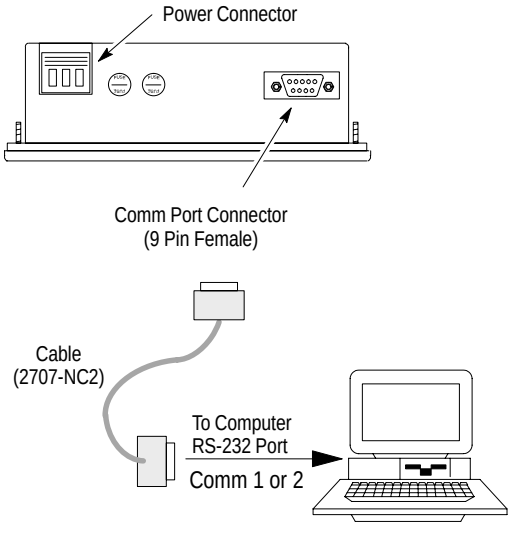
Remote I/O Version With Printer Port



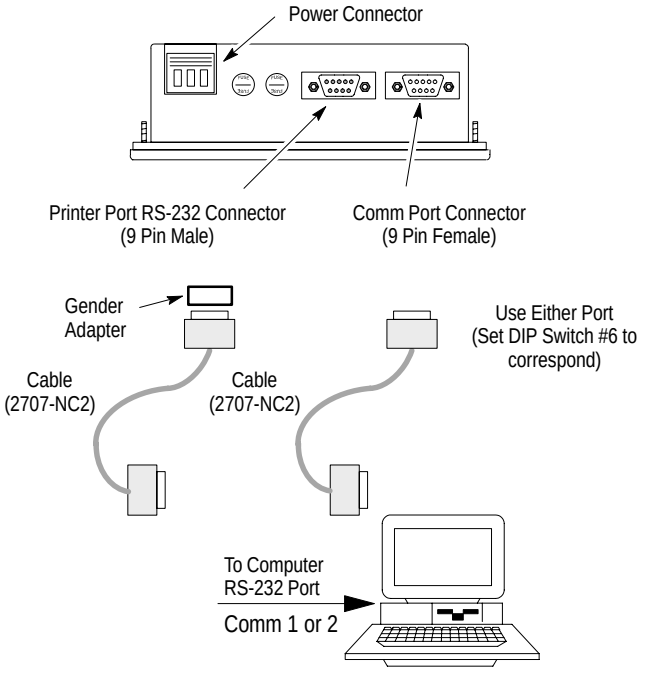
Remote I/O Version With Comm Port



Versions with a Comm Port Only



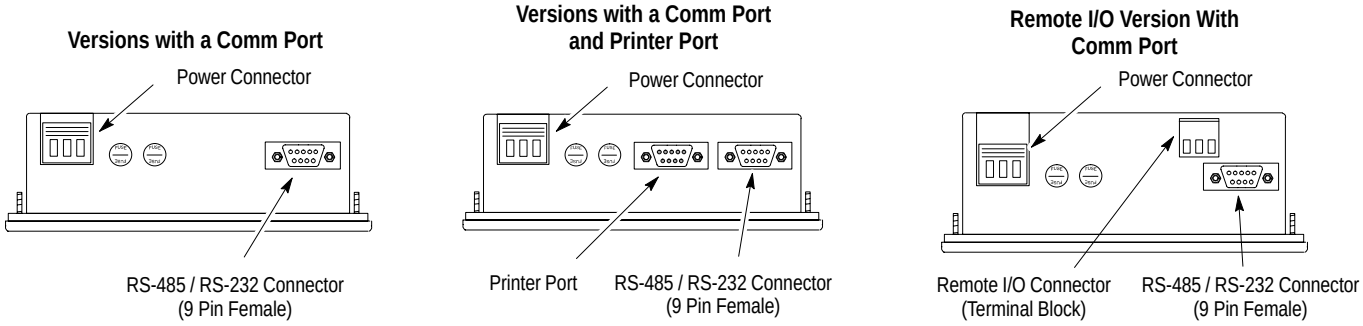
Versions with a Comm Port and Printer Port

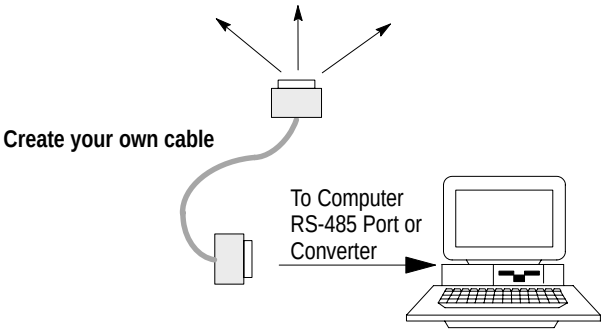


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Upload / Download RS-485 Connections

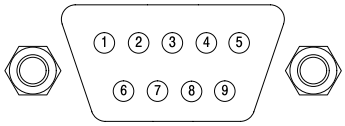
It's recommended that you use the RS-232 port for transferring applications. On DTAM Plus versions with a Comm (RS-485 / RS-232) port, you can also download applications using an RS-485 connection.





To download through the RS-485 port, you must:

- set DIP switch position SW-2 ON
- create a communication cable. The RS-485 port connections are:



Pin 1 = TX485 -
Pin 2 = Tx485 +
Pin 3 = Rx485 -
Pin 4 = Rx485 +

Computer Setup

Upload/download functions are initiated from a personal computer running the programming software DPS (Catalog No. 2707-NP, series H or later). Transfer functions always occur at 9600 Baud (regardless of the DTAM Plus application's printer or communications port settings).

After a reset with a valid application, the DTAM Plus baud rate is set to the parameters defined by the application program residing in the DTAM Plus.

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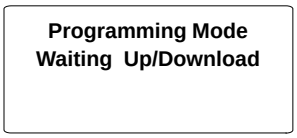
Downloading an Application

This section shows how to download an application from a computer running DPS software to the DTAM Plus. Refer to the DPS Programming Manual (Publication No. 2707-801) for additional information.

To download an application:

1. Apply power to the DTAM Plus.

   The following message appears.

   If you do not see this message, check the DIP switch settings. DIP Switch SW-1 must be ON.

2. On your computer, move to the /DPS subdirectory.

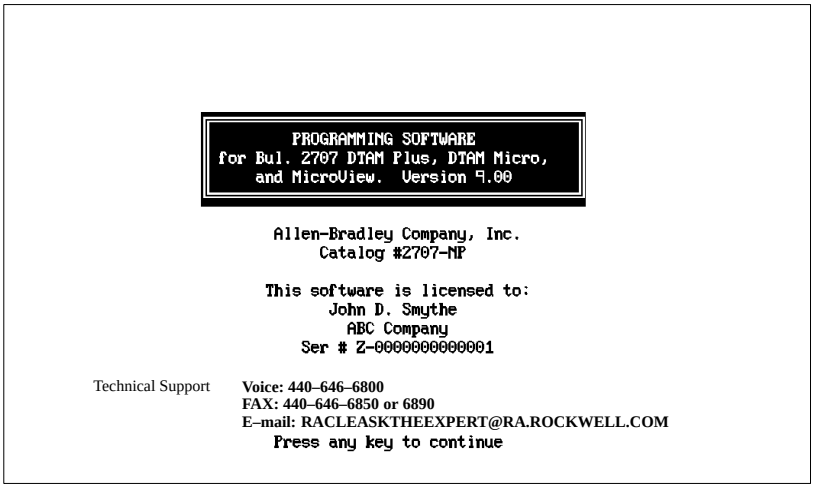
   C:\DPS>

3. Type **dps** and press [Return] to start the program.

   C:\DPS>**dps** [Return]

☞ *You will not see this prompt if a monitor was specified during DPS installation.*

4. Specify whether you are using a color monitor. Enter **Y** or **N**.
5. The startup screen displays:

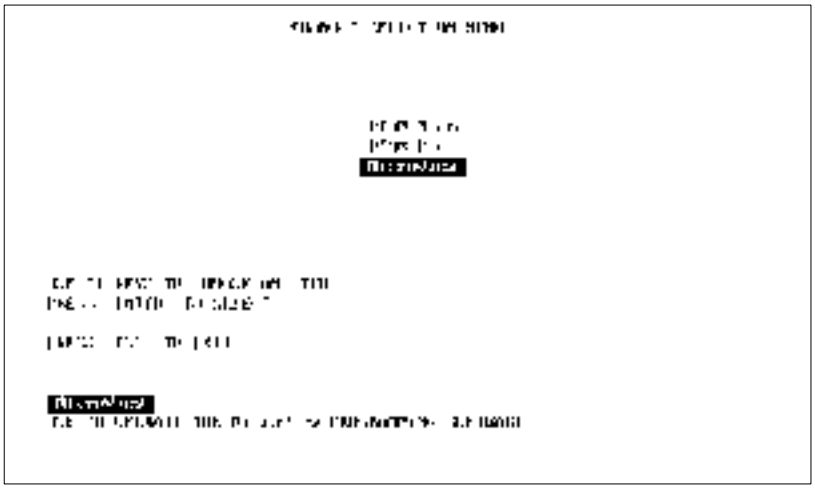


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6. Press any key (other than [Esc]) to continue.

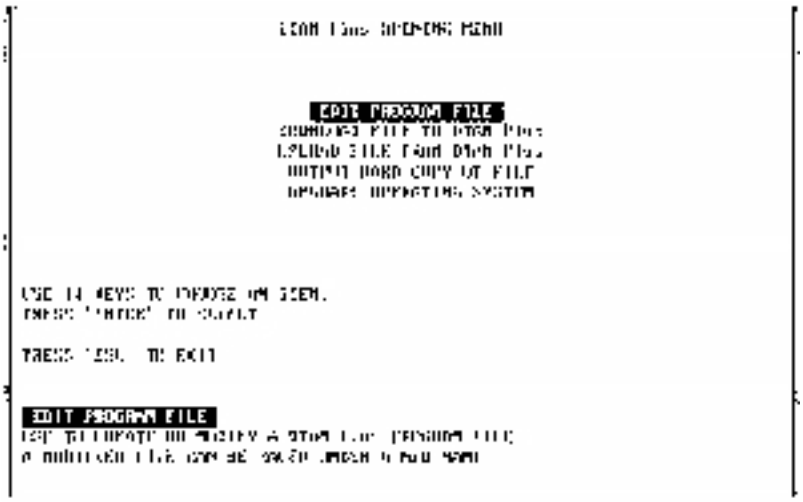
   The Product Selection Menu appears.

☞ *You will not see this prompt if a product type was specified during installation.*



7. Press the down arrow [↓] and [Return] to select the DTAM Plus product.

   The Opening Menu appears.



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Downloading an Application

8. Highlight Download File to DTAM Plus and press [Return].

   The Communication Port Selection screen appears.

☞ *You will not see this screen if a communication port was specified during DPS installation.*

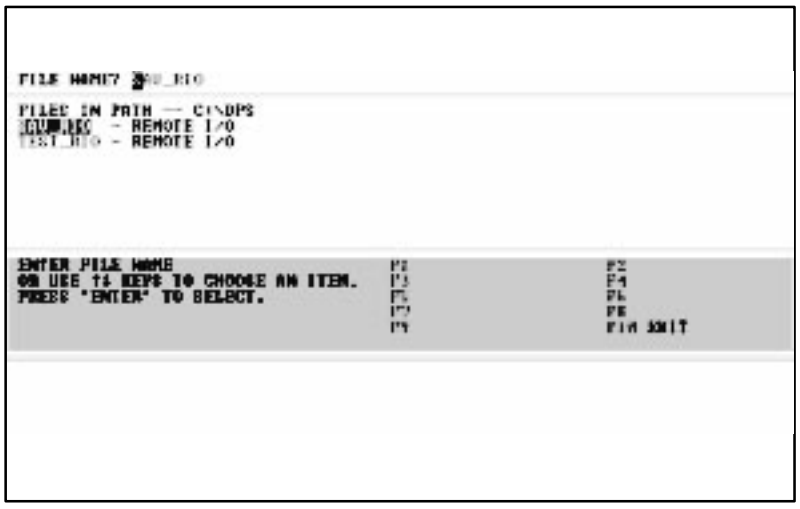


9. Highlight the serial port on your computer that is connected to the DTAM Plus (COMM 1 or COMM 2) and press [Return].

☞ *If a communication link does not occur in 10 seconds, you get an error message. Check DTAM Plus DIP switch settings and cable connections.*

10. When communication is established, this screen appears:

☞ *If a RAM memory error occurs, make sure enough computer base RAM is available. If other programs such as windows are running, reboot your computer to exit to DOS.*

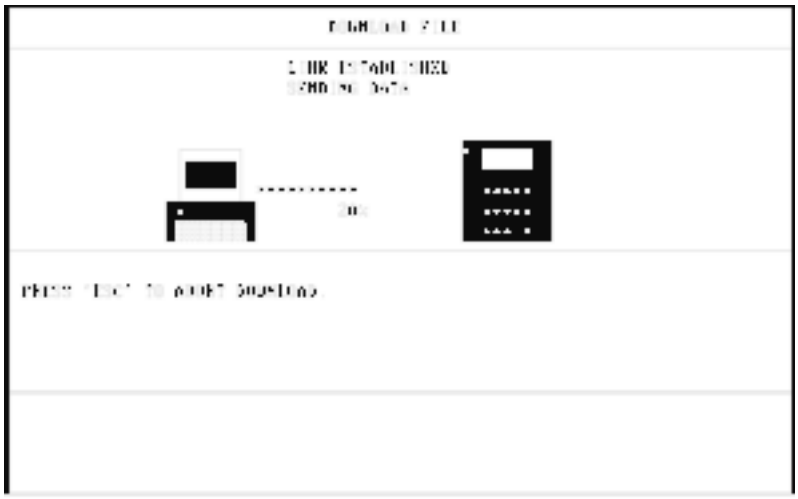


11. Enter or select the file you want to download. If the application file type (DH-485, PLC5 DF1, or Remote I/O) is different from the existing DTAM Plus operating system, you are prompted to download the new operating system.

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12. Select a file and press [Return] to load the application file.

    The download begins and the following screen shows the progress of the download operation.



13. During the download, the DTAM Plus alternately displays:

Programming Mode
Transfer in Progress
Please Wait

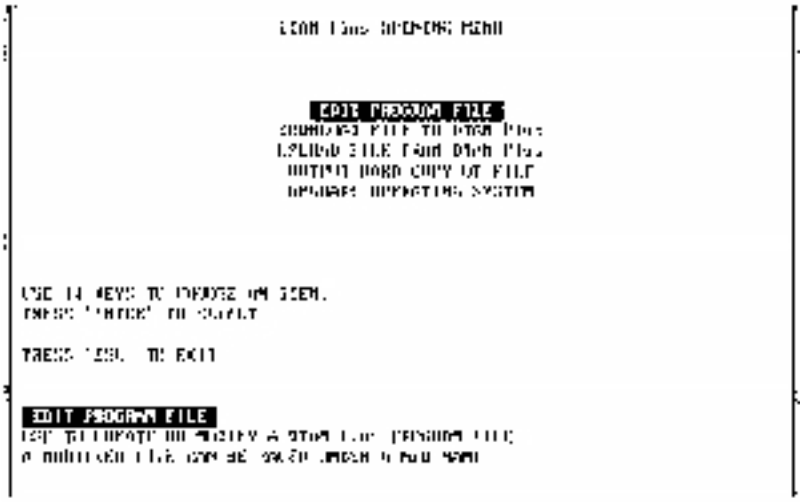
Programming Mode
Copying to Memory

and then

Programming Mode
Memory Store Done

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14. When the download is complete, you return to the Opening Menu.



and the DTAM Plus displays:

Programming Mode
Waiting Up/Download

15. Press [Esc] to exit the software.
16. Press [Y] to return to DOS.

The application is now loaded in the DTAM Plus. You can test the application using the simulate function described in Chapter 4 or you can run the application as described in Chapter 5.

Important: To run the application, set DIP switch SW-1 OFF. The DTAM Plus will reset and start the application.

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Uploading an Application

This section shows how to upload an application from the DTAM Plus to a computer running DPS software (Catalog No. 2707-NP). Refer to the DPS User manual (Publication No. 2707-801) for additional instructions.

To upload an application:

1. Apply power to the DTAM Plus.

   The following message appears.

   Programming Mode
   Waiting Up/Download

   If you do not see this message, check the DIP switch settings. DIP Switch SW-1 must be ON.

2. On your computer, move to the /DPS subdirectory.

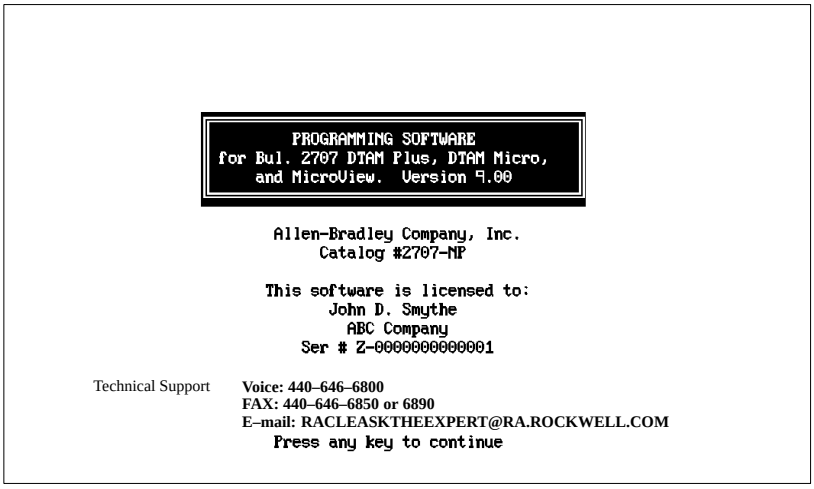
   C:\DPS>

3. Type **dps** and press [Return] to start the program.

   C:\DPS>**dps** [Return]

☞ *You will not see this prompt if a monitor was specified during DPS installation.*

4. Specify whether you are using a color monitor. Enter **Y** or **N**.
5. The startup screen displays.

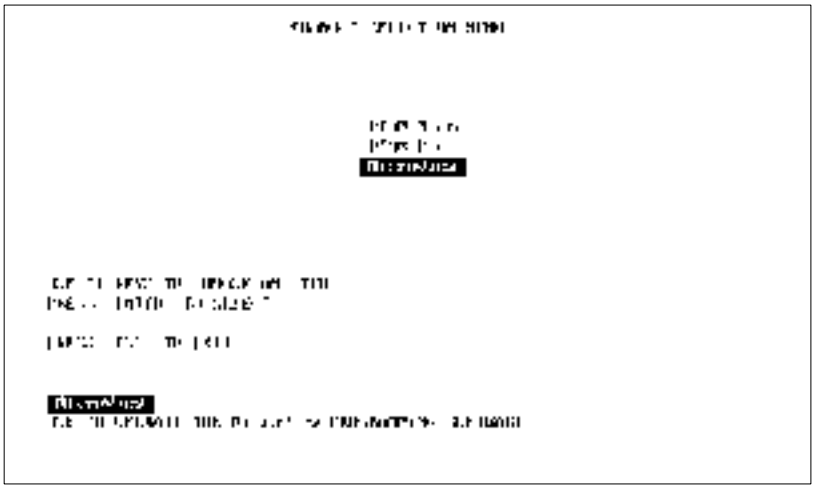


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6. Press any key (other than [Esc]) to continue.

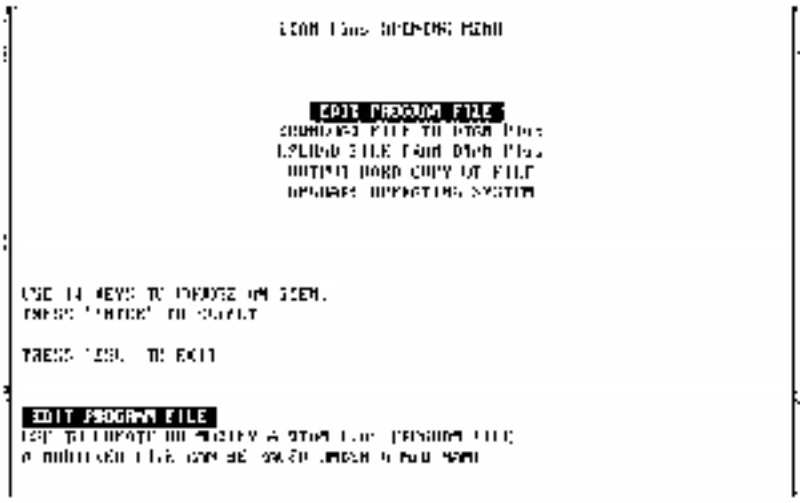
   The Product Selection Menu appears.

☞ *You will not see this prompt if a product type was specified during installation.*



7. Press the down arrow [↓] and [Return] to select the DTAM Plus product.

   The Opening Menu appears.



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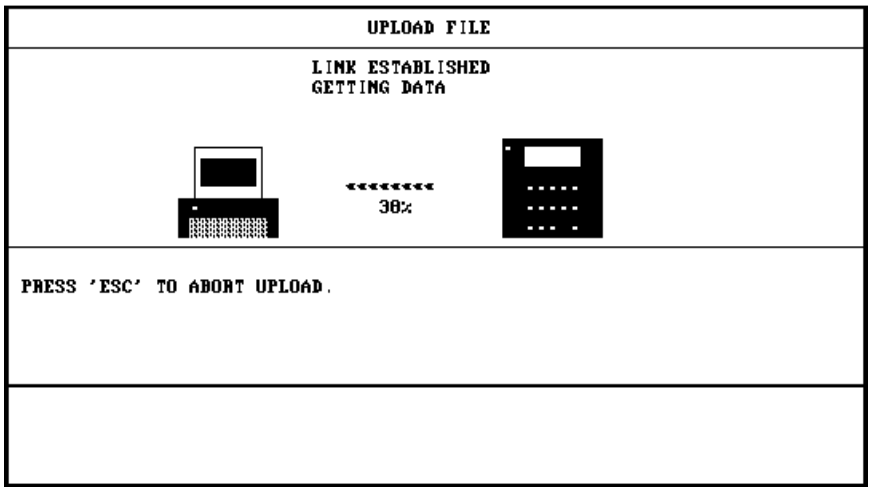
8. Highlight Upload File from DTAM Plus and press [Return].

   The Communication Port Selection screen appears.

☞ *You will not see this screen if a communication port was specified during DPS installation.*



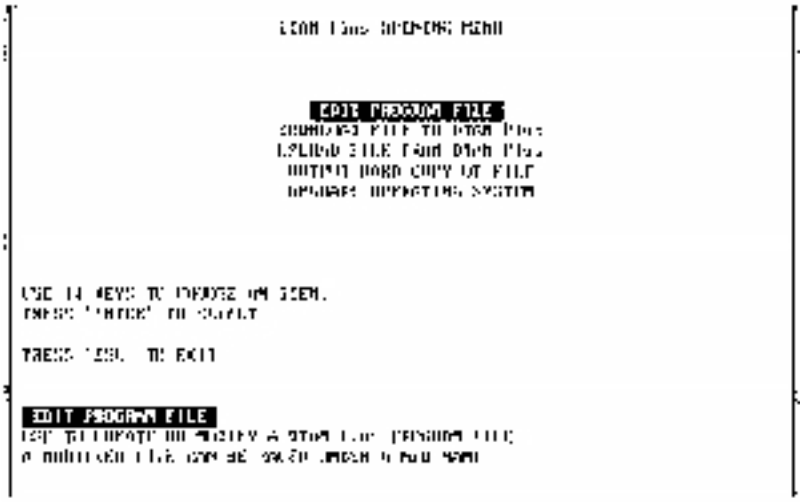
9. Highlight the serial port on your computer that is connected to the DTAM Plus (COMM 1 or COMM 2) and press [Return].
10. The upload begins and the following screen shows the progress of the upload operation.



11. You are prompted for the application file name. Enter the file name and press [Return].

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12. When the upload is complete, you return to the Opening Menu.



13. Press [Esc] to exit the software.
14. Press [Y] to return to DOS.

    The application is now loaded into the DPS software. You can edit the application as described in the DPS Programming Manual (Publication No. 2707-801).

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Chapter 3

Using the Function Menu

Objectives

This chapter describes how to perform operations from the Function menu and contains the following sections:

Section	Page
Function Key Menu	3–2
Resetting the DTAM Plus	3–3
Setting Communication Port Parameters	3–4
Displaying Remote I/O Port Parameters	3–5
Setting Printer Port Parameters	3–7
Enabling Screen Prints	3–9
Setting the Clock Calendar	3–10
Adjusting the Display Contrast	3–11
Adjusting the Display Brightness	3–12
Enabling Simulate Mode	3–13
Enabling Terminal Mode	3–14
Entering a New Master Security Code	3–16
Using Scaling	3–18
Accessing the Point /Access Display Function	3–19
Accessing Test Functions	3–20

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Function Key Menu

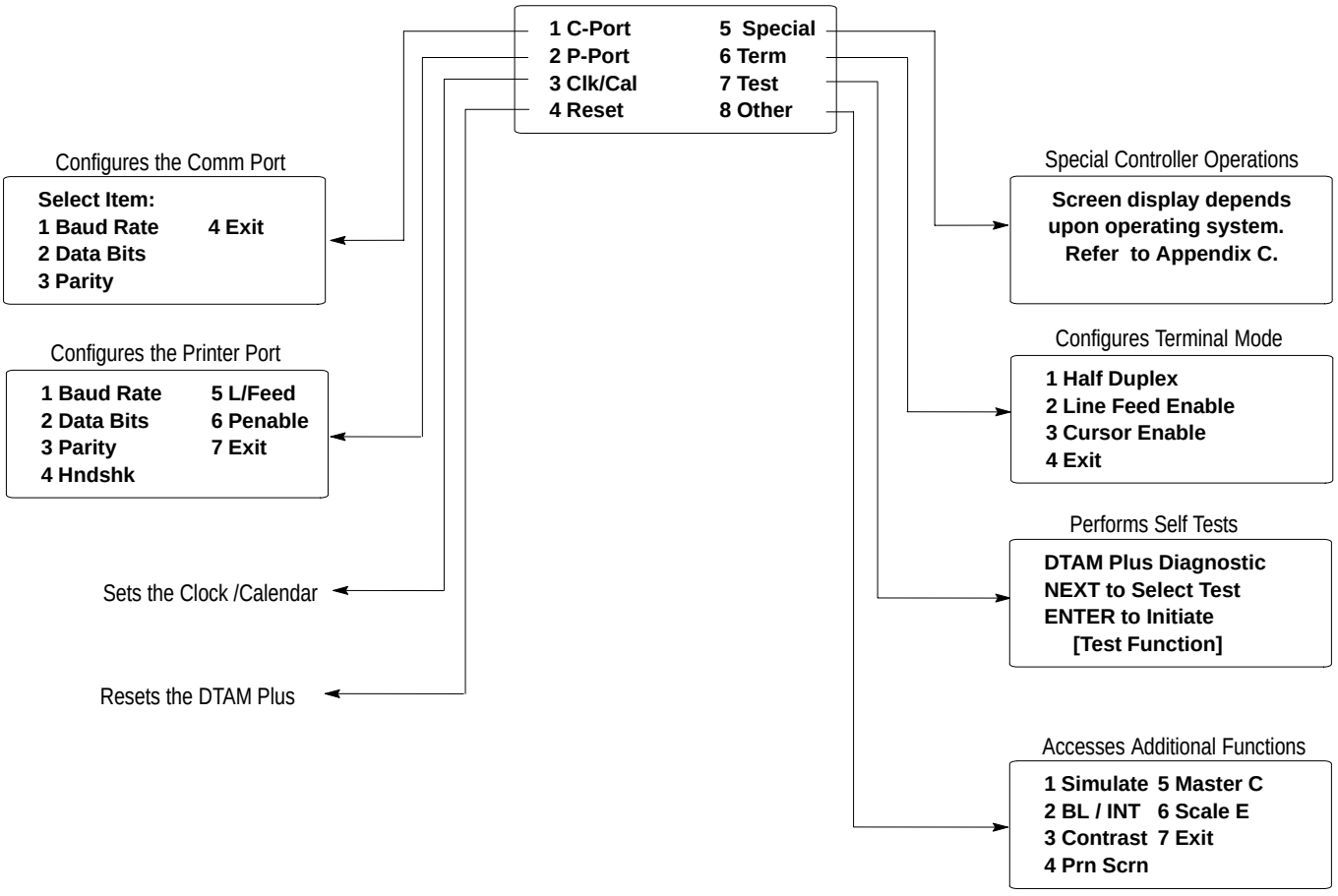
Many DTAM Plus functions are accessed from the Function menu. To access the Function menu, press the [F] key on the keypad. All other functions are halted when the menu is displayed.

Note: To enable the F (Function) key, DIP switch SW-4 must be set ON.

The Function menu provides access to these functions:

1 C-Port	**5 Special**
2 P-Port	**6 Term**
3 Clk/Cal	**7 Test**
4 Reset	**8 Other**

Select a menu item by pressing the corresponding numeric key [1] → [8]. The menu structure is shown below:



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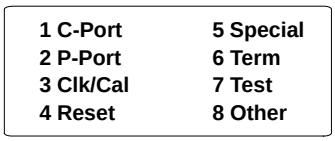
Resetting the DTAM Plus

Use the Reset function to reset the DTAM Plus after DIP switch changes or a configuration change using the Function Key Menu.

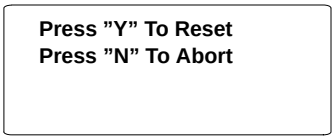
You can also use the Reset function to activate Terminal Mode if DIP switch SW-5 is set ON.

To reset the DTAM Plus:

1. From the Function Menu, select Reset [4].



   This screen appears:



2. Press [Y] on the keypad to initiate the reset.

   The DTAM Plus resets. This has the same effect as turning the power off and on. The DTAM Plus performs the self diagnostic tests and powerup displays as described in the previous section.

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Setting Communication Port Parameters

The C-Port option on the Function Menu lets you manually adjust the communication port parameters. Normally these parameters are set from the DPS programming software when an application is downloaded.

Select C-Port [1] from the Function Menu.

```
1 C-Port        5 Special
2 P-Port        6 Term
3 Clk/Cal       7 Test
4 Reset         8 Other
```

This menu displays:

```
Select Item:
1 Baud Rate     4 Exit  <-- Exits to Function Menu
2 Data Bits
3 Parity
```

Select an item by pressing the corresponding numeric key [1] → [4].

Baud Rate

Selecting Baud Rate [1] displays the current baud rate.

```
Select Baud Rate:
Baud Rate       2400
"NEXT" To Change
"ENTER" To Select
```

Press [NEXT] to toggle through the options: 300, 1200, 2400, 4800, 9600, 19200, 38400. Press [↵] to select a new rate. DH-485 communications with an SLC or network cannot be set to 300 Baud.

Data Bits

Selecting Data Bits [2] displays the current setting.

```
Select Bit Counts:
Bits            8
"NEXT" To Change
"ENTER" To Select
```

Press [NEXT] to change between 7 or 8 bits. Press [↵] to select a setting.

Parity

Selecting Parity [3] displays the current setting.

```
Select Parity:
Parity          None
"NEXT" To Change
"ENTER" To Select
```

Press [NEXT] to change between Even, Odd, or No parity. Press [↵] to select a new parity.

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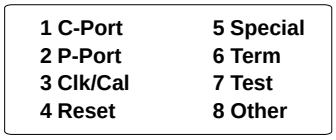
Displaying Remote I/O Port Parameters

The R–Port option allows you to **display (not modify)** Remote I/O parameters for the DTAM Plus. These parameters are set from the programming software when an application is downloaded.

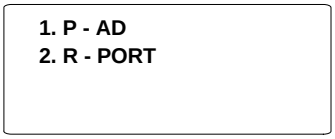
The R–Port option is only available for versions with a Remote I/O port.

To display Remote I/O communication parameters:

1. Select Special [5] from the Function Menu.



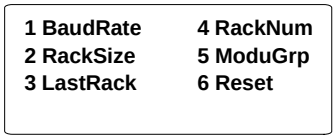
   This menu displays:



   Note: P–AD functions are described in Appendix C

2. Select R–Port [2] from the menu.

   This menu displays:

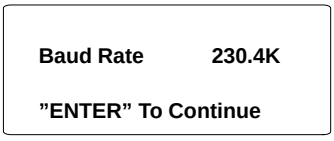


   Select an item by pressing the corresponding numeric key [1] → [6].

   The current setting for the selected parameter is displayed. Press [◄┘] to return to the previous menu.

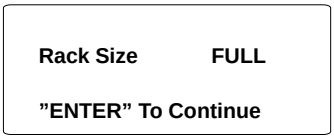
Baud Rate

Selecting BaudRate [1] displays the current baud rate.



Rack Size

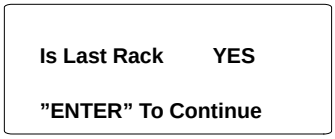
Selecting RackSize [2] displays the current rack size.



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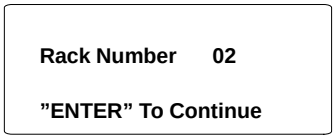
Last Rack

Selecting LastRack [3] shows whether the DTAM Plus is configured as the last rack.



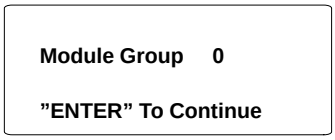
Rack Number

Selecting RackNum [4] displays the current rack number of the DTAM Plus.



Module Group

Selecting ModuGrp [5] displays the starting module group of the DTAM Plus.



Reset

Selecting Reset [6] restarts the DTAM Plus (same as cycling power).

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Setting Printer Port Parameters

The P-Port option on the Function Menu lets you manually set the RS-232 printer port parameters. Normally these parameters are set automatically from the DPS programming software when an application is downloaded.

This menu options is only valid for versions that have a printer port.

Select P-Port [2] from the Function Menu.

```
1 C-Port      5 Special
2 P-Port      6 Term
3 Clk/Cal     7 Test
4 Reset       8 Other
```

This menu displays:

```
1 Baud Rate   5 L/Feed
2 Data Bits   6 Penable
3 Parity      7 Exit
4 Hndshk
```

Baud Rate

Selecting Baud Rate [1] displays the current baud rate.

```
Select Baud Rate:
Baud Rate        9600
"NEXT" To Change
"ENTER" To Select
```

Press [NEXT] to toggle through the options: 300, 1200, 2400, 4800, 9600, 19200, 38400. Press [↵] to select a new rate.

Data Bits

Selecting Data Bits [2] displays the current setting.

```
Select Bit Counts:
Bits             8
"NEXT" To Change
"ENTER" To Select
```

Press [NEXT] to change between 7 or 8 bits. Press [↵] to select a setting.

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Parity

Selecting Parity [3] displays the current setting.

```
Select Parity:
Parity          None
"NEXT" To Change
"ENTER" To Select
```

Press [NEXT] to change between Even, Odd, or No parity. Press [↵] to select a new parity.

Handshake

Selecting Hndshk [4] enables/disables handshaking. Handshaking is a request to send a communications signal (RTS) and notification that a transmission may be sent (CTS).

```
HNDSHK Enable OFF (0)
"1" or "Y" = ON
"0" or "N" = OFF
ENTER = NC
```

Press [1] or [Y] to enable handshaking. Press [0] or [N] to disable handshaking. Press [↵] to return to P-Port menu without any change.

Line Feed

Selecting L/Feed [5] enables/disables Line Feed. When enabled, The DTAM Plus sends a line feed (LF), in addition to a carriage return after a form has been printed. When disabled, only a carriage return is sent.

```
L/Feed Enable OFF (0)
"1" or "Y" = ON
"0" or "N" = OFF
ENTER = NC
```

Press [1] or [Y] to enable a line feed. Press [0] or [N] to disable a line feed. Press [Enter] to return to P-Port menu without any change.

Port Enable

Selecting PEnable [6] enables/disables the printer port. You must enable the printer port, to upload or download applications through the port.

```
PEnable ON (1)
"1" or "Y" = ON
"0" or "N" = OFF
ENTER = NC
```

Press [1] or [Y] to enable the printer port. Press [0] or [N] to disable the printer port. Press [↵] to return to P-Port menu without any change.

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Enabling Screen Prints

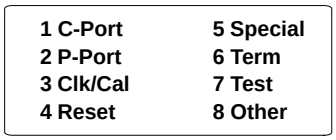
The Prn Scrn option allows you to send the current display screen to the printer port when the [EXP] key is pressed on the keypad.

When the Prn Scrn option is disabled, you can only use the [EXP] key to enter floating point data.

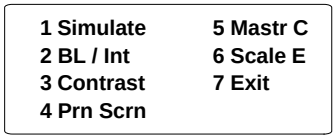
This menu options is only valid for versions that have a printer port.

To enable printing of screens:

1. Select Other [5] from the Function menu.

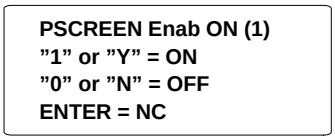


   This menu displays:



2. Press [4] to select Prn Scrn.

   The following screen appears.



3. Press [1] to enable the screen prints or [0] to disable.
4. Press [7] to exit and return to the Function Menu.

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Setting the Clock/Calendar

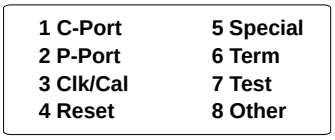
The Clk/Cal option on the Function Menu lets you set and display the internal real time clock of the DTAM Plus (only on versions with clock option).

The real time clock provides time and date information for DTAM Plus operations. You can also insert the time and date in operator screens and print forms. Refer to your controller documentation for more details on time synchronization.

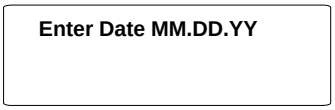
The real time clock is accurate to +/– 1 minute per month @25° C.

To set the real time clock:

1. Select Clk/Cal [3] from the Function menu.

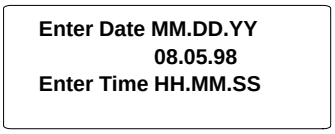


   This screen displays:



2. Enter a new date in the form MM.DD.YY with decimal points between the MM, DD and YY. Press [◄┘] to store the values in the DTAM Plus.

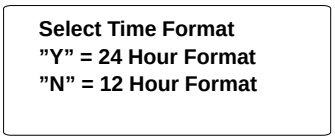
   The screen prompts you to enter a time.



HH = Hour (0-23 or –12)
MM = Minutes (0-59)
SS = Seconds (0-59)

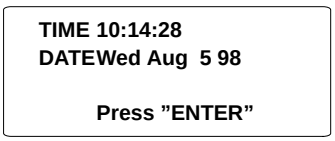
3. Enter a new time in the form HH.MM.SS with decimal points between the HH, MM and SS and then press [◄┘].

   The screen prompts you to select a 24 hour or 12 hour format.



4. Press [Y] to select 24 hour format or [N] to select 12 hour (AM/PM) format. If you press [N], you are prompted to select AM or PM.

   The screen displays both the current time and date.



5. Press [◄┘] to return to the Function menu.

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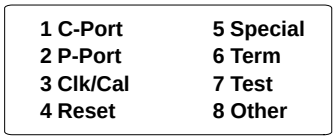
Adjusting the Display Contrast (LCD versions only)

The Contrast option on the Other menu enables or disables the contrast adjustment the of the LCD display from the contrast key. Any adjustments to the contrast from the keypad are maintained after power is cycled to the DTAM Plus. If disabled, the contrast and backlight intensity remain at their current setting and cannot be changed from the keypad.

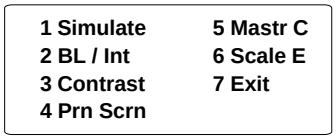
The Contrast option is only available on DTAM Plus versions with a Liquid Crystal Display (LCD).

To enable contrast adjustments from the keypad:

1. Select Other [8] from the Function menu.

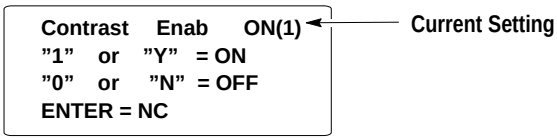


   This menu displays:



2. Press [3] to select Contrast.

   The following screen appears.



3. Press [1] to control the contrast from the keypad or [0] to disable.

   The Other menu displays.

4. Press [7] to return to the Function Menu.

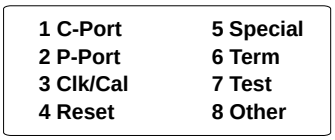
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Adjusting the Display Brightness

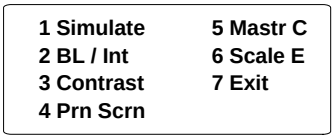
The BL / INT option on the Other menu enables or disables the backlighting (LCD versions) or character intensity (VFD versions) adjustment from the keypad. Any adjustments to the brightness from the keypad are maintained after power is cycled to the DTAM Plus. If disabled, the brightness remains at its current setting and cannot be changed from the keypad.

To enable brightness adjustments from the keypad:

1. Select Other [8] from the Function menu.

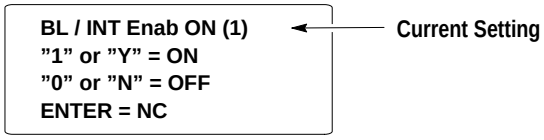


   This menu displays:



2. Press [2] to select BL / INT.

   The following screen appears.



3. Press [1] to control brightness from the keypad or [0] to disable.
4. Press [7] to exit and return to the Function Menu.

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Enabling Simulate Mode

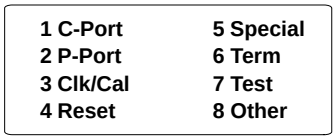
Use the Simulate mode to check an application without having a controller connected. All data normally sent by the controller, such as data for a display, is set to 0. Simulate mode:

- halts communication between the DTAM Plus and the controller.
- simulates communication with a controller.

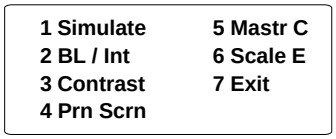
Disabling the Simulate mode resumes normal DTAM Plus operation.

To simulate an application:

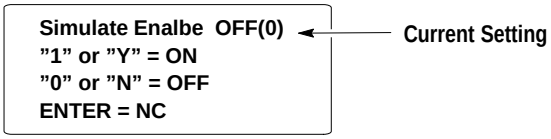
1. Download the application from the DPS software.
2. From the Function Menu, select Other [8].



   The Other Menu appears:



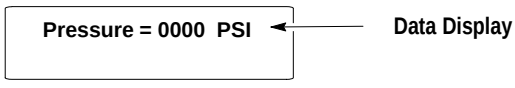
3. Press [1] to select Simulate.



4. Press [1] to enable the Simulate mode or [0] to disable.
5. Press [7] to exit and return to the Function Menu.
6. Press [4] to reset the DTAM Plus.

   The DTAM Plus displays a series of diagnostic tests, enters run mode, and then displays the Function Menu of the application.

7. Run the program as you normally would. Notice that all display registers show data as a set of zeroes.



8. After verifying the operation of the program, press the [F] key.
   All other functions are halted and the Function Menu is displayed.
9. Disable Simulate mode.

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Enabling Terminal Mode

The Term option on the Function Menu lets you set communication and display parameters for using the DTAM Plus in terminal mode.

Terminal Mode disables execution of the application program and enables the DTAM Plus to function as a terminal device.

In Terminal mode, the DTAM Plus displays any ASCII data received through the communications port. The ASCII codes associated with the keys on the DTAM Plus keypad are transmitted through the communications port when a key is pressed.

To activate terminal mode, you must set DIP switch SW1-5 to ON and reset the device. The display is cleared and ready to display received data.

To set parameters for Terminal Mode:

Select Term [6] from the Function Menu.

```
1 C-Port      5 Special
2 P-Port      6 Term
3 Clk/Cal     7 Test
4 Reset       8 Other
```

This menu displays:

```
1 Half Duplex
2 Line Feed Enable
3 Cursor Enable
4 Exit          <-- Exits to Function Menu
```

Half Duplex

Selecting Half Duplex [1] enables/disables half duplex communications to and from the device. Enabling half duplex echoes to the display all the DTAM Plus keys pressed.

```
Half Duplex      ON (1)
"1" or "Y" = ON
"0" or "N" = OFF
ENTER = NC
```

Press [1] or [Y] to enable half duplex. Press [0] or [N] to disable half duplex. Press [←┘] to return to P-Port menu without any change.

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Line Feed Enable

Selecting L/Feed [2] enables/disables Line Feed. When enabled, The DTAM Plus sends a line feed (LF) and carriage return (CR) each time a carriage return is received. When disabled, only a carriage return is sent.

```
L/Feed Enable OFF (0)
"1" or "Y" = ON
"0" or "N" = OFF
ENTER = NC
```

Press [1] or [Y] to enable a line feed. Press [0] or [N] to disable a line feed. Press [↵] to return to P-Port menu without any change.

Cursor Enable

Selecting Cursor Enable [3] enables/disables a block cursor display. When enabled, The DTAM Plus uses a block cursor display.

```
Cursor Enable ON (1)
"1" or "Y" = ON
"0" or "N" = OFF
ENTER = NC
```

Press [1] or [Y] to enable a block cursor display. Press [0] or [N] to disable a the block cursor. Press [↵] to return to P-Port menu without any change.

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Entering a New Master Security Code

The Special [5] menu item on the function menu may be password protected to restrict access to the P-A/D feature. When an application has a security screen, the operator will be prompted for a security code. The master security code provides access to the Special menu and all other security codes allowing them to be modified. Two master security codes perform special functions:

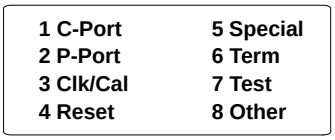
00000000 allows the operator to modify the existing master code without entering the current code.

99999999 does not allow operator to modify security codes. The master security code must be changed using the DPS software.

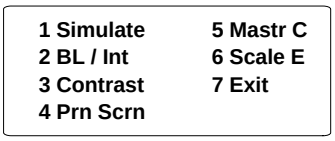
Note: DIP Switch SW-3 must be ON to access the master code function.

To enter a new Master Security code:

1. From the Function Menu, select Other [8].

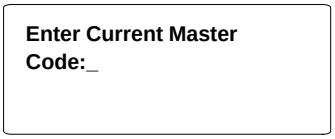


   The Other Menu appears:



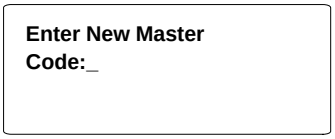
2. Press [5] to select the Master security code function.

   The master code entry screen displays:



3. Enter the current code and press [↵].

   You are prompted to enter a new code.



4. Enter a new code.

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Note: Security codes can contain the wildcard character "**?**". Any entered value will be seen as a match to the wildcard. The master security code must be different from security codes using wildcard entries. Otherwise the master security code may be seen as a security code. For example:

Security Code =12??????
Master Code = 12368794

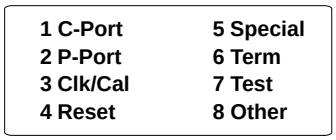
When the master security code above is entered, the DTAM Plus interprets it as a security code.

5. Press [◄┘] to return to the Other menu.
6. Press [7] to return to the Function menu.

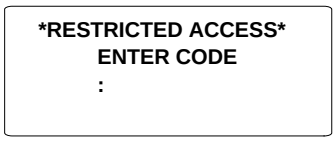
Master Security code operation:

Assuming that a security screen has been defined for the application.

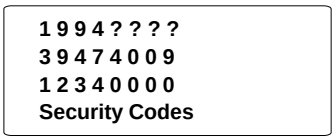
1. From the Function Menu, select Special [5].



You are prompted :



2. If you enter a valid security code, the Special menu is displayed. If you enter the master security code, you are shown the current special security codes:



You can modify any of the security codes.

3. Press the Enter key.

Access to the Special menu is provided:

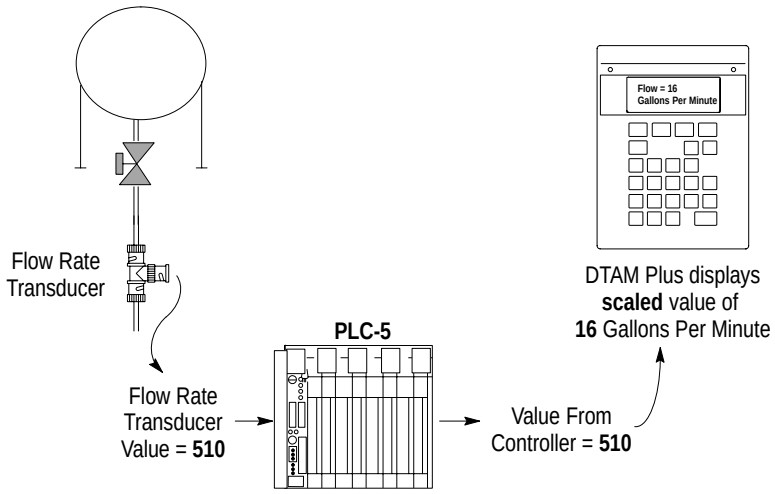


The Special menu is then displayed.

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Using Scaling

Use scaling to convert data from a controller to engineering units such as gallons or psi. When scaling is disabled, the values are not converted. Refer to the DTAM Programming Software Manual for a description of how values are scaled. The scaling factor is determined by the application designer, it cannot be changed by the operator.



To enable or disable scaling:

1. From the Function Menu, select Other.

1 C-Port	**5 Special**
2 P-Port	**6 Term**
3 Clk/Cal	**7 Test**
4 Reset	**8 Other**

   The Other Menu appears:

1 Simulate	**5 Mastr C**
2 BL / Int	**6 Scale E**
3 Contrast	**7 Exit**
4 Prn Scrn	

2. Press [6] to select Scale Enable.

   The scale enable screen appears:

Scale Enalbe ON(0) ← **Current Setting**
"1" or "Y" = ON
"0" or "N" = OFF
ENTER = NC

3. Press [1] on the keypad to enable scaling or [0] to disable scaling.

   You return to the Other Menu.

4. Press [7] to exit to the Function Menu.

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Accessing the Point/Access Display Function

The Point - Access / Display function allows you to display and modify controller data files. The P-A/D function does not allow you to write controller Input and Output files.

Appendix C provides a listing of the applicable file types for SLC and PLC-5 controllers, along with step-by-step instructions on how to use the P-A/D function.

To access the Point - Access/Display Function:

1. From the Function Menu, select Special [5].

```
1 C-Port      5 Special
2 P-Port      6 Term
3 Clk/Cal     7 Test
4 Reset       8 Other
```

This menu displays:

Remote I/O Operating System

```
1. P – A/D
2. R – PORT
```

DH485 Operating System

```
SLC 50X Network Addr
Press
"Y' to Edit Address
"N" to Bypass
```

```
DTAMPlus:00   Max:02
SLC Expected At    01
Input NewSLC Node01*
    Press ENTER
```

```
1. P – A/D
2. SLC 50X Mode
3. Memory Transfer
4. Clear SLC Fault
```

PLC5 DF1 Operating System

```
1. P – A/D
2. PLC Mode
3. Memory Transfer
4. Clear PLC Fault
```

* Only applies to the P-A/D function.

2. Select the P-A/D [1] option.
3. See Appendix C for details on how to use the P-A/D function.

Note: When an application is created (using DPS programming software), a special security screen can be configured that restricts access to the Special Menu.

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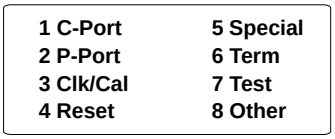
Accessing Test Functions

Use the Test menu to perform variety of tests that check the status of the DTAM Plus functions and hardware. You can access all of the Test options from the Function menu.

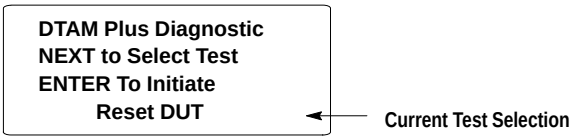
This section shows how to access the test functions. For details on how to perform each test, see Chapter 7 Troubleshooting and Maintenance.

To access the Test functions:

From the Function Menu, select Test [7].



The test screen appears:



The last line displays the current text selection. Press [NEXT] to toggle through all the options. Press [↵] to initiate the selected test.

You can run the following tests from the Test menu.

- Reset DUT (DTAM Under Test)
- DIP switch positions
- Display
- Keyboard
- Communications port
- Printer Port
- Display Control
- Random Access Memory (RAM)
- System Memory
- Program File
- Clock/Calendar
- Transmit Enable and Alarm

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Chapter 4

Running Applications

Chapter Objectives

This chapter describes screen types and operating procedures that are common to most applications. It contains the following sections:

Section	Page
DIP Switch Setting	4–1
Application Documentation	4–1
Screen Types	4–2
Screen Navigation	4–2
Menu and Sub-Menu Screens	4–3
Security Screens	4–3
Data Display Screens	4–4
Bar Graph Screens	4–4
Data Entry Screens	4–4
ASCII Input	4–5
Recipe Screens	4–6
Alarm Screens	4–6

DIP Switch Setting

Before an application can be run, verify that the DIP switch SW-1 is OFF. This enables the run mode. Refer to the DIP switch description on page 1–5.

Application Documentation

It is the responsibility of the application designer to document the operation of an application program. This chapter only provides basic guidelines. Before running an application, you should understand what processes are being controlled and monitored.

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Screen Types

Application screens can have a variety of appearances. The DTAM Plus can display seven types of screens.

- Menu and Sub-Menu Screens
- Security Screens
- Data Display Screens
- Data Entry Screens
- Recipe Screens
- Bargraph Screens
- Alarm Screens

Screen Navigation

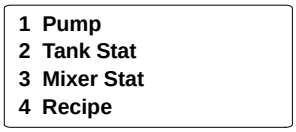
The DTAM Plus provides several options for changing the screen displays:

- Screen links
- Advisor option

Screen Links

Use the [NEXT] and [PREV] keys to step backward and forward through this sequence.

Main Menu and Sub-Menu screens list screens that can be accessed by pressing the assigned numeric key [1] through [8]. A typical Main Menu screen provides links to individual screens or sub-menus:



In the example above, pressing [2] at the Main Menu displays the status of a holding tank. Pressing [4] displays a Sub-Menu of the recipe screen options.

Advisor Option

Applications can allow screen changes that are controlled by an SLC or PLC logic controller. When the logic controller writes a valid screen number to a specified Advisor register, the corresponding screen is displayed. The controller can initiate a screen change based upon a variety of inputs to the controller. For example, a pressure limit switch can be used to initiate the display of a pressure control screen. It is the responsibility of the application designer to document when and what screen changes may occur.

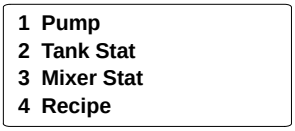
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Menu and Sub-Menu Screens

Menus and Sub-Menus provide a convenient method of accessing a large number of display screens.

Main Menu

Every application has a Main Menu screen. The Main Menu is the first application screen displayed after an initial power-up or reset.



The Main Menu provides access to the next level of screens and Sub-Menus. To access the Main Menu, press the [MAIN MENU] key. Pressing this key at any time displays the Main Menu. The only time the Main Menu will not be displayed is when an alarm screen has been triggered but not acknowledged. You must acknowledge alarm screens, by pressing [Y], before another screen can be displayed.

Sub-Menus

Sub-Menu screens function like the Main Menu. The only difference is that you must navigate through the other screens to access the Sub-Menus.

Security Screens

Security screens limit access to parts of an application. Although the text on a security screen may be changed by the application designer, many applications will use the default text:



A security code is a series of 1 to 8 digits. Each security screen can have up to 3 code entries. Entering any one of the codes provides access.

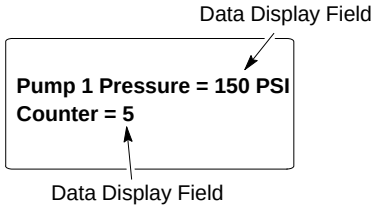
To enter a security code, use the numeric keypad. An asterisk (*) is displayed for each number entered. Press [↵] after the entire code is entered.

If a valid security code has been entered, the next linked screen is displayed. If an invalid security code is entered, an error message appears. Once the error condition is acknowledged by pressing [Y], you can re-enter the code or return to the Main Menu.

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Data Display Screens

Data display screens show either the actual or scaled value of a logic controller data address.



Data displays are updated at different intervals depending upon the application and the size of the network.

Bar Graph Screens

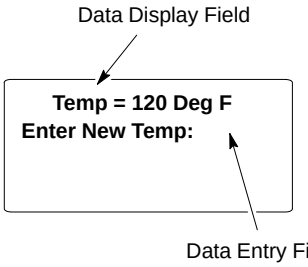
Bar graph displays provide a graphical representation of an actual or scaled value at a logic controller data address.



Bar graph displays may also contain a data display field showing the actual numeric value.

Data Entry Screens

Data entry screens contain an entry field. The length and format of the data entry field is selected by the application designer. In addition, the application designer can place a data display field on the same screen:



The data entry field must always appear last on the screen. The application designer cannot place text after a data entry field.

To enter data, use the numeric keypad. To modify an entry, press the clear entry key [CE] and re-enter the value. Press the [+/–] key to toggle between positive and negative values. Press [↵] after the entire value is entered.

Data entry screens can have a default value appear in the data entry field. A flashing cursor identifies the first digit of the default value. Pressing [↵] writes the default to the controller or you can enter a different value by pressing the [CE] key.

If a data display is included on a data entry screen, the data display value is only updated when the screen is entered. Data does not update continuously.

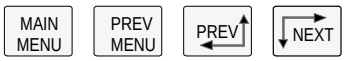
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ASCII Input

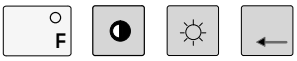
The DTAM Plus allows ASCII data to be directly entered from a device such as a bar code scanner. An ASCII entry screen looks like a standard data entry display. When the ASCII input screen is displayed, data can then be entered through the ASCII device connected to the printer port using the 2707-NC6 cable.

Here are some items you should note when using a bar code scanner as an input device for data entry fields.

- Odd character counts from the scanner are rounded up to create even byte counts. This facilitates word writes to the controller. If rounded up, the last character written will be a Null.
- When displaying an ASCII data entry screen, the following DTAM keys are active:

  and the following keys are inactive:

  and the 

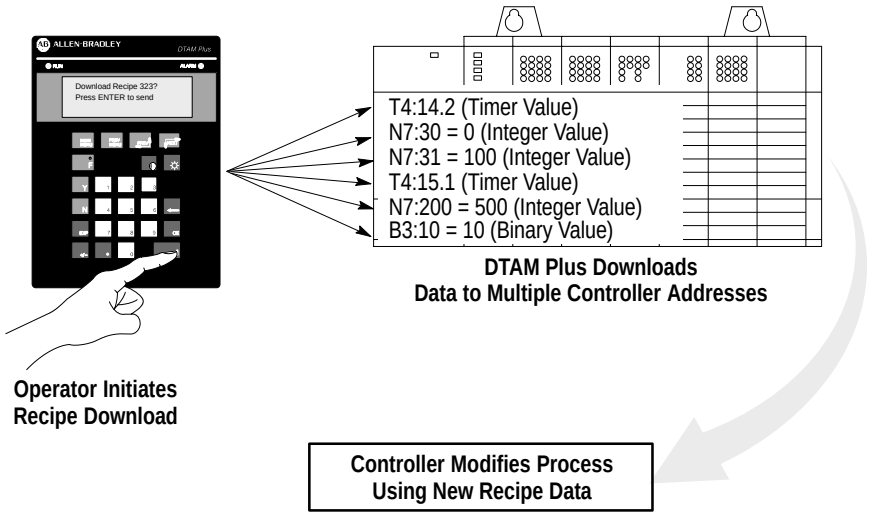
  key is not available for printing screens

- If keypad entry is enabled, you can enter the ASCII character's decimal equivalent value into the data entry field. The ASCII input is also enabled at the same time. This allows input from both sources. For example, an operator can manually enter 3 characters and then scan a bar code containing 8 characters. The DTAM would then write all 11 characters to the controller. Data is written to the controller on receipt of an ASCII carriage return or when the [RETURN] key is pressed.

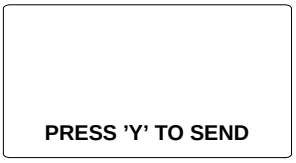
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Recipe Screens

Recipe screens allow the DTAM Plus to write to multiple controller addresses in one operation. Recipe screens can also be linked so that more than one recipe is downloaded.



Depending on how the application was designed, recipe screens will either automatically download data or display a prompt allowing the download to be initiated when [Y] is pressed.



Once the download is initiated, the DTAM Plus writes the recipe data to the various controller addresses. You cannot modify the recipe data that is sent, recipe data is specified by the application designer.

Alarm Screens

Alarm screens indicate conditions that are not expected during normal operation. Alarm screens are triggered when the controller writes the alarm screen number to the Advisor register or when triggered by the background monitor. Refer to page 4–2 for additional information on the Advisor option.

You must respond to an alarm screen before any other screens can be displayed. The [F] key (accessing function menu) will not operate while an alarm screen is displayed. Press [Y] to acknowledge the alarm.



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Chapter 5

Installation

Objectives

This chapter contains the following sections:

Section	Page
Safety Guidelines	5–1
Operating Environment	5–2
Enclosures	5–3
Equipment Required	5–3
Clearances	5–3
Mounting Dimensions	5–4
Cutout Template	5–5
Installation	5–6
Connecting Power	5–7

Safety Guidelines

Install the DTAM Plus using publication NFPA 70E, Electrical Safety Requirements for Employee Workplaces as a guide.

In addition, grounding is an important safety measure in electrical installations. A source for grounding recommendations is the National Electrical Code published by the National Fire protection Association of Boston Massachusetts.

Be certain to follow all directions for installing and connecting power to the DTAM Plus.

When used in a hazardous environment, the ultimate enclosure must be in accordance with Class 1, Division 2 wiring methods as described in the National Electrical Code (ANSI/NFPA 70) and the Canadian Electrical Code.

All peripheral equipment must be suitable for the location in which it is used.

For P1 powered units, use only a Class 2 power source as described in the National Electrical Code (ANSI/NFPA 70) and the Canadian Electrical Code.

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ATTENTION:
EXPLOSION HAZARD: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.

RISQUE D'EXPLOSION: LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE 1, DIVISION 2.

ATTENTION: USE P1 POWERED UNITS ONLY WITH CLASS 2 POWER SOURCE LIMITED TO 30 VDC OPEN CIRCUIT AND 8A SHORT CIRCUIT.

ATTENTION: UTILISER AVEC UNE TENSION D'ALIMENTATION CLASSE 2 DE 30 VCC MAXI EN CIRCUIT OUVERT AVEC UN COURANT DE COURT-CIRCUIT DE 8A MAXI.

ATTENTION:
EXPLOSION HAZARD: DO NOT CONNECT OR DISCONNECT EQUIPMENT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

RISQUE D'EXPLOSION: NE PAS BRANCHER OU DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.

Refer to the inside front cover of this manual for additional guidelines.

Operating Environment

The DTAM Plus is rated for an operating temperature range of:

- LCD displays – 32°F to 113°F (0°C to 45°C)
- VFD displays – 32°F to 140°F (0°C to 60°C)

The storage temperature range is -4°F to 185°F (-20°C to 85°C).
The humidity rating is 5% to 95% relative humidity (noncondensing).

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Enclosures

The terminal must be mounted in a panel or enclosure to protect the internal circuitry. The terminal meets NEMA Type 4, 12, 13 (indoor use only) or 4X (indoor 2707-V40P2N, -V40P2NR) ratings only when mounted in a panel or enclosure with the equivalent rating.

Allow enough spacing within an enclosure for adequate ventilation. For some applications, you may have to consider heat produced by other devices within a panel. The ambient temperature around the terminal must be maintained as specified above.

Make sure that provisions are made for accessing the back panel of the terminal for wiring, routine maintenance, and troubleshooting.

Equipment Required

Other than the tools required to make the panel cutout, the tools required for installation are:

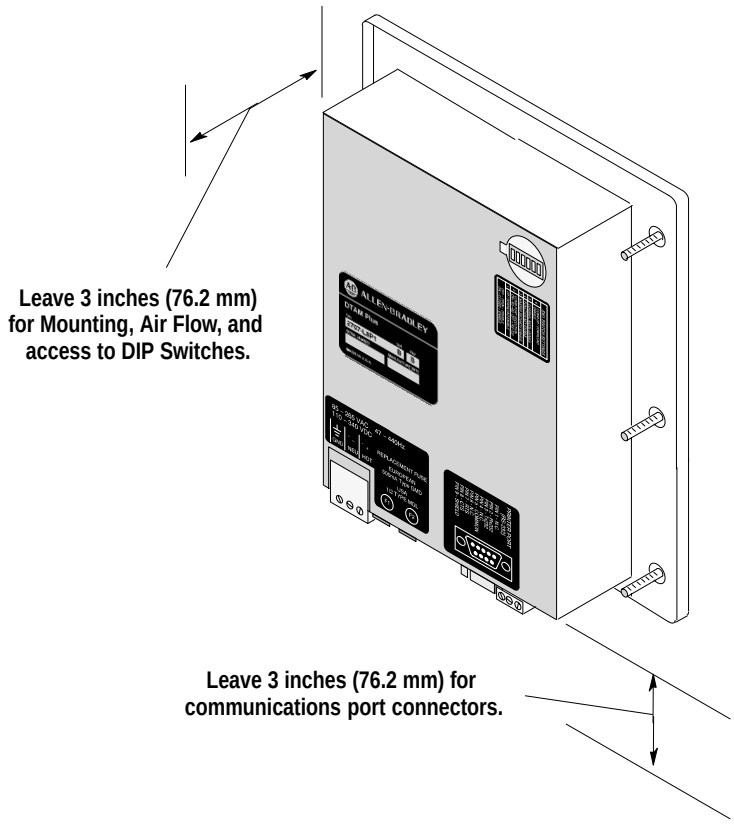
- 7mm (M4) deep well socket wrench or nut driver
- small slotted screwdriver
- torque wrench (in. / lbs).

The terminal is tightened against the panel with six self-locking nuts.

Clearances

Make sure that you leave adequate room, as shown in Figure 5.1, for mounting, air flow, cabling and access to DIP switches.

Figure 5.1
Recommended Clearances



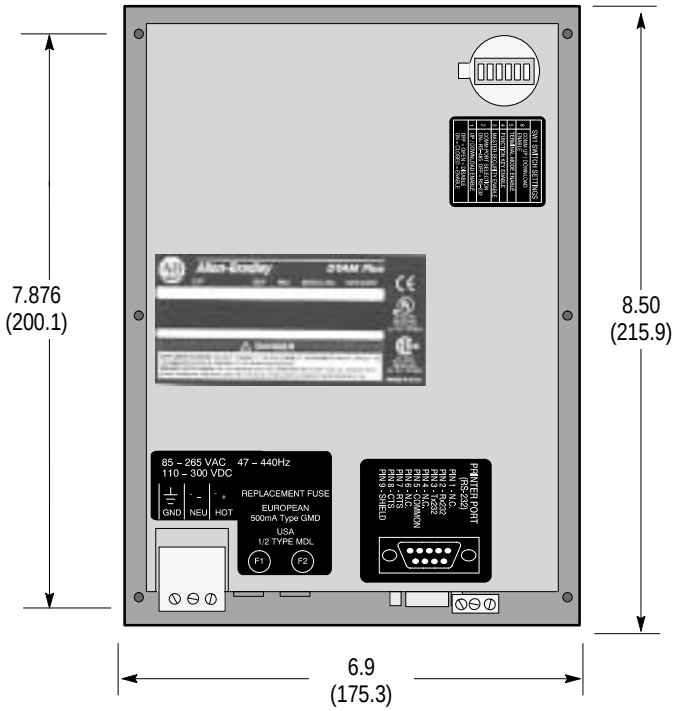
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Mounting Dimensions

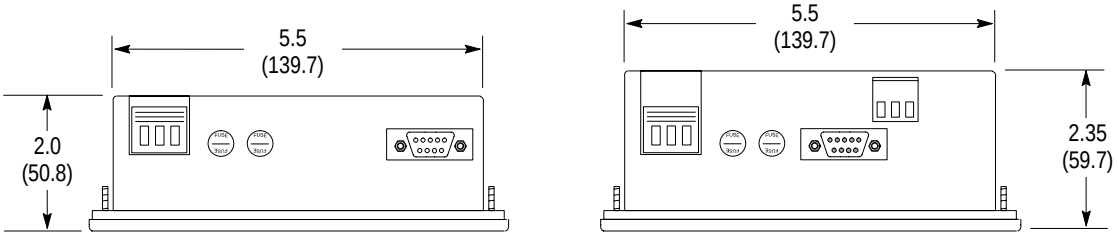
Figure 5.2 shows the mounting dimensions of the terminal.

Figure 5.2
Mounting Dimensions in Inches (Millimeters)

Back View



Bottom View



RS-232 / RS-485 Versions

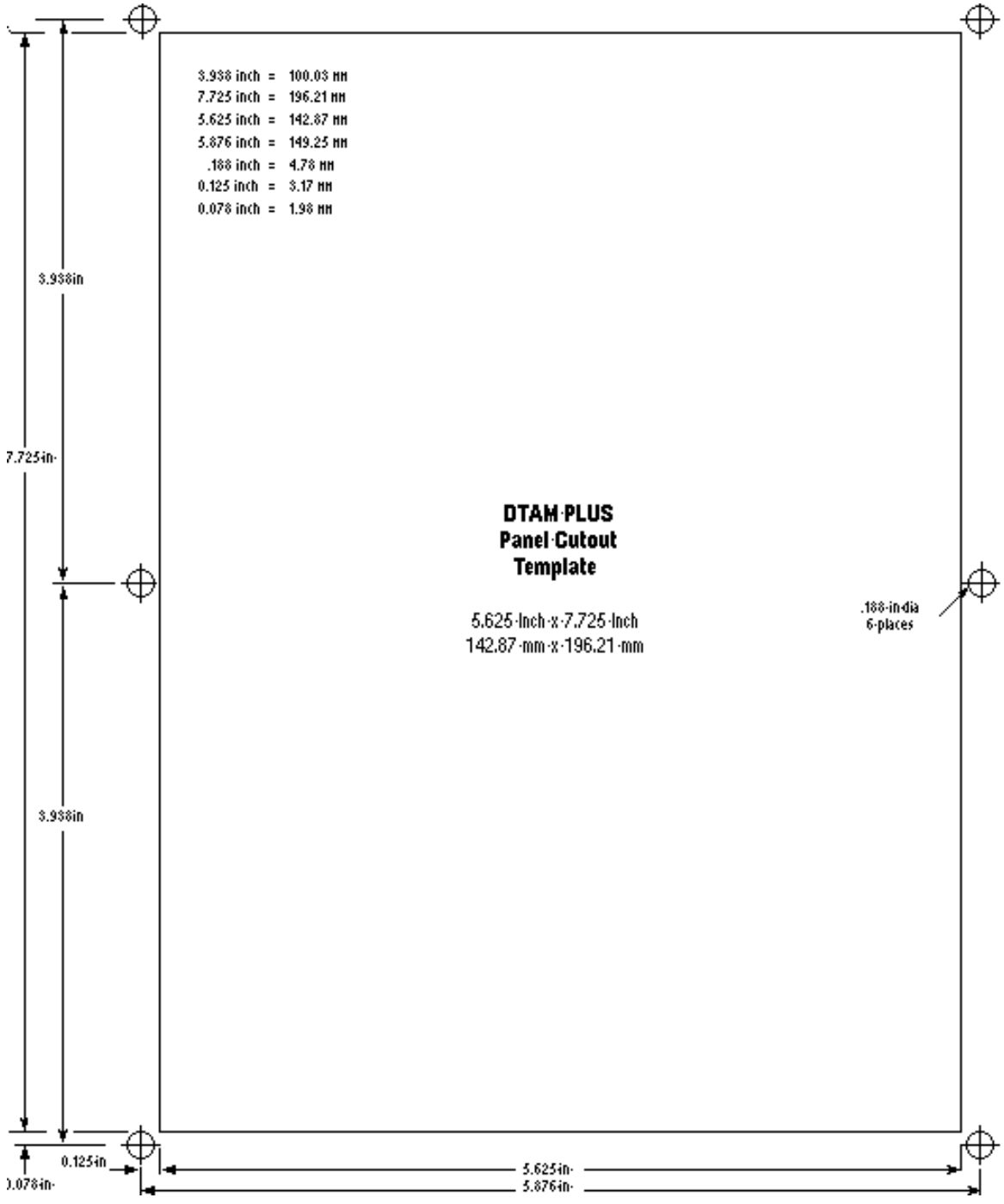
Remote I/O and DN Versions

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Cutout Template

A cutout template is provided on the inside back cover of this manual to mark the cutout dimensions. Figure 5.3 provides a reference copy, don't remove this page from the manual.

Figure 5.3
Panel Cutout Dimensions in Inches (Millimeters)



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Installation

To install the DTAM Plus Operator Module:

ATTENTION:
Disconnect all electrical power from the panel before making cutout.

Make sure that area around panel cutout is clear.

Take precautions so that metal filings or other debris do not fall into the DTAM Plus ventilation slots or enter any components that may already be installed in panel.

Make sure that no objects are inserted or fall into the terminal through the ventilation slots or DIP switch access hole.

Failure to follow these warnings may result in personal injury or damage to the panel components.

1. Cut an opening in the panel as shown in Figure 5.3. Use the cutout template located inside the back cover of this manual. Remove any sharp edges or burrs.
2. Make sure the sealing gasket is properly positioned on the DTAM Plus This gasket forms a compression type seal. Do not use sealing compounds.
3. Place the DTAM Plus in the panel cutout.

ATTENTION:
Mounting nuts must be tightened to a torque of 8 to 10 inch pounds to provide a proper seal and to prevent potential damage to the terminal. Allen-Bradley assumes no responsibility for water or chemical damage to the terminal or other equipment within the panel enclosure because of improper installation.

4. Install the six self locking mounting nuts hand tight.
5. Alternately tighten the mounting nuts until the DTAM Plus is held firmly against the panel. Tighten mounting nuts to a torque of 8 to 10 inch-pounds. Do not over-tighten nuts.

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Wire and Cable Length Restrictions

The following wire and cable length restrictions apply to DTAM products that are CE marked when used in installations that require compliance to European EMC Directive 89/336:

DC Power Wiring	10 meters
Ground Terminal Wire	3 meters
Communication Cables	30 meters

These restrictions apply to the following catalog numbers: 2707–L8P1 Series D, 2707–L40P1 Series D and 2707–V40P1 Series D.

- 2707–M232P3 Series E and 2707–M485P3 Series E
- 2707–L8P1 Series D, 2707–L40P1 Series D and 2707–V40P1 Series D

Connecting Power

The DTAM Plus accepts supply voltages in the following ranges depending upon the power supply designation.

- Versions with P1 power supply, accept 15-23V AC (47 to 440 Hz) or 20-30V DC
- Series D versions with P1 power supply only, accepts 20-30V DC
- Versions with P2 power supply, accept 85-265V AC (47 to 440 Hz) or110-300V DC

To connect the DTAM Plus to a power source:



ATTENTION: Verify that the power is disconnected from the power source before wiring. Failure to disconnect power may result in electrical shock.

Make sure that the supply voltage to the DTAM Plus is correct, refer to the voltage label on back of unit. The incorrect voltage may damage the DTAM Plus.

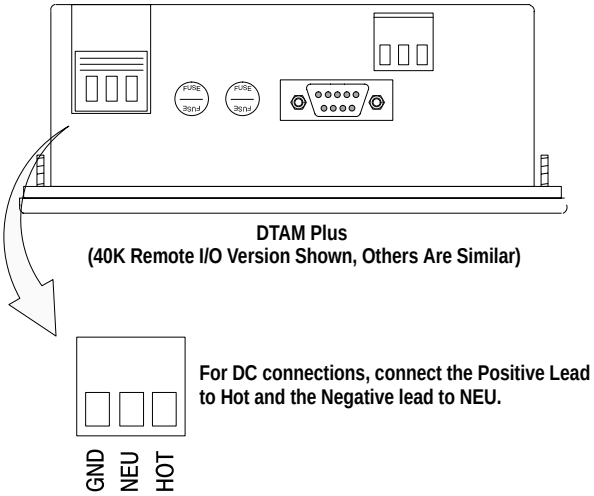
Do not overtighten the power connector screw terminals. Overtightening the terminals may damage the DTAM Plus.

1. Make sure that the voltage source is not turned on.
2. Use AWG#16 or #14 stranded wire to connect the DTAM Plus screw terminals to the power source (see below).

   Note: The power supply terminal block on the DTAM Plus is not removeable.

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Figure 5.4
Power Connections



3. Connect communications cabling as described in Chapter 6.
4. Apply voltage and verify the DTAM Plus powerup sequence as described in Chapter 2.

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Chapter 6

Communication Connections and Setup

Chapter Objectives

This chapter describes how to connect the DTAM Plus to peripheral devices. It contains the following sections:

Section	Page
Wiring Guidelines	6–1
Connecting RS-232 Devices	6–2
Connecting RS-485 Devices	6–3
Connecting Remote I/O Devices	6–5
Communicating with a Logic Controller	6–6
RS-232 or RS-422 Communications with a PLC-5	6–7
RS-232 Communications with an SLC 5/03, –5/04	6–8
DH-485 Communication with an SLC 500 or Network	6–9
RS-232 Communications with a MicroLogix 1000	6–10
RS-485/DH-485 Communications with a MicroLogix 1000	6–11

Wiring Guidelines

Here are some recommendations on how to reduce electromagnetic noise on the communications connections:

- Careful wire routing helps reduce or minimize electrical noise. Route incoming power to the terminal by a separate path from the communications cables.
- Do not run communications wiring and power wiring in the same conduit.
- Where communications and power wiring must cross, make their intersection perpendicular.
- Proper grounding helps to reduce the effects of noise due to Electromagnetic Interference (EMI). To avoid problems caused by EMI, all cables must be shielded and grounded at one end. Grounding is also an important safety measure in electrical installations.

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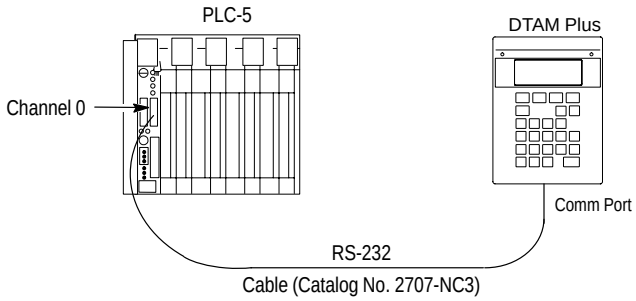
Connecting RS-232 Devices

The RS-232 Comm port of the DTAM Plus allows point-to-point communications with:

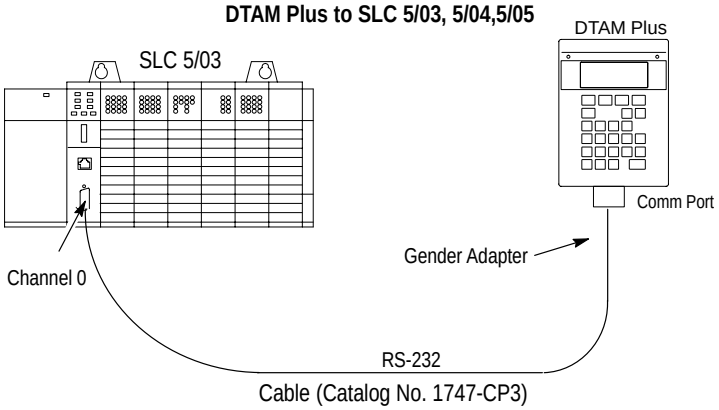
- PLC-5 Channel 0 (configured as RS-232 port)
- SLC 5/03, 5/04, 5/05 Channel 0 (configured as RS-232 port)
- MicroLogix 1000

The figure below shows typical RS-232 connections.

DTAM Plus to PLC5 Channel 0



DTAM Plus to SLC 5/03, 5/04,5/05



To connect the DTAM Plus to an RS-232 device:

1. Make sure that the DTAM Plus is not connected to a voltage source.
2. Use the proper cabling to connect the DTAM Plus Comm port to the port of the controller (PLC-5 channel 0 or SLC 5/03 RS-232 port).
   - Use cable, Catalog No 2707-NC3 for PLC-5 channel 0 connection.
   - Use cable, Catalog No. 1747-CP3 for SLC 5/03, 5/04, 5/05 port connection.
     This cable requires a 9-pin female to male gender adapter.

   If you need to make your own cable, refer to the cable diagrams in Appendix B. The maximum recommended cable length is 50 feet (15.2 meters).
3. Make sure that the communication parameters of the DTAM Plus match the host device.
4. Apply power and verify that communications are established.

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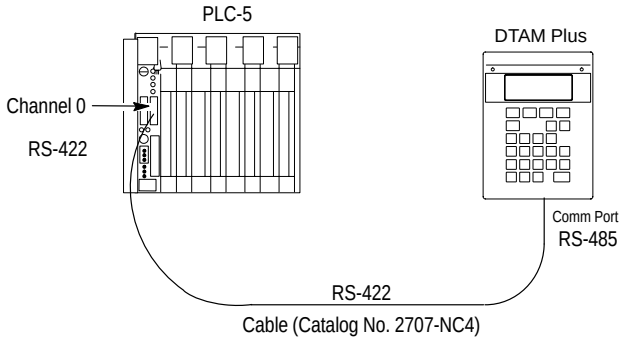
Connecting RS-485 Devices

The RS-485 Comm port allows:

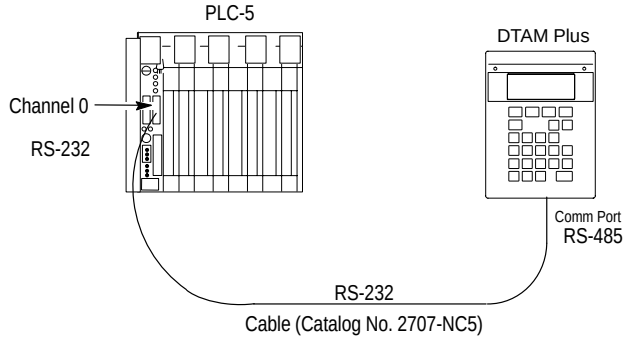
- Point-to-point communications with a PLC-5 Channel 0 port
- Point-to-point or multidrop communications with an SLC controller DH-485 port
- MicroLogix 1000 using the AIC+ Interface

The figure below shows typical RS-485 connections.

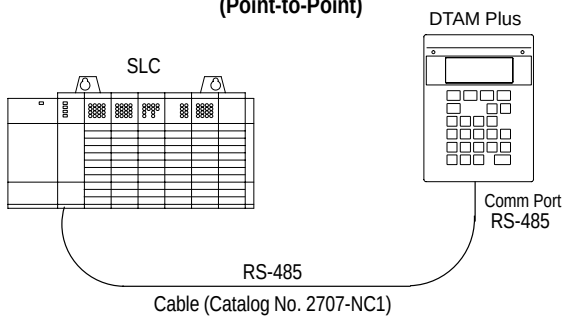
DTAM Plus to PLC5 Channel 0 (Point-to-Point Only)



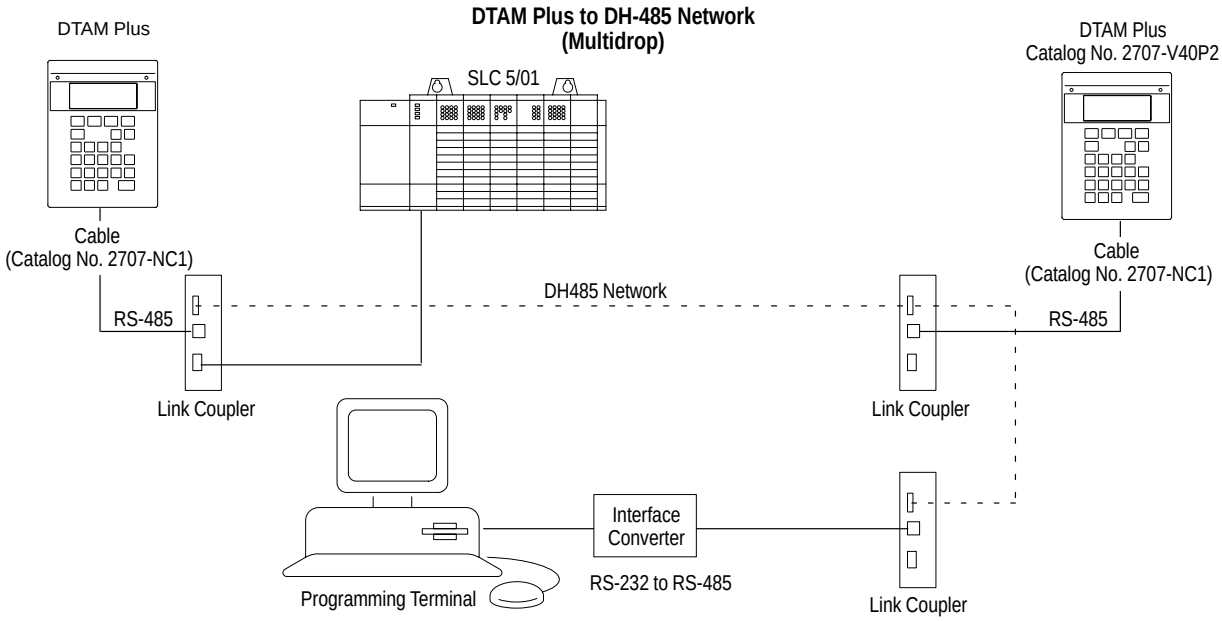
DTAM Plus to PLC5 Channel 0 (Point-to-Point Only)



DTAM Plus to Single SLC (Point-to-Point)



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To connect the DTAM Plus terminal to an RS-485 device:

1. Make sure that the power to the DTAM Plus is off.
2. Use the proper cabling to connect the DTAM Plus communications port to the port of the controller (PLC-5 channel 0 or SLC 5/03 or SLC 5/04 RS-232 port).
   - Use cable, Catalog No. 2707-NC4 for PLC-5 channel 0 RS-422 connection
   - Use cable, Catalog No. 2707-NC5 for PLC-5 channel 0 RS-232 connection. The 2707-NC5 cable converts the signals from the RS-485 port to RS-232 levels.
   - Use cable, Catalog No. 1747-CP3 for SLC 5/03, 5/04, 5/05 port connection

   If you need to make your own cable, refer to the connection diagrams in Appendix B. The maximum cable length is 200 feet (60.8 meters).

   Important: The DH-485 network cable requires proper shielding, grounding, and termination. Refer to Data Highway / Data Highway Plus / Data Highway-485 Cable Installation Manual (Pub. No. 1770-6.2.2).
3. The DH-485 connectors are not electrically isolated. If electrical isolation is required, use Link Couplers (Catalog No. 1747-AIC) shown above.



ATTENTION: Electrical isolation using Link Couplers (Catalog No. 1747-AIC) is required in applications where the distance between the DTAM Plus terminal and the SLC is greater than 6.5 feet (2 meters).

4. Make sure that the communication parameters of the DTAM Plus terminal match the host device.
5. Apply power and verify that communications are established.

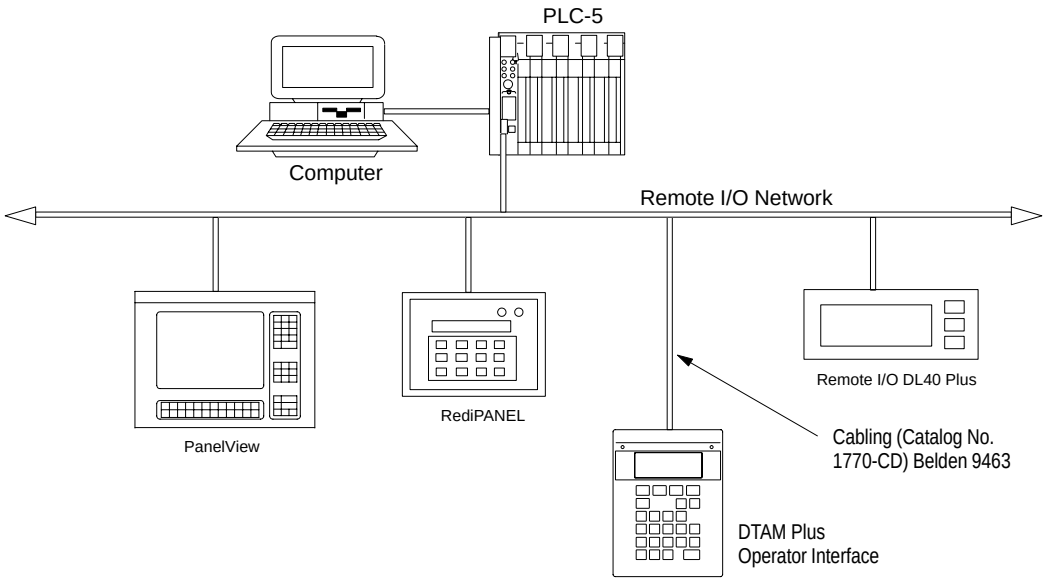
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Connecting Remote I/O Devices

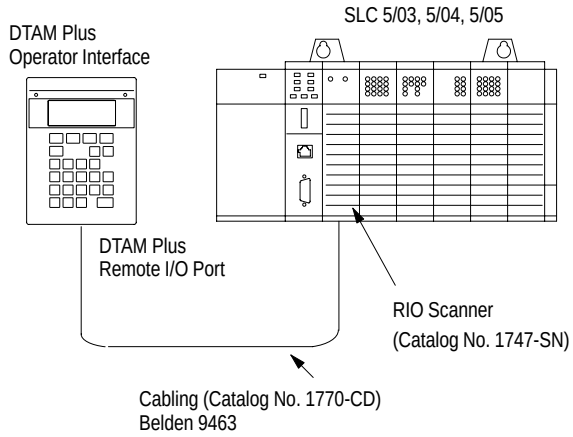
The Remote I/O port of the DTAM Plus provides access via a Remote I/O link directly to a controller or subscanner. Use cable (Catalog No. 1770-CD) Belden 9463 for all Remote I/O connections. Refer to Publication No. 1770-4.1 for detailed grounding and wiring guidelines. The user manual for your controller or subscanner will also provide cabling instructions.

The following figures show typical Remote I/O connections.

DTAM Plus to an Remote I/O Link



DTAM Plus to an SLC 5/03, 5/04, 5/05 Remote I/O Scanner



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Communicating with a Logic Controller

The DTAM Plus supports four operating systems.

- Remote I/O
- PLC5-DF1
- AB BASIC
- AB DH-485 protocol

The type of operating system supported by the DTAM Plus depends upon its communication configuration.

DTAM Plus Version	Operating System	Controller Type
RS-485 / RS-232 Versions (Catalog No. 2707-L8P1, -L8P2, -L40P1, -L40P2, -V40P1, -V40P2, -V40P2N)	PLC5 DF1 AB DH485	PLC-5 Family channel 0 port (RS-422) ① SLC Family DH-485 port DH-485 network SLC 5/03, 5/04 serial port
Remote I/O Versions (Catalog No. 2707-L8P1R, -L8P2R, -L40P1R, -L40P2R, -V40P1R, -V40P2R, -V40P2NR)	Remote I/O	PLC / SLC Controllers with Remote I/O link or subscanner.

① The DTAM Plus RS-485 port supports RS-422 communication with the PLC-5. RS-422 communication is limited by the PLC to 19.2K baud and a distance of 200 feet (61 meters).

The operating system is selected when an application is created. Applications are downloaded with the applicable operating system. If you download an application that has a different operating system than the current operating system in the DTAM Plus, you are prompted to download the new operating system. Refer to Chapter 2 for additional information.

Communications Parameters

The communication settings of the DTAM Plus must be set to match the SLC, PLC, or DH-485 network. You can set the following parameters (as described in Chapter 3):

Parameter	Selections
Baud Rate	300, 1200, 2400, 4800, 9600, 19200, 38400
Data Bits	7 or 8
Parity	None, Odd, and Even

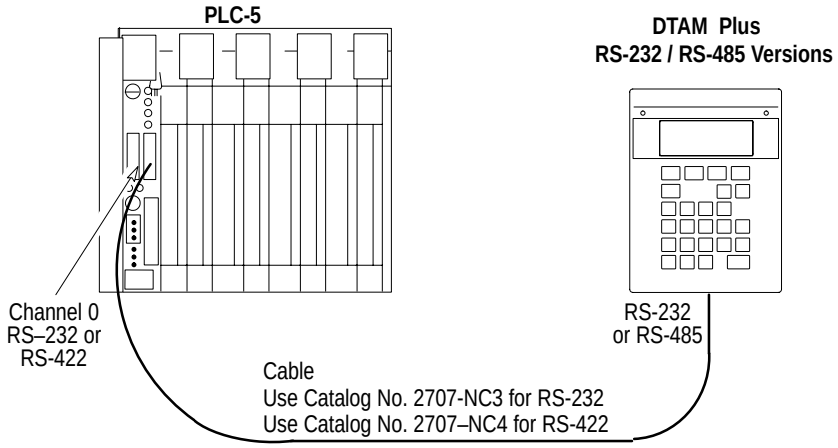
Remote I/O versions of the DTAM Plus support direct links to a PLC scanner or subscanner module. The DTAM Plus appears to the PLC as a standard 1771 I/O rack.

Remote I/O Communications Parameters	Options
Baud Rate	57.6K, 115.2K, 230.4K
Rack Size	$^1/_4$, $^1/_2$, $^3/_4$, Full

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RS-232 or RS-422 Communications With a PLC-5

The DTAM Plus and PLC-5 must be set as follows for communications to occur:



DTAM Plus

The DTAM Plus must have an application with a PLC-5 (DF1) operating system installed. The Baud Rate and Parity of the DTAM Plus and PLC-5 must be the same. The DTAM Plus can use either the RS-232 or RS-485 port:

DTAM Plus Comm Port	PLC Channel 0
RS-232	RS-232
RS-485	RS-422

PLC-5

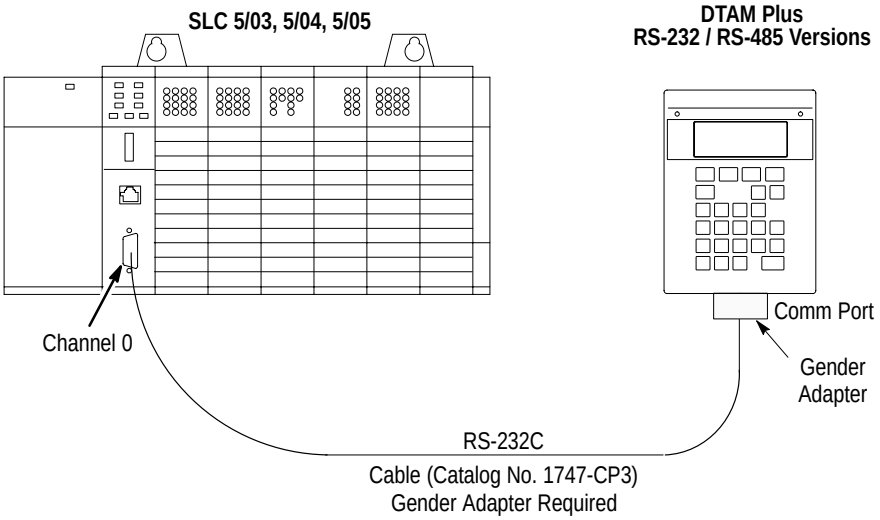
Channel 0 must be set as follows (NA = Not Applicable):

Parameter	Setting	Comments
Channel Configuration Option	System DF1 Pt-Pt	Required for proper operation.
Diagnostic File	3-999	Must be a unique integer file number.
Remote Mode change	Disabled	Required for proper operation.
Mode Atten. Character	NA	Not used with Remote Mode disabled.
System Mode Character	NA	Not used with Remote Mode disabled.
User Mode Character	NA	Not used with Remote Mode disabled.
Baud Rate	See Comments	DTAM Plus must be set the same.
Stop Bits	1	Required for proper operation.
Parity	See Comments	DTAM Plus must be set the same.
Control Line	No Handshaking	Required unless communication cable loops back control signals.
Duplicate Detect	NA	User definable per system requirements.
ACK Timeout	NA	User definable per system requirements.
Message Timeout	NA	User definable per system requirements.
Error Detect	CRC	Required for proper operation.
NAK Receive	NA	User definable per system requirements.
DF1 ENQs	NA	User definable per system requirements.

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RS-232 Communications with an SLC 5/03, -5/04, -5/05

The DTAM Plus and RS-232 port of the SLC 5/03, 5/04, 5/05 must be set as follows for communications to occur:



DTAM Plus

The DTAM Plus must have an application with AB DH485 operating system installed. The Baud Rate and Parity of the DTAM Plus and the SLC 5/03, 5/04, 5/05 must be the same. **We recommend you use 19200 baud, even parity, and 8 data bits to match the default settings of an SLC 500 controller.**

SLC 5/03, 5/04, 5/05

Make sure that the channel 0 port of the SLC controller is set for DH-485 MASTER using the following parameters.

Parameter	Selections	Recommended
Baud Rate	1200, 2400, 9600, 19.2K	19.2K
Node Address	0 to 31	1①
Maximum Node Address	0 to 31	1①
Token Hold Factor	1 to 4	1
Diagnostic File Number	0 to 255	Any
Parity	None, Odd, or Even	Even②
Data Bits	7 or 8	8

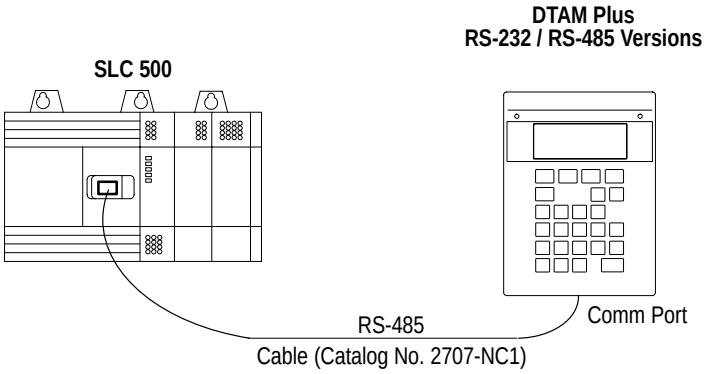
① To provide maximum response times, we recommend that the DTAM Plus be set as node 0 and the SLC 500 channel 0 as node 1. Maximum node address should be 1. The connections are a completely separate DH-485 network, you do not need to be concerned about duplicate node addresses from another network.

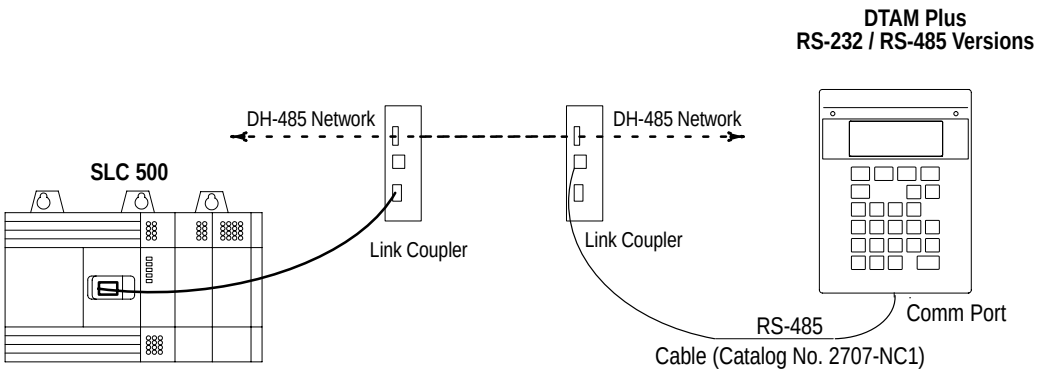
② SLC 5/03, 5/04, 5/05 (channel 0) only support EVEN parity.

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DH-485 Communications with an SLC 500 or Network

The DTAM Plus and SLC 500 DH-485 port must be set as follows for communications to occur. If you are using an SLC 5/03, 5/04, 5/05 RS-232 port, refer to the previous section.





DTAM Plus

The DTAM Plus must have an application with the AB DH485 operating system installed. The baud rate, parity, and data bits of the DTAM Plus and DH-485 network (or SLC 500) must be set the same. **We recommend you use 19200 baud, even parity, and 8 data bits to match the default settings of an SLC 500 controller.**

If the DTAM Plus module is installed on a DH-485 network that has a large number of nodes connected and there is heavy network traffic, the network may produce NAK NOMEM commands. Three consecutive NAK NOMEM commands will produce a 10H error on the DTAM Plus module. Pressing the enter key or resetting the module is required to resume operation.

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SLC 5/03, 5/04, 5/05 (channel 0)

Make sure that the SLC DH-485 port is configured as follows:

Parameter	Selections	Recommended
Baud Rate	1200, 2400, 9600, 19.2K	19.2K
Node Address	0 to 31	Next lowest address on the network. Set to 1 for point-to point communications ①.
Maximum Node Address	0 to 31	Set to maximum node on network. Set to 1 for point-to point communications ①.
Token Hold Factor	1 to 4	1
Diagnostic File Number	0 to 255	Any
Parity	None, Odd, or Even	Even②
Data Bits	7 or 8	8

① For maximum response times on point-to-point networks, we recommend:

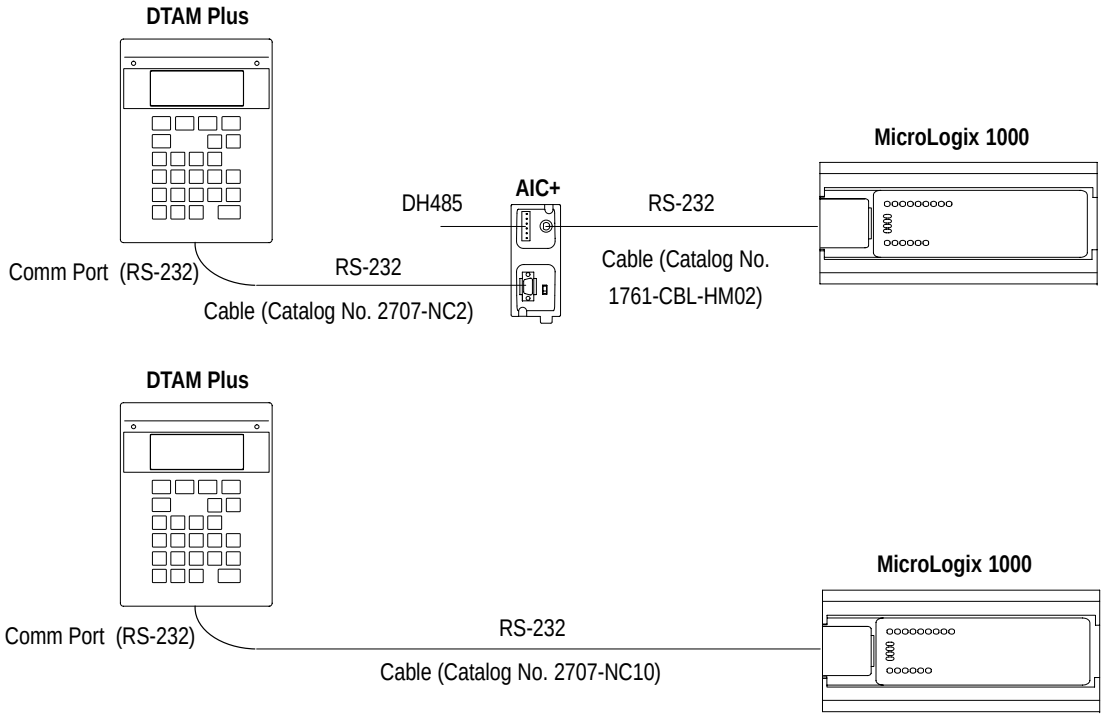
To transfer data quickly from the SLC 500 to the DTAM set as the SLC as node 0 and the DTAM as node 1. Maximum node address should be 1.

To transfer data quickly from the DTAM to the SLC 500 set as the DTAM as node 0 and the SLC as node 1. Maximum node address should be 1.

② SLC 5/03, 5/04, 5/05 (channel 0) only supports EVEN parity.

RS-232 Communications with a MicroLogix 1000

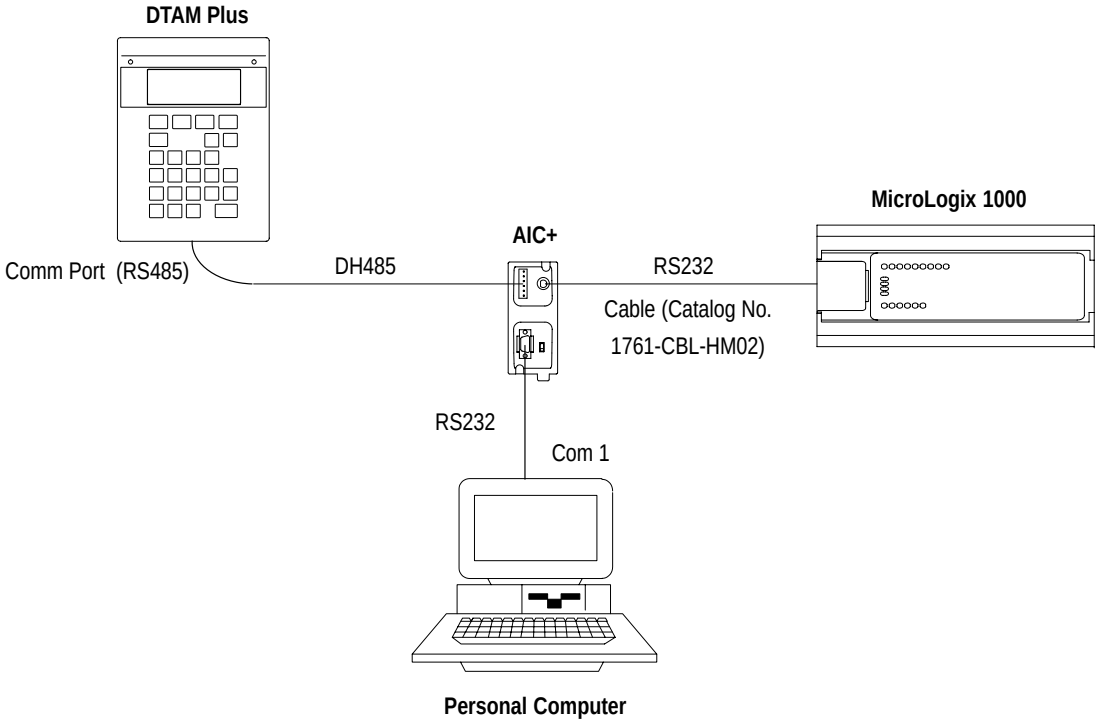
The DTAM Plus must be set as follows for communication to occur. The DTAM module uses DH485 protocol but the comm port is set for RS-232 (switch 1 position 2 is open).



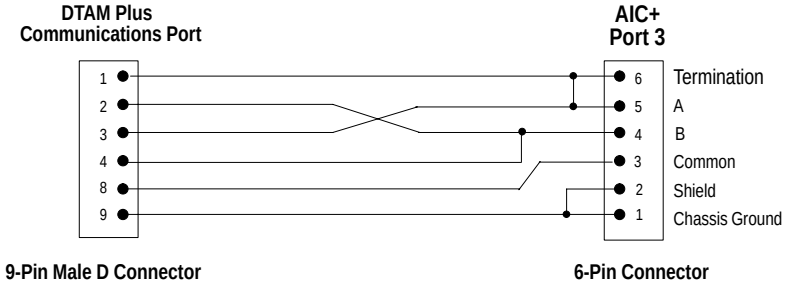
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RS–485/DH–485 Communications with a MicroLogix 1000

The DTAM Plus must be set as follows for communication to occur. The DTAM module uses DH485 protocol but the comm port is set for RS-485 (switch 1 position 2 is on). This is a 3-node network and is not expandable.



You will need to construct a cable that connects to the AIC+ and the DTAM Plus/Micro. Refer to the following illustration.



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Chapter 7

Troubleshooting and Maintenance

Chapter Objectives

This chapter describes how to isolate and correct the most common operating problems and routine maintenance tasks. It contains these sections:

Section	Page
Troubleshooting Recommendations	7–1
Equipment Required	7–1
Common Operating Problems	7–2
Error Messages	7–2
Communication Error Codes	7–4
Using the Test Functions	7–5
DIP Switch Test	7–6
Display Test	7–7
Keyboard Test	7–8
Comm Port Test	7–9
Printer Port Test	7–10
Display Control Test	7–11
RAM Test	7–12
System Memory Test	7–13
Program File Test	7–14
Clock/Calendar Test	7–15
TXEN Test	7–16
Cleaning the display window	7–17

Troubleshooting Recommendations

Most errors are accompanied by an error message. Find the error message in the error message listing and perform the recommended corrective action.

If you encounter a problem that is not listed in the table, contact your local Allen-Bradley distributor for assistance.



ATTENTION: Make sure that no objects are inserted or fall into the DTAM Plus through the ventilation slots or DIP switch access hole. Always disconnect power when checking wiring connections. Failure to take adequate precautions may result in severe electrical shock or equipment damage.

Equipment Required

Other than verifying that the correct power source is connected to the DTAM Plus (use a voltmeter), no electronic diagnostic equipment is required for troubleshooting.

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Common Operating Problems

If there is no display on the DTAM Plus, verify that the proper voltage is present at the DTAM Plus power supply terminal block (check label on back of unit). If no voltage is present, check the power to/from the power source.

The most common DTAM Plus problems are related to cabling configurations and the communication parameters (baud rate, data bits, parity). These parameters must be identical for both the DTAM Plus and the controller. Cabling and the communications parameters are always the first things to check.

If the communications cabling and communications parameters are correct, perform the diagnostic tests (described in this chapter) to verify that the DTAM Plus is functioning properly.

Error Messages

Refer to the following table when the DTAM Plus displays an error message.

Message	Probable Cause(s)	Corrective Action(s)
Checksum:failed	Read Only Memory (ROM) is incorrect.	Possible defective ROM. Reset the DTAM Plus and re-check. If problem still exists, re-download the operating system through the programming software. If problem still exists, send DTAM Plus for repair.
RAM fail	RAM memory failed write or read test.	Reset the DTAM Plus and re-check. If problem still exists, send DTAM Plus for repair.
Check-sum: nnnn (CFG) Check-sum: nnnn (DTAM Plus) *.CFG File Invalid	Application file checksum is incorrect.	Possible bad application file. Download the application (.CFG) file and re-check.
Watch Dog Fault Push Key to Continue	Watch dog timer not within specs.	If problem persists, send DTAM Plus for repair.
Watch Dog Fault Push Key to Reset	Watch dog timer timed out or pass bits not set.	If problem persists, send DTAM Plus for repair.
Allen-Bradley SLC 50X Establishing Comm	Attempting to communicate with an SLC.	Normal display when initiating communications with an SLC.
Allen-Bradley SLC 50X (or PLC-5) Establishing Comm	Attempting to communicate with a PLC.	Normal display when initiating communications with a PLC.
Allen-Bradley RIO SCANNER NOT FOUND	No communications with Remote I/O link.	Check cabling and communications parameters to verify that the controller matches those of the DTAM Plus.
SLC not found	This display is displayed after a 2 second interval of attempting to establish communications with the SLC.	Communications not established with the SLC. Check cabling and communications parameters to verify that the SLC matches those of the DTAM Plus.
PLC not found	This display is displayed after a 2 second interval of attempting to establish communications with the PLC.	Communications not established with the PLC. Check cabling and communications parameters to verify that the PLC matches those of the DTAM Plus.
Communication Loss Press ENTER to Reset	Communication with the SLC was lost after 16 retry attempts.	Check DTAM Plus to controller cabling. Check SLC operating conditions.

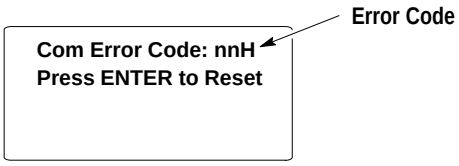
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Message	Probable Cause(s)	Corrective Action(s)
Com Error Code: nnH Press ENTER to Reset	Communication error code (nn)	Received a controller error code. Refer to next section for error codes.
Attempt Was Made to 'Call' An Invalid Or Unprogrammed Screen	Illegal or unprogrammed screen type detected (.CFG file error).	Check the program (.CFG) file and download. Check screen links.
NAchip Set:Failed	Internal fault.	Contact Allen-Bradley for technical support.
Not Programmable	Master code is 99999999 and is not user-programmable.	A master code number of 99999999 may not be changed from the keypad. Download a new, valid master code number (using DPS Programming Software).
Not Responding Press "Y" to Reset "ENTER" To Continue	Communications fault.	Check cabling and retry.
Incorrect Master Code	Master code entry did not match.	The master code entered did not match the master code of the program file.
Invalid File Type <Check CFG File> Press "Y" to Reset	Attempt was made to access an invalid file type.	Check application file. Refer to DPS user manual for the file types that can be accessed.
Invalid Security Code Access Denied	Master code or screen code did not match.	Either an incorrect master security code or a screen-code that did not match the programmed screen code was entered. Try again.
Loop Error XX	The Communications Port test the transmitted character did not match the received character. The transmitted character is displayed.	Verify that the loopback connector is connected to the Communication and/or Printer Ports. If the loopback connectors are in place, possible damage to the port drivers has occurred, send unit for repair.
** Input Error ** Press a Key to Cont. The low and high data values are then displayed in one of two formats: Low Lim High Lim XXXXXX XXXXXX Low XXXXXXX High XXXXXXX	The data entered is not within the programmed limits. The programmed Low and High limits are displayed.	Verify that the displayed limits are as programmed for the entry field. Re-enter data within the entry limits.
READ ONLY	The controller location is not configured for a Write function (P-A/D function).	Verify that the controller location being accessed by the P-A/D is acceptable for Write functions.
Prog SW/OI Version Mismatch -OI Locked	An incorrect unlock code sent by DTAM Plus Programming Software. Wrong version of DTAM Plus Programming Software	Verify that the version of DTAM Plus Programming Software is compatible for the controller type supported by the DTAM Plus.
Password Inhibited	Controller has at least one ladder program file that is password protected.	Remove password protection.
Working (Displayed for Long Period)	Comm port setting may be incorrect DH-485 communication problems Data entry screen has no data entry field	Check communication settings. Verify connections and settings. Reload corrected application file.

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Communication Error Codes

Communication Error Codes appear on the DTAM Plus display as follows:



The error code is in the form:

- nnH for SLC controllers that do not show extended error codes.
- X nnH for PLC controllers. The X indicates an extended error code.

The communication error codes provide valuable information when other symptoms either have not been discovered or have not been understood.

Note: For a complete list of error codes, consult the user manuals for your Allen-Bradley controller.

The communication error codes specific to the communication protocols are described below.

Code (Hex)	Meaning
10	Illegal Format. No File, unknown command, address out of range or memory not allocated.
50	Address Problem. SLC 500/501 out of physical memory. SLC 502 out of executable memory.
60	Disallowed due to command protection. Not program owner, file not open for Read/ Write directory, target file open.
07	Illegal size. Source program is larger than destination.
0E	Failed Longitudinal Redundancy Check (LRC).
0B	Access Denied. Not in program mode.
0C	Resource not available. No MemMod, in faulted mode, no forces installed.

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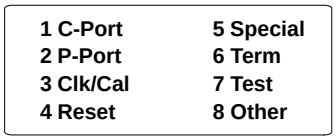
Using the Test Functions

Use the test selection screen to test or check the following:

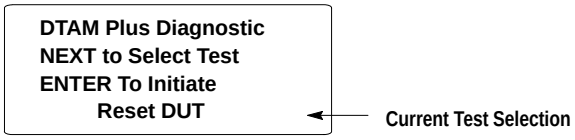
- Reset DUT (resets terminal, terminates test function)
- DIP switch positions
- Display
- Keyboard
- Comm port
- Printer port
- Display control
- Random Access Memory
- System memory
- Program file
- Clock/calendar
- Transmit enable & Alarm

To access the test functions:

1. Access the Test functions from the Functions Menu.



The test screen appears:



2. Use the [NEXT] and [PREV] keys to scroll through the test options. Display the test you want to perform.
3. Press [↵] to initiate the test.
4. To terminate the test, press the [NEXT] and [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

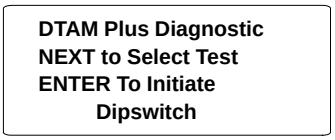
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DIP Switch Test

Use the DIP switch test to verify the DIP switch positions.

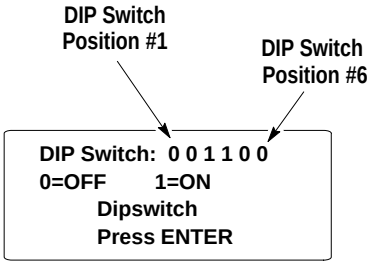
To perform the DIP switch test:

1. Use the [NEXT] and [PREV] keys to display DIP Switch on the test selection screen.



2. Press [↵] to initiate the test.

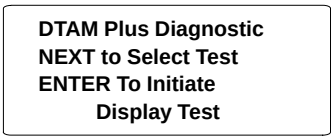
   The DTAM Plus displays the current DIP switch settings.



   The 6 positions of the DIP switch are shown in binary format (0 = Off, 1 = On). The leftmost value represents DIP switch position #1.

   Note: Position #6 is always shown as 0 regardless of the setting. This switch position is not used

3. Press ↵ to terminate the DIP switch test and display the next test selection screen:



4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

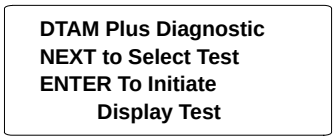
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Display Test

Use the display test to verify that each screen pixel is operating properly.

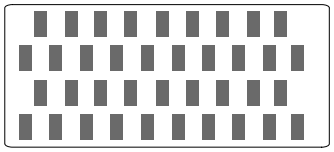
To perform the display test:

1. Use the [NEXT] or [PREV] keys to show Display on the test selection screen.



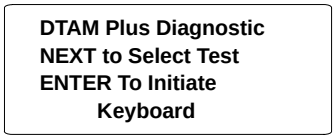
2. Press [◄┘] to initiate the test.

   The DTAM Plus turns all pixels on and then off. Then an alternate checkerboard pattern is displayed:



3. Press [◄┘] to terminate the test.

   The next test selection screen is displayed.



4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [◄┘] to reset the DTAM Plus.

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Keyboard Test

Use the keyboard test to verify that the keyboard is functioning properly.

To perform the keyboard test:

1. Use the [NEXT] or [PREV] keys to display Keyboard on the test selection screen.

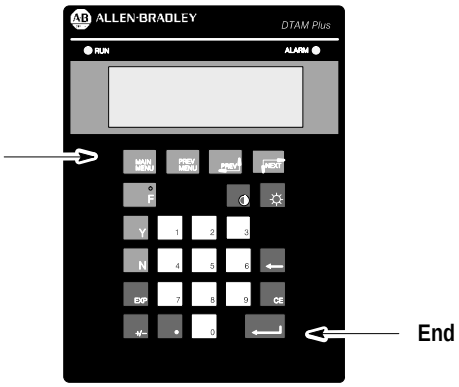
```
DTAM Plus Diagnostic
NEXT to Select Test
ENTER To Initiate
      Keyboard
```

2. Press [↵] to initiate the test.

   The DTAM Plus prompts you to press each key in a sequential order.

```
Press "MAIN MENU"
```

3. Press the keys as prompted form left to right beginning at the top.



   You must press all of the keys in the order prompted. If you press the wrong key, you must start over with the first key.

4. Pressing the last key in the sequence terminates the keyboard test.

   The next test selection screen is displayed.

```
DTAM Plus Diagnostic
NEXT to Select Test
ENTER To Initiate
      Comm Port
```

5. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

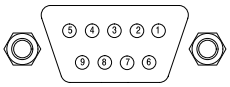
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Comm Port Test

Use the communications test to verify the operation of the RS-232/ RS-485 Comm port.

The communications test requires a loopback connector. You can construct a simple loopback connector as follows:

RS-232 Port
9 Pin Female

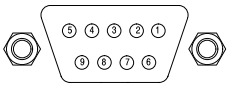


Pin#	Signal Name
1	Not Used
2	Receive Data (RD)
3	Transmit Data (TD)
4	Not Used
5	Signal Ground
6	Not Used
7	Not Used
8	Not Used
9	Shield

Loopback Connector

Connects pins 2 →3

RS-485 Port
9 Pin Female



Pin#	Signal Name
1	Data Out –
2	Data Out +
3	Data In -
4	Data In +
5	Signal Ground
6	Transmit Enable
7	Not Used
8	Signal Ground
9	Shield

Loopback Connector

Connects pins 1 →3

and pins 2 → 4

To test the Comm port:

1. Use the [NEXT] or [PREV] keys to display Comm on the test selection screen.
2. Press [↵] to initiate the test.

   The DTAM Plus will continuously send out and receive a message at the same port. The message is **DTAM Plus self looping serial test ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789**.

   DTAM Plus self loop
   ing serial test ABCD

3. Press any key to terminate the Comm Port test.

   The next test selection screen is displayed.

   DTAM Plus Diagnostic
   NEXT to Select Test
   ENTER To Initiate
   Printer Port

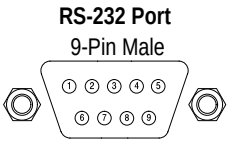
4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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Printer Port Test

Use the Printer Port test to verify the operation of the printer port

The test requires a loopback connector. You can construct a simple loopback connector as follows:



Pin#	Signal Name	Loopback Connector
1	Not Used	
2	Receive Data (RD)	Connects pins 2 →3
3	Transmit Data (TD)	
4	Not Used	
5	Signal Ground	
6	Not Used	
7	Not Used	
8	Not Used	
9	Shield	

To test the printer port:

1. Use the [NEXT] or [PREV] keys to display Printer Port on the test selection screen.

   DTAM Plus Diagnostic
   NEXT to Select Test
   ENTER To Initiate
   Printer Port

2. Press [↵] to initiate the test.

   The DTAM Plus will continuously send out and receive a message at the same port. The message is **DTAM Plus self looping serial test ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789**.

   DTAM Plus self loop
   ing serial test ABCD

3. Press any key to terminate the test.

   The next test selection screen is displayed.

   DTAM Plus Diagnostic
   NEXT to Select Test
   ENTER To Initiate
   Display Control

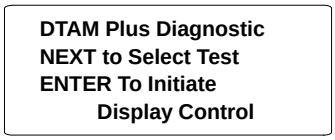
4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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Display Control Test

Use the Display Control test to test the brightness and contrast settings of the display.

1. Use the [NEXT] or [PREV] keys until Display Control appears on the test selection screen.

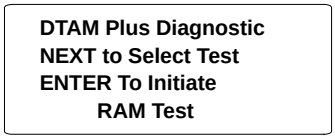


2. Press [↵] to initiate the test.

   The DTAM Plus flashes the following message in each of the 4 contrast and display settings:



   When done, the screen displays the next test selection.



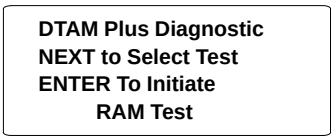
3. To terminate the test function , press the [NEXT] and [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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RAM Test

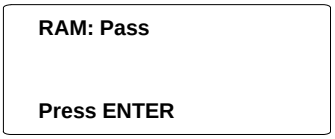
Use the RAM test to verify the DTAM Plus Random Access Memory.

1. Use the [NEXT] or [PREV] keys to display RAM on the test selection screen.



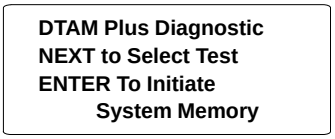
2. Press [↵] to initiate the test.

   The DTAM Plus displays either a Pass or Fail message.



3. Pressing [↵] terminates the RAM test.

   The next test selection screen is displayed.



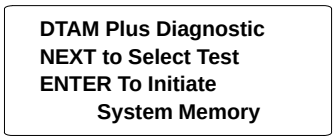
4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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System Memory Test

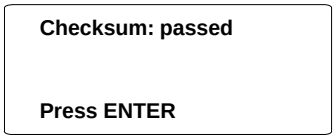
Use the System Memory test to verify the checksum of the operating system.

1. Use the [NEXT] or [PREV] keys to display System Memory test on the test selection screen.



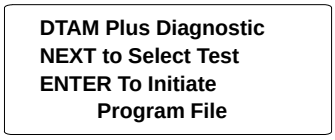
2. Press [↵] to initiate the test.

   The DTAM Plus displays either a Pass or Fail message.



3. Pressing [↵] terminates the System Memory test.

   The next test selection screen is displayed.



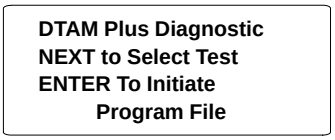
4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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Program File Test

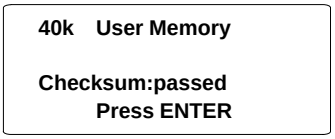
Use the Program Memory test to verify the checksum of the current application file.

1. Use the [NEXT] or [PREV] keys to display Program File test on the test selection screen.



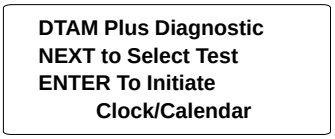
2. Press [↵] to initiate the test.

   The screen displays the amount of memory in the DTAM Plus and performs a checksum test.



3. Pressing [↵] terminates the Program File test.

   The next test selection screen is displayed.



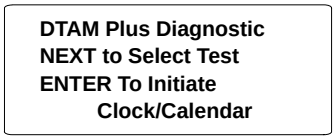
4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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Clock/Calendar Test

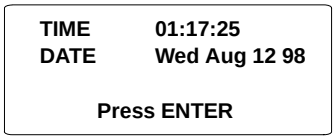
Use the Clock/Calendar test to test the realtime clock in the DTAM Plus. This test is valid only for terminals with a realtime clock.

1. Use the [NEXT] or [PREV] keys to display Clock/Calendar test on the test selection screen.



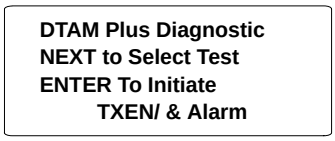
2. Press [↵] to initiate the test.

   The screen displays the current time and date.



3. Pressing [↵] terminates the Clock/Calendar test.

   The next test selection screen is displayed.



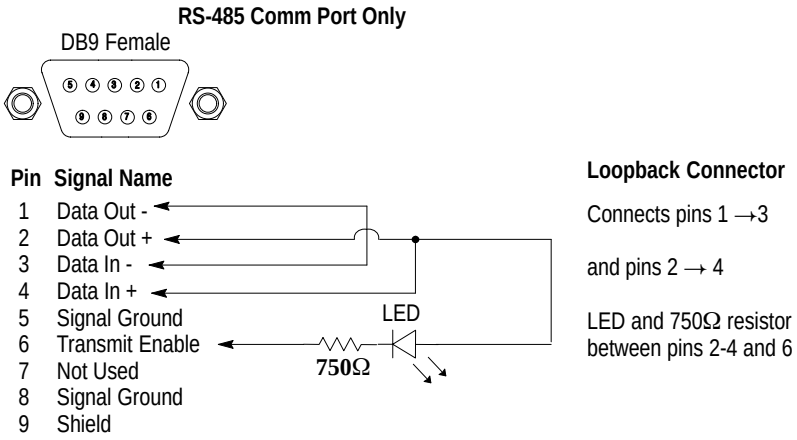
4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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TXEN Test

Only available on the RS-485 Comm port version. Use the TXEN test to verify the transmit enable line at the RS-485 communications port.

The TXEN test requires a loopback connector with an LED. You can construct a simple loopback connector as shown below:



To test the transmit enable line:

1. Use the [NEXT] or [PREV] keys to display TXEN/ & Alarm Test on the test selection screen.

   DTAM Plus Diagnostic
   NEXT to Select Test
   ENTER To Initiate
   TXEN/ & Alarm

2. Press [↵] to initiate the test.

   The following screen appears.

   Toggling TXEN Line
   A stable Alarm LED

   Press ENTER

   The Alarm LED flashes at approximately 1 second intervals indicating that the transmit enable line is functioning properly.

3. Pressing [↵] terminates the TXEN/ & Alarm test.

   The next test selection screen is displayed.

   DTAM Plus Diagnostic
   NEXT to Select Test
   ENTER To Initiate
   Reset DUT

4. To terminate the test function , press the [NEXT] or [PREV] keys to display **Reset DUT** in the test selection area. Press [↵] to reset the DTAM Plus.

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Cleaning the Display Window

To clean the display window:



ATTENTION: Use of abrasive cleansers or solvents may damage the window. Do not scrub or use brushes. Some types of paper towels may scratch the window, only use a soft sponge or cloth.

1. Disconnect power from the DTAM Plus at the power source.
2. Using a clean sponge or a soft cloth, clean the display with a mild soap or detergent.
3. Dry the display with a chamois or moist cellulose sponge to avoid water spots.

Removing Paint and Grease

Remove fresh paint splashes and grease before drying by rubbing lightly with isopropyl alcohol. Afterward, provide a final wash using a mild soap or detergent solution. Rinse with clean water.

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Appendix A

Specifications

DTAM Plus Specifications

Display

Column and Character	4 lines x 20 characters
Display Technology	
LCD (2707-L versions)	Twisted-nematic type with adjustable LED (yellow) backlighting
VFD (2707-V versions)	Vacuum Fluorescent Display with viewing distance that exceeds 25 feet (7.6 meters)
Backlight Settings for LCD Version (via Keypad)	Four (0,33,66 and 100%)
Contrast Ratio	10:1
Contrast/Brightness Settings (Keypad)	
LCD (2707-L versions)	4 settings
VFD (2707-V versions)	2 settings
Display Size (H x W)	
LCD (2707-L versions)	1.0 x 3.0 in (25.2 x 76.0 mm)
VFD (2707-V versions)	1.3 x 3.9 in (33.0 x 99.0 mm)
Character Size (H x W)	0.19 x 0.12 in (4.75 x 2.95 mm)

Keypad

Keypad Type	Embossed, sealed membrane
Tactile Feedback	Stainless steel dome
Operation Force	12 oz. ± 3 oz. (340 grams ± 85 grams)
Operational Life	1 million cycles

Electrical

Comm Port	RS-485 or RS-232C (configurable)
Printer Port (40K memory units)	RS-232C
Serial Communication Distances	
RS-485	4,000 ft (1219 meters) maximum with the Link Coupler (Catalog No. 1747-AIC)
RS-232C	50 ft (15 meters) maximum
RS-422	200 ft (61 meters) maximum to a PLC-5
Remote I/O Communication Distances	
57.6K	10,000 ft (2800 meters) maximum
115.2K	5,000 ft (1400 meters) maximum
230.4K	2,500 ft (700 meters) maximum

Voltage, Current, Fusing Requirements

Power Supply	Voltage	Current	Fuse
P1	15 - 23V AC, 47 - 440 Hz or 20 - 30V DC	800 mA max.	1 amp
P2	85 - 265V AC, 47 - 440 Hz or 110 - 300V DC	300 mA max.	1/2 amp

Port Isolation	
Communication Port	500V isolation
Printer Port	500V isolation

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Environmental

Ambient Temperature Rating	
Operating	
LCD Display	0 to +45° C (32 to 113° F)
VFD Display	0 to +60° C (32 to 140° F)
Storage	-20 to +85° C (-4 to 185° F)
Relative Humidity	5 to 95%, noncondensing

Mechanical

Dimensions (Approximate)	
Height:	7.6 inch (193.0 mm)
Width:	5.5 inch (139.7 mm)
Depth:	
RS-232 / RS 485 Versions	1.8 inch (45.7 mm)
Remote I/O Versions	2.35 inch (59.7 mm)
Front Panel Size:	
Height:	8.5 inch (215.9 mm)
Width:	6.5 inch (165.1 mm)
Weight	
All except 2707-V40P2N, -V40P2NR	2.1 lbs (0.95 kg)
2707-V40P2N, -V40P2NR	4.6 lbs (2.09 kg)
LED Indicators	
RUN LED	Green
Alarm LED	Red
Function LED	Yellow

Agency Ratings

NEMA Type 4, 12, 13 (indoor use only)
NEMA Type 4x (2707-V40P2N, 2707-V40P2NR only)

Class 1 Division 2 Groups A, B, C, D, hazardous locations①

Class 1 Division 2 Groups A, B, C, D, hazardous locations①

CE①

① Series B or higher – Cat. Nos. 2707–L8P1R, –L8P2R, –L40P1R, –L40P2R, –V40P1R, –V40P2R, –V40P2NR
Series C or higher – Cat. Nos. 2707–L8P1, –L8P2, L40P1, –L40P2, –V40P1, –V40P2, –V40P2N
Series D Only – Cat. Nos. 2707–L8P1, –L40P1, –V40P1

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European Union Directive Compliance

If this product is installed within the European Union or EFTA regions, the following regulations apply.

This apparatus is tested to meet Council Directive 89/336 Electromagnetic Compatibility (EMC) Standards:

- EN50081–2 Class A (Industrial) Emissions
- EN50082–2 Class A (Industrial) Immunity
- EN61000–6–2 Class A (Industrial) Immunity (Series D Only)

According to these Standards, the factor which determines, for EMC pruposes, whether an apparatus is deemed to be “Industrial” or “Residential, commercial and light industrial”, is given in Clause 1 of EN50081–2 as follows:

> Apparatus covered by this standard is not intended for connection to a public mains network, but is intended to be connected to a power network supplied from a high– or medium–voltage transformer dedicated for the supply of an installation feeding a manufacturing or similar plant.

The product described in this document is intended solely for use in an industrial environment as defined above. When installed in Europe, any other application is in contravention of the European Union Directives, and a breach of those laws.

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Appendix A
Specifications

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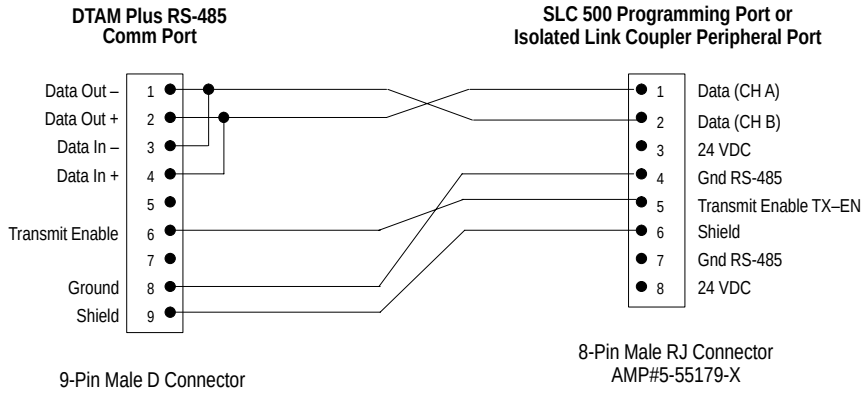
Appendix B

DTAM Plus Cable Diagrams

DTAM Plus Cables

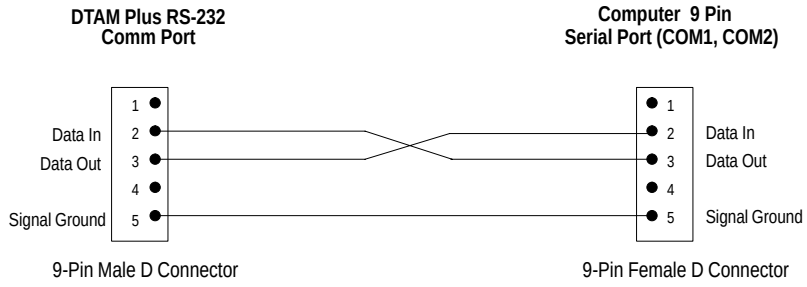
Catalog No. 2707-NC1

Use the DH-485 Network Interface Cable to connect the RS-232/RS-485 versions of the DTAM Plus to an SLC DH-485 network.



Catalog No. 2707-NC2

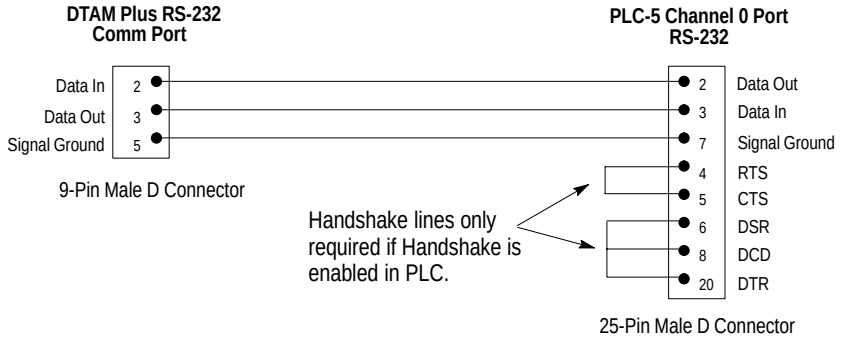
Use the Upload/Download Cable to connect the RS-232/RS-485 versions of the DTAM Plus to a personal computer for transferring applications. A 25 to 9 pin adapter is required if your computer has a 25 pin communication port.



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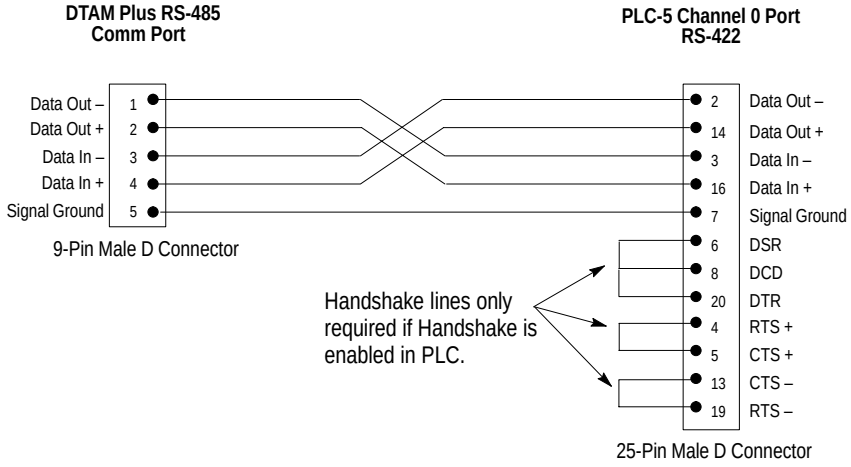
Catalog No. 2707-NC3

Use the RS-232 Communications Cable to connect the RS-232/RS-485 versions of the DTAM Plus to Channel 0 (configured as RS-232) of a PLC-5.



Catalog No. 2707-NC4

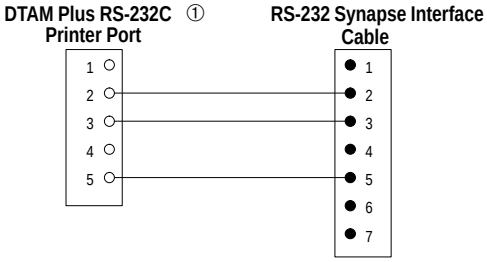
Use the RS-422 Communications Cable to connect the RS-485 Comm port of the DTAM Plus to Channel 0 (configured as RS-422) of a PLC-5. The DTAM Plus RS-485 port is compatible with the PLC-5 RS-422 standard.



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Catalog No. 2707-NC6

Use the ASCII Input cable to connect an ASCII device to the DTAM Plus printer port. Use this cable with decoded bar code scanners.



○ = Female Connector
● = Male Connector

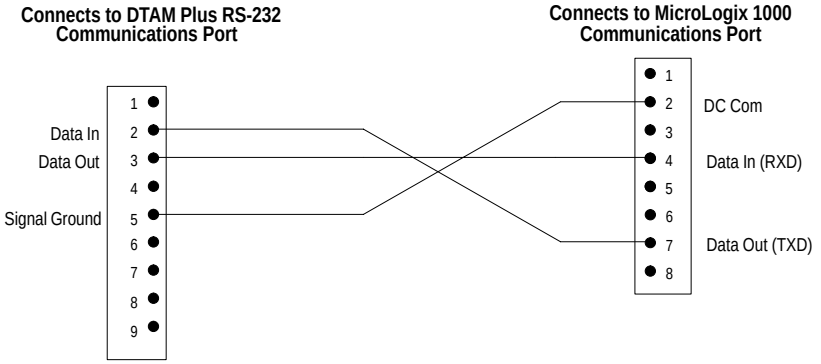
DTAM Plus RS-232C 9 Pin	RS-232C 9-Pin
2 = Data In	2 = Data Out
3 = Data Out	3 = Data In
5 = Signal Ground	5 = Signal Ground

①The communications port of the DTAM Plus must be set to RS-232.

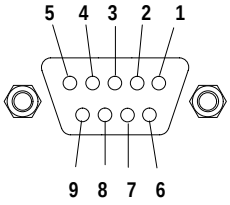
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Catalog No. 2707-NC10

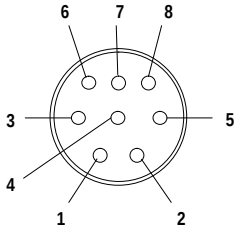
Use the RS-232 Communications cable (Catalog No. 2707-NC10) to connect the DTAM Plus to the MicroLogix 1000 for run-time operation. The length of this cable is 2 meters.



9-Pin Male D Connector



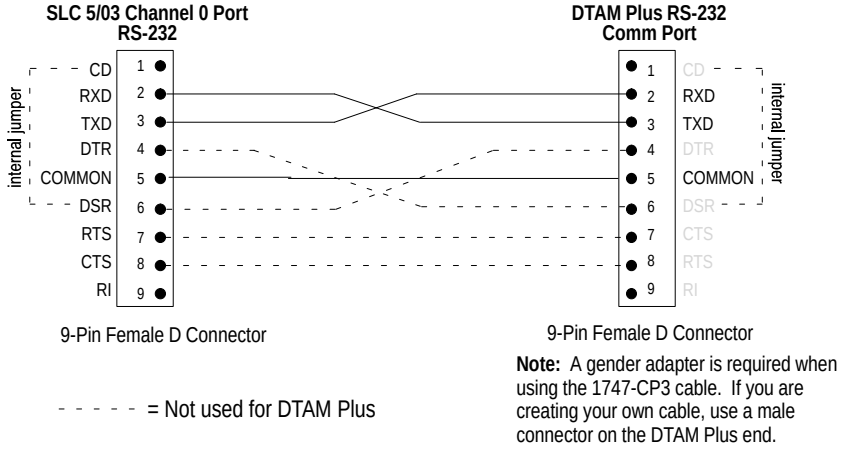
8-Pin Male C DIN Right Angle Connector



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Catalog No. 1747-CP3

Use this RS-232 Communications Cable to connect the RS-232 Comm port of the DTAM Plus to Channel 0 of an SLC 5/03, 5/04. A 9 pin male to female gender adapter is required when using this cable. If you are making your own cable, use a 9 pin male connector on the DTAM Plus end instead of the 9 pin female connector (with 90° bend allowing closure of the SLC door) shown below. In addition, the control lines are not needed.



9-Pin Female D Connector

9-Pin Female D Connector

- - - - - - = Not used for DTAM Plus

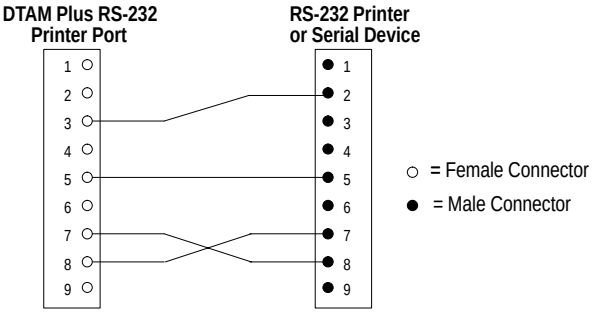
Note: A gender adapter is required when using the 1747-CP3 cable. If you are creating your own cable, use a male connector on the DTAM Plus end.

The control lines (pins #1, #4, #6, #7, and #8) are not used by the DTAM Plus. The connections to these pins can be deleted for this application.

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DTAM Plus RS-232 Printer Port Cable

Create the following cable for the optional printer port of the DTAM Plus. Use this port to send data to a printer or serial device such as a large display.



DTAM Plus RS-232 9 Pin	RS-232 9 Pin	or	RS-232 25 Pin ①
3 = Data Out	2 = Data In		3 = Data In
5 = Signal Ground	5 = Signal Ground		4 = Request to Send
7 = Request to Send	7 = Request to Send		5 = Clear to Send
8 = Clear to Send	8 = Clear to Send		7 = Signal Ground

① Use this pinout if printer or serial device has a 25 pin connector.

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Appendix C

Special Controller Functions

Objectives

This appendix describes the Special Menu used to access to special features for controller operations.

Section	Page
Accessing Special Functions	C–2
Using the P-A/D Function	C–3
Reading Controller Input and Output Files	C–4
Reading / Writing Controller Status Files	C–5
Reading / Writing Controller Bit and Integer Files	C–6
Reading / Writing Controller Timer Files	C–7
Reading / Writing Controller Counter Files	C–8
Reading / Writing Controller Control Files	C–9
Reading / Writing Floating Point Files	C–10
Reading / Writing Controller ASCII Files	C–11
Reading / Writing Controller BCD Files	C–12
Reading / Writing Controller Block Transfer Files	C–13
Reading / Writing Controller Message Files	C–14
Reading / Writing PID Files	C–15
Reading / Writing SFC Files	C–16
Reading Controller ASCII String Files	C–17
Using the Mode Function	C–19
Using the Memory Transfer Function	C–20
Using the Clear Fault Function	C–21

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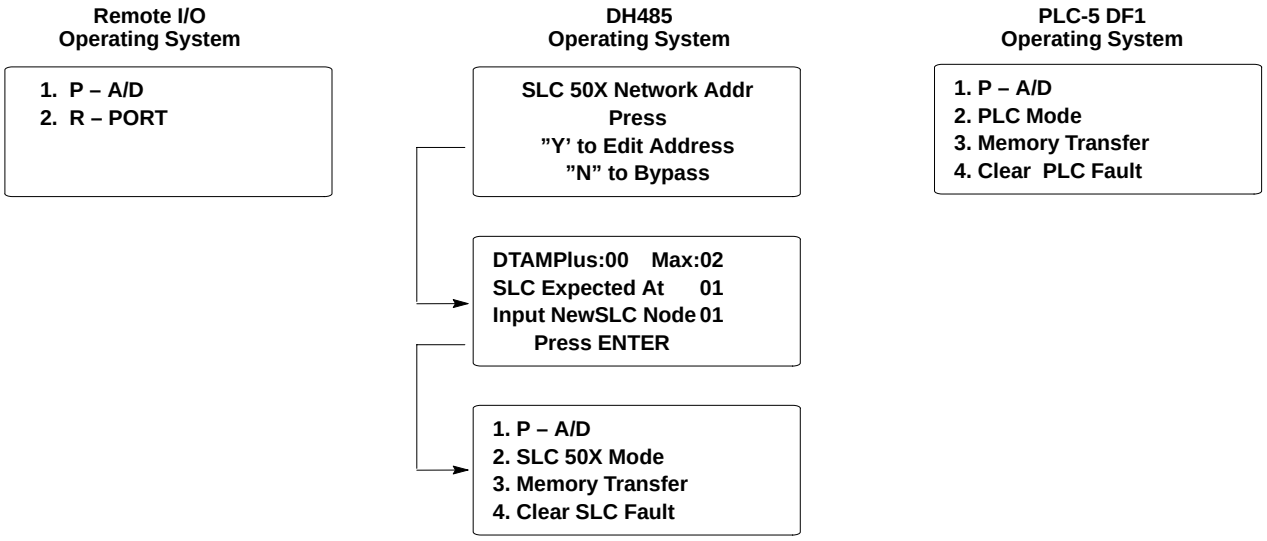
Accessing Special Functions

To access the Special Functions Menu:

1. Select item 5 from the Function Menu to access the Special Menu:

```
1 C-Port        5 Special
2 P-Port        6 Term
3 Clk/Cal       7 Test
4 Reset         8 Other
```

You are prompted:



2. The special functions you can select depends upon the the operating system.

The Special Menu provides access to one or more of these functions:

1 P-A/D refer to page C–3 for more information.

2 Mode (DH485 or PLC-5 DF1) refer to page C–19 for more information.

2 R Port (Remote I/O) refer to Chapter 3 for more information.

3 Mem Xfer refer to page C–20 for more information.

4 Clr Fault refer to page C–21 for more information.

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Using the P-A/D Function

Use the P-A/D function to display and change values in controller files. The only exceptions are Input and Output files, you cannot write to these file types. The P-A/D function is often useful when starting up or debugging applications. The following tables list the controller file types that can be accessed using the P-A/D function:

SLC File Types

File Type	Identifier	Default File Number	Read	Write
Output	O	0	Yes	No
Input	I	1	Yes	No
Status	S	2	Yes	Yes
Binary	B	3	Yes	Yes
Timer	T	4	Yes	Yes
Counter	C	5	Yes	Yes
Control	R	6	Yes	Yes
Integer	N	7	Yes	Yes
ASCII①	A	None	Yes	No
ASCII String①	ST	None	Yes	No
Floating Point①	F	None	Yes	Yes

① Not supported by SLC 5/01 or 5/02 controllers.

PLC File Types

File Type	Identifier	Default File Number	Read	Write
Output	O	0 (fixed)	Yes	No
Input	I	1 (fixed)	Yes	No
Status	S	2 (fixed)	Yes	Yes
Binary	B	3	Yes	Yes
Timer	T	4	Yes	Yes
Counter	C	5	Yes	Yes
Control	R	6	Yes	Yes
Integer	N	7	Yes	Yes
Floating Point	F	8	Yes	Yes
ASCII	A	9	Yes	Yes
BCD	D	10	Yes	Yes
Block Transfer	BTR or BTW	11	Yes	Yes
Message	MG	12	Yes	No
PID	PD	13	Yes	Yes
SFC	SC	14	Yes	Yes
ASCII String	ST	15	Yes	No

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Reading Controller Input and Output Files

To read the contents of controller Input and Output files:

1. Enter the P–A/D function from the Special Menu.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select either (I)Input or (O)Output and press [↵].

   You are prompted:

Remote I/O Operating System

```
(0) Output

Element Addr:  0
```

DH485 Operating System

```
Select File Number
0
Press ENTER
```

↓

```
File Number
0
Word Address: 0
```

PLC-5 DF1 Operating System

```
File Number:  0

Element Addr:  0
```

3. Enter the Element Address (PLC) or the File Number and Word Address (SLC) If you are accessing PLC data, you must enter an octal value.

   You are shown the value at that address:

Remote I/O Operating System

```
File:Elem   DEC    HEX
O :000      00000  0000
15 ....  Binary  ...      0
0000  0000  0000  0000
```

DH485, PLC-5 DF1 Operating Systems

```
File:Elem   DEC    HEX
O001:000    00000  0000
15 ....  Binary  ...      0
0000  0000  0000  0000
```

4. Press the [NEXT] key to enter a new element address. Press [↵] to display the contents at the new address.

5. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller Status Files

To read/write the contents of controller Status files:

ATTENTION: Changing control status bits may cause a processor fault or have other possible effects on the controller operation. Make sure you understand the function of status data.

1. Enter the P–A/D function from the Special Menu.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (S)Status and press [↵].

   You are prompted for a status file number:

   DH485 Operating System

   ```
   Select File Number
   2
   Press ENTER
   ```

   ↓

   ```
   File Number
   2
   Word Address:  0
   ```

   PLC-5 DF1 Operating System

   ```
   File Number:  2

   Element Addr:  0
   ```

3. Enter the status file number and word or element address.

   You are shown the value at that address:

   DH485 Operating System

   ```
   File:Word   DEC     HEX
   S002:000    00000   0000
   15 ....  Binary  ...    0
   0000  0000  0000  0000
   ```

   PLC-5 DF1 Operating System

   ```
   File:Elem   DEC     HEX
   S002:000    00000   0000
   15 ....  Binary  ...    0
   0000  0000  0000  0000
   ```

4. To change a value or the element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data. If you are editing binary data, use the [+/-] key to toggle the data between 1 and 0 and press [NEXT] or [PREV] to move to the next bit.
   See **Attention** above.

5. Press [↵] to to load the new data into the file element.

6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller Bit and Integer Files

To read/write the contents of controller Bit and Integer files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select either (B)Bit or (N)Integer and press [↵].

   You are prompted for a bit or integer file number:

   DH485 Operating System

   ```
   Select File Number
   3
   Press ENTER
   ```

   ↓

   ```
   File Number
   3
   Word Address:  0
   ```

   PLC-5 DF1 Operating System

   ```
   Select File Number
   3
   Press ENTER
   ```

   ↓

   ```
   File Number:
   3
   Element Addr:  0
   ```

3. Enter the bit or integer file number and word or element address.

   You are shown the value at that address:

   DH485 Operating System

   ```
   File:Word   DEC     HEX
   B003:000    00000   0000
   MSB BINARY .LSB=0000
   0000  0000  0000  0000
   ```

   PLC-5 DF1 Operating System

   ```
   File:Elem   DEC     HEX
   B003:000    00000   0000
   15 ....  Binary  ...    0
   0000  0000  0000  0000
   ```

4. To change a value or the element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data. If you are editing binary data, use the [+/-] key to toggle the data between 1 and 0 and press [NEXT] or [PREV] to move to the next bit.
5. Press [↵] to to load the new data into the file.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller Timer Files

To read/write the contents of controller Timer files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (T)Timer and press [↵].

   You are prompted for a timer file number:

   DH485 Operating System

   ```
   Select File Number
   4
   Press ENTER
   ```

   ↓

   ```
   File Number
   4
   Word Address:  0
   ```

   PLC-5 DF1 Operating System

   ```
   Select File Number
   4
   Press ENTER
   ```

   ↓

   ```
   File Number:
   4
   Element Addr:  0
   ```

3. Enter the timer file number and word or element address.

   You are shown the timer data:

   ```
   T004:000   Acc 00000
              Pre 00000
     EN    TT    DN
     0     0     0
   ```

   Bits (Enable, Timer Timing, Done)

4. To change the Acc and Pre values or element address, move the cursor to the data field using the [PREV] or [NEXT] keys. Enter the new data.

ATTENTION: Do not send negative timer values to the controller. Negative timer values can cause a controller fault.

---

5. Press the [↵] key to enter new accumulator or preset values to the displayed timer address.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller Counter Files

To read/write the contents of controller Counter files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (C) Counter and press [↵].

   You are prompted for a counter file number:

   DH485 Operating System

   ```
   Select File Number
   5
   Press ENTER
   ```

   ↓

   ```
   File Number
   5
   Word Address:  0
   ```

   PLC-5 DF1 Operating System

   ```
   Select File Number
   5
   Press ENTER
   ```

   ↓

   ```
   File Number:
   5
   Element Addr:  0
   ```

3. Enter the counter file number and word or element address.

   You are shown the value at that address:

   ```
   C005:000  Acc 00000
             Pre 00000
   CU  Cd  DN  OV  UN
   0   0   0   0   0
   ```

   Bits (Count Up Enable, Count Down Enable Done Overflow Underflow)

4. To change the Acc and Pre values or element address, move the cursor to the data field using the [PREV] or [NEXT] keys. Enter the new data.
5. Press the [↵] key to enter new accumulator or preset values to the displayed counter address.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller Control Files

To read/write the contents of controller Control files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

```
Select file type:
(O)Output
PREV/NEXT To Scroll
ENTER To Select
```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (R)Control and press [↵].

   You are prompted for a control file number:

DH485 Operating System

```
Select File Number
6
Press ENTER
```

```
File Number
6
Word Address:  0
```

PLC-5 DF1 Operating System

```
Select File Number
6
Press ENTER
```

```
File Number:
6
Element Addr:  0
```

3. Enter the control file number and word or element address.

   You are shown the value at that address:

DH485 Operating System

```
R006:000    Len 00000
            Pos 00000
EN  DN  ER  UI  IN
0   0   0   0   0
```

Bits (Enable Done Error Unload Inhibit)

PLC-5 DF1 Operating System

```
R006:000    Len 00000
            Pos 00000
EnEu DnEm ERUl InFd
0 0  0 0  0 0  0 0
```

Bits (Enable, Enable Unload Done, Empty Error, Unload Inhibit, Found)

4. To change the Len and Pos values or element address, move the cursor to the data field using the [PREV] or [NEXT] keys. Enter the new data.
5. Press the [↵] key to enter new length or position values to the displayed control address.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Floating Point Files

To read the contents of Floating Point files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (F)Float and press [↵].

   You are prompted for a floating point file number:

   ```
   PLC-5 DF1, DH-485
   Operating Systems

   Select File Number
   8
   Press ENTER
   ```

   ↓

   ```
   File Number:
   8
   Element Addr:  0
   ```

3. Enter the floating point file number and word or element address.

   You are shown the value at that address:

   ```
   File:Elem:
   F008:000
         Float
                  0.
   ```

4. To change the floating point value or element address, move the cursor to the data field using the [PREV] or [NEXT] keys. Enter the new data.
5. Press the [↵] key to enter new length or position values to the displayed floating point address.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller ASCII Files

To read the contents of ASCII files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (A)ASCII and press [↵].

   You are prompted for an ASCII file number:

   ```
   PLC-5 DF1, DH485
   Operating Systems

   Select File Number
   9
   Press ENTER

   File Number:
   9
   Element Addr: 0
   ```

3. Enter the ASCII file number and word or element address.

   You are shown the value at that address:

   ```
   File:Elem          ASCII
   A003:000           ,00, 00
   15 ....  Binary  ...    0
   0000  0000  0000  0000
   ```

4. To change a value or the element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data. If you are editing binary data, use the [+/-] key to toggle the data between 1 and 0 and press [NEXT] or [PREV] to move to the next bit.
5. Press [↵] to to load the new data into the file.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller BCD Files

To read/write the contents of controller BCD files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (D)BCD and press [↵].

   You are prompted for a BCD file number:

   ```
   PLC-5 DF1
   Operating System

   Select File Number
   10
   Press ENTER

   File Number:
   10
   Element Addr:  0
   ```

3. Enter the BCD file number and word or element address.

   You are shown the value at that address:

   ```
   File:Elem   DEC     BCD
   B003:000    00000   0000
   15 ....  Binary  ...     0
   0000  0000  0000  0000
   ```

4. To change a value or the element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data. If you are editing binary data, use the [+/-] key to toggle the data between 1 and 0 and press [NEXT] or [PREV] to move to the next bit.
5. Press [↵] to to load the new data into the file.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller Block Transfer Files

To read/write the contents of PLC controller Block Transfer Read or Write files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

```
Select file type:
(O)Output
PREV/NEXT To Scroll
ENTER To Select
```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (BT, BTR, or BTW) Block Xfer and press [↵].

   You are prompted for a block transfer file number:

Remote I/O Operating System

```
(BTR)Block Transfer Read

Element Addr:  0
```

PLC-5 DF1 Operating System

```
Select File Number
11
Press ENTER
```

```
File Number:
11
Element Addr:  0
```

```
File Number:
11
Element Addr:  0
Sub-Element Addr:  0
```

3. Enter the block transfer file number and word or element / sub-element address.

   You are shown the value at that address:

Remote I/O Operating System

```
File:Elem:  DEC     Hex
BTR  :000   00 000  0000
15 ....  Binary  ...      0
0000  0000  0000  0000
```

PLC-5 DF1 Operating System

```
File:Elem:  SElem  DEC
BT011:000:00       00 000
15 ....  Binary  ...      0
0000  0000  0000  0000
```

4. To change a value, element, or sub-element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data. If you are editing binary data, use the [+/-] key to toggle the data between 1 and 0 and press [NEXT] or [PREV] to move to the next bit.
5. Press [↵] to to load the new data into the file.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing Controller Message Files

To read the contents of PLC message files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (MG)Message and press [↵].

   You are prompted for a message file number:

   PLC-5 DF1
   Operating System

   ```
   Select File Number
   12
   Press ENTER
   ```

   ↓

   ```
   File Number:
   12
   Element Addr:  0
   ```

   ↓

   ```
   File Number:
   12
   Element Addr:  0
   Sub–Element Addr:  0
   ```

3. Enter the message file number and word or element / sub-element address.

   You are shown the value at that address:

   ```
   File:Elem:  SElem  DEC
   MG012:000:00       0000
   15 ....  Binary  ...      0
   0000   0000   0000   0000
   ```

4. To change a value, element, or sub-element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data. If you are editing binary data, use the [+/-] key to toggle the data between 1 and 0 and press [NEXT] or [PREV] to move to the next bit.

5. Press [↵] to to load the new data into the file.

6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing PID Files

To read the contents of PLC PID files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (PD)PID and press [↵].

   You are prompted for a PID file number:

   ```
   PLC-5 DF1
   Operating System

   Select File Number
   13
   Press ENTER

   File Number:
   13
   Element Addr:  0

   File Number:
   13
   Element Addr:  0
   Sub–Element Addr:  0
   ```

3. Enter the PID file number and word or element / sub-element address.

   You are shown the value at that address:

   ```
   File:Elem:  SElem  DEC
   PD013:000:00       00000
   15 ....  Binary  ...     0
   0000  0000  0000  0000
   ```

4. To change a value, element, or sub-element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data. If you are editing binary data, use the [+/-] key to toggle the data between 1 and 0 and press [NEXT] or [PREV] to move to the next bit.

5. Press [↵] to to load the new data into the file.

6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Reading / Writing SFC Files

To read the contents of PLC SFC files:

1. Select item 1 from the Special Menu to access the P–A/D function.

   You are prompted for a file type:

   ```
   Select file type:
   (O)Output
   PREV/NEXT To Scroll
   ENTER To Select
   ```

2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (MG)Message and press [↵].

   You are prompted for an SFC file number:

   ```
   PLC-5 DF1
   Operating System

   Select File Number
   14
   Press ENTER

          ↓

   File Number:
   14
   Element Addr: 0
   ```

3. Enter the SFC file number and word or element address.

   You are shown the value at that address:

   ```
   SC014:000      Pre00000
                  Tim 00000
   SA  FS  LS  OV  ER  DN
   0   0   0   0   0   0
   ```

4. To change a value or element address, move the cursor into the data field using the [PREV] and [NEXT] keys. Enter the new data.
5. Press [↵] to to load the new data into the file.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

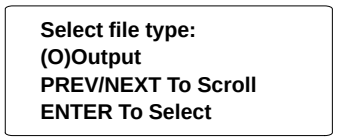
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Reading Controller ASCII String Files

To read the contents of PLC ASCII string files:

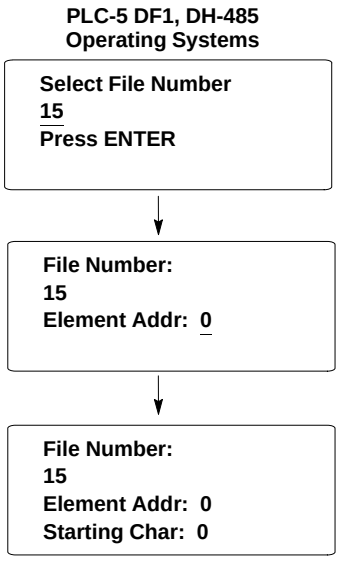
1. Select item 1 from the Special Menu to access the P-A/D function.

   You are prompted for a file type:



2. Press [NEXT] and [PREV] keys to scroll through the file types. Select (ST)ASCII Str and press [↵].

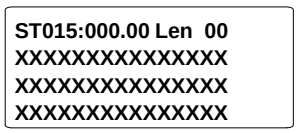
   You are prompted for a message file number:



3. Enter the ASCII string file number, word or element address and the starting (1 to 81). The starting character specifies the first character in the string to be displayed followed by the remaining characters (up to the 82nd character).

   Note: In order to maintain boundary addressing, only odd starting characters are allowed. If an even value is entered the DTAM Plus will change the value down to the next lower odd number.

   You are shown the value beginning at the starting character:



   The Len field displays the string length in a decimal format. Up to 60 characters of the string are displayed on lines 2, 3, and 4. Strings longer than 60 characters are truncated.

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4. To change an element address, move the cursor into the data field using the [NEXT] or [PREV] keys. Enter the new data.
5. Press [↵] to to display the data at the new address.
6. Pressing the [PREV MENU] key at any time returns to the P–A/D file select menu.

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Using the Mode Function

Use the Mode function to change the controller operating mode (Run or Program) from the DTAM Plus. The mode function displays for an SLC and PLC operating system are different. Both are shown below:

SLC Controllers

1. Select item 2 from the Special Menu to access the Mode function.

   You are prompted for an operating mode:

   ```
   SLC 50X Mode
   Press
   "Y" to RUN
   "N" to PROGRAM
   ```

2. Press [Y] to place the controller in Run mode or [N] to enter the Program mode.

   You are returned to the Main Menu.

PLC Controllers

1. Select item 2 from the Special Menu to access the Mode function.

   The PLC must be in Remote Program mode or you will be prompted:

   ```
   PLC not in Remote mode
   Press "Y" to continue
   ```

2. Depending upon the current PLC mode, you are prompted to change the controller mode:

   If the controller is in Run mode:

   ```
   PLC is in Run Mode
   Y=Prog    N=Abort
   ```

   If the controller is in Program mode;

   ```
   PLC is in PROG Mode
   Y=RUN    N=Abort
   ```

3. Press [Y] or [N] to enter your selection.

   You are returned to the Main Menu.

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Using the Memory Transfer Function

The Memory Transfer function allows the DTAM Plus to initiate a memory transfer between a controller memory module and the controller.

- Memory transfers with an SLC are bidirectional. Data can be transferred to and from the memory module.
- PLC transfers are only from the PLC to the memory module.

SLC Controllers

1. Select item 3 from the Special Menu to access the Mem Xfer function.

   You are prompted for a transfer direction:

   ```
   Memory Transfer
   Press
   "Y" SLC → MEM Pack
   "N" MEM PAC → SLC
   ```

2. Place the memory module into the SLC. The SLC must be in the program mode.
3. Press [Y] to transfer data (ladder program and data files) from the SLC to the memory module.
   Press [N] to transfer data from the memory module to the SLC.

   You are returned to the Main Menu.

PLC Controllers

1. Select item 2 from the Special Menu to access the Mem Xfer function.

   The PLC must be in Program or Remote Program mode or you will be prompted:

   ```
   Not in Program
   or RemoteMode
   Press "Y" to continue
   ```

   You are prompted to continue the operation:

   ```
   Press "Y" to transfer
   from PLC memory
   to the module
   ```

2. Place the memory module into the PLC.
3. Press [Y] to transfer data from the PLC to the memory module.
   Press [N] to abort the operation.

   The DTAM Plus will display either:

   ```
   EEPROM
   Successfully Burned
   Press "Y" to continue
   ```

   ```
   ERROR
   EEPROM NOT BURNED
   Press "Y" to continue
   ```


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Using the Clear Fault Function

Use the Clear Fault function to clear all major and minor faults in the logic controller.

To clear controller faults:

1. If you are clearing a PLC, the controller must be in Program or Remote Program mode.
2. Select item 4 from the Special Menu to access the Clear Fault function.

   You are prompted to clear faults:

SLC Controllers

```
Clear SLC Fault
Press "Y"To Clear
All SLC 50X Faults
Press "N" To Exit
```

PLC Controllers

```
Press "Y"To Clear
All PLC 5 Faults
Press "N" To Exit
```

3. Press [Y] to clear the faults or [N] to abort the function.

   The faults are cleared and you are returned to the special functions menu:

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Appendix D

Terminal Mode

ASCII Transmission Characters

When using the DTAM Plus in terminal mode, the keypad is mapped to the characters shown in the following table.

DTAM Plus Key	ASCII	HEX	Decimal
Main Menu	85	133
Prev Menu	84	132
Prev	82	130
Next	80	128
*F	86	134
*Contrast (Half Ball)	83	131
*Backlight (Sun)	81	129
Y	Y	59	89
N	N	4E	78
Back Space	<BS>	8	8
EXP	E	45	69
CE	<FF>	0C	12
+/–	+/–	2B/2D	43/45
(.)	.	2E	46
Enter (↵)	<CR>	D	13
9	9	39	57
8	8	38	56
7	7	37	55
6	6	36	54
5	5	35	53
4	4	34	52
3	3	33	51
2	2	32	50
1	1	31	49
0	0	30	48

* These keys will not transmit a code if DIP Switch SW1–5 is enabled. They will operate in their normal mode until SW1–5 is disabled. Once SW1–5 is disabled the list codes will be transmitted.

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ASCII Display Characters

The following charts show the ASCII display characters and their corresponding hexadecimal codes.

Table D.1
Terminal Mode – Supported Display Character Set*

DEC	HEX	CHR
32	20	
33	21	!
34	22	"
35	23	#
36	24	$
37	25	%
38	26	&
39	27	'
40	28	(
41	29	)
42	2A	*
43	2B	+
44	2C	,
45	2D	-
46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7

DEC	HEX	CHR
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O

DEC	HEX	CHR
80	50	P
81	51	Q
82	52	R
83	53	S
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	¥
93	5D	]
94	5E	^
95	5F	_
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e
102	66	f
103	67	g

* All of the above characters are supported when 8 data bit communication is enabled. Hex codes below 80H are supported by 7 data bit communication.

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D.1
Terminal Mode – Supported Display Character Set*

DEC	HEX	CHR
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	71	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C	|
125	7D	}
126	7E	→
127	7F	←

DEC	HEX	CHR
160	A0	
161	A1	｡
162	A2	｢
163	A3	｣
164	A4	､
165	A5	･
166	A6	ヲ
167	A7	ァ
168	A8	ィ
169	A9	ゥ
170	AA	ェ
171	AB	ォ
172	AC	ャ
173	AD	ュ
174	AE	ョ
175	AF	ッ
176	B0	ー
177	B1	ア
178	B2	イ
179	B3	ウ
180	B4	エ
181	B5	オ
182	B6	カ
183	B7	キ

DEC	HEX	CHR
184	B8	ク
185	B9	ケ
186	BA	コ
187	BB	サ
188	BC	シ
189	BD	ス
190	BE	セ
191	BF	ソ
192	C0	タ
193	C1	チ
194	C2	ツ
195	C3	テ
196	C4	ト
197	C5	ナ
198	C6	ニ
199	C7	ヌ
200	C8	ネ
201	C9	ノ
202	CA	ハ
203	CB	ヒ
204	CC	フ
205	CD	ヘ
206	CE	ホ
207	CF	マ

* All of the above characters are supported when 8 data bit communication is enabled. Hex codes below 80H are supported by 7 data bit communication.

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D.1
Terminal Mode – Supported Display Character Set*

DEC	HEX	CHR
208	D0	
209	D1	
210	D2	
211	D3	
212	D4	
213	D5	
214	D6	
215	D7	
216	D8	
217	D9	
218	DA	
219	DB	
220	DC	
221	DD	
222	DE	
223	DF	
224	E0	
225	E1	
226	E2	
227	E3	
228	E4	
229	E5	
230	E6	
231	E7	

DEC	HEX	CHR
232	E8	
233	E9	
234	EA	
235	EB	
236	EC	
237	ED	
238	EE	
239	EF	
240	F0	
241	F1	
242	F2	
243	F3	
244	F4	
245	F5	
246	F6	
247	F7	
248	F8	
249	F9	
250	FA	
251	FB	
252	FC	
253	FD	
254	FE	
255	FF	

* All of the above characters are supported when 8 data bit communication is enabled. Hex codes below 80H are supported by 7 data bit communication.

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Table D.2
Terminal Mode – Screen Control Codes

HEX	Function	Description
08	BS	Back Space
0A	LF	Line Feed
0C	FF	Blanks the screen, moves the cursor to the upper left corner of the display.
0D	CR	Moves the cursor to the extreme left position of the line.

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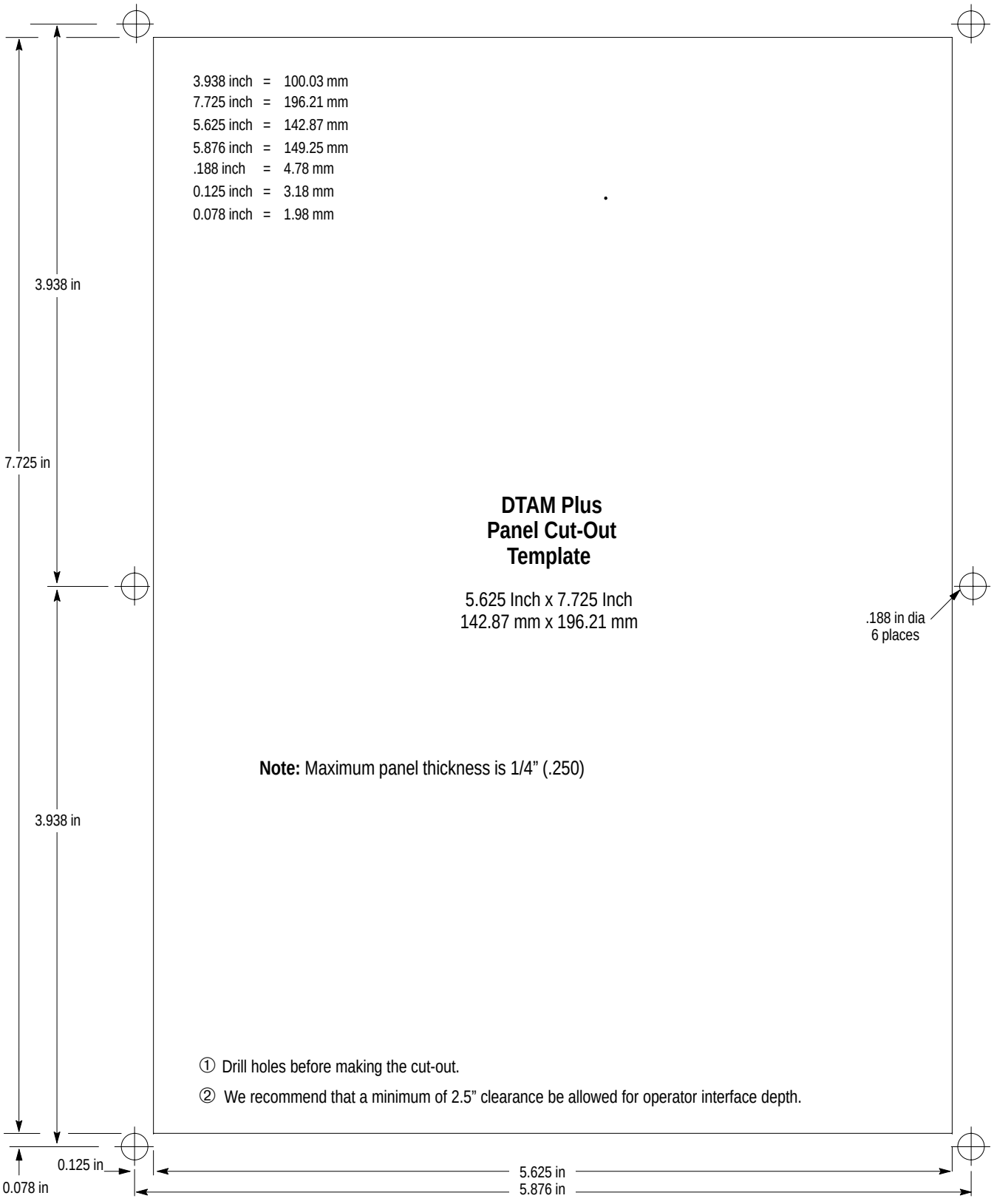
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Appendix E

DTAM Plus Mounting Template

Refer to the mounting template on the following page when installing the DTAM Plus.

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Getting Technical Assistance

If you need technical assistance, please review the information in Chapter 8, “Troubleshooting and Maintenance” before calling your local distributor of Spectrum Controls.

Note that your module contains electronic components which are susceptible to damage from electrostatic discharge (ESD). An electrostatic charge can accumulate on the surface of ordinary plastic wrapping or cushioning material. **In the unlikely event that the module should need to be returned to Spectrum Controls, please ensure that the unit is enclosed in approved ESD packaging (such as static-shielding / metallized bag or black conductive container)**. Spectrum Controls reserves the right to void the warranty on any unit that is improperly packaged for shipment.

For further information or assistance, please contact your local distributor, or call the Spectrum Controls technical Support at :

USA - 440-646-6900
United Kingdom - 01908 635230
Australia - 800-809-929 or (61) 398-990-335
Brazil - (55) 11 3618 8800
Europe - (49) 2104 960 333

Declaration of Conformity

Declaration available upon request.

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Corporate Headquarters
Spectrum Controls Inc.
P.O. Box 5533
Bellevue, WA 98006 USA
Fax: 425-641-9473
Tel: 425-746-9481
Web Site: www.spectrumcontrols.com
E-mail: spectrum@spectrumcontrols.com

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Owner's Guide 0100078-02 Rev. C

DTAM PLUS™ INSTALL INSTRUCTION

Catalog Numbers: -L40PxX, -V40PxX

This document describes how to install a DTAM Plus terminal and connect power.

- Wiring and Safety Guidelines
- Enclosures
- Equipment Required
- Clearances
- Mounting Dimensions
- Installation
- Wire and Cable Length Restrictions
- Connecting Power
- Powerup Sequence
- Upload/Download DIP Switch Settings
- Upload/Download Connections
- Connecting to Devices
- Specifications
- Agency Ratings
- European Union Directive Compliance

For more information on the DTAM Plus terminal, refer to the following publications.

DTAM Plus User Manual

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Important Notes

1. Please read all the information in this owner's guide before installing the product.
2. The information in this owner's guide applies to hardware version A and firmware version 1.0 or later.
3. This guide assumes that the reader has a full working knowledge of the relevant processor.

Notice

The products and services described in this owner's guide are useful in a wide variety of applications. Therefore, the user and others responsible for applying the products and services described herein are responsible for determining their acceptability for each application. While efforts have been made to provide accurate information within this owner's guide, Spectrum Controls assumes no responsibility for the accuracy, completeness, or usefulness of the information herein.

Under no circumstances will Spectrum Controls be responsible or liable for any damages or losses, including indirect or consequential damages or losses, arising out of either the use of any information within this owner's guide or the use of any product or service referenced herein.

No patent liability is assumed by Spectrum Controls with respect to the use of any of the information, products, circuits, programming, or services referenced herein.

The information in this owner's guide is subject to change without notice.

Limited Warranty

Spectrum Controls warrants that its products are free from defects in material and workmanship under normal use and service, as described in Spectrum Controls literature covering this product, for a period of 1 year. The obligations of Spectrum Controls under this warranty are limited to replacing or repairing, at its option, at its factory or facility, any product which shall, in the applicable period after shipment, be returned to the Spectrum Controls facility, transportation charges prepaid, and which after examination is determined, to the satisfaction of Spectrum Controls, to be thus defective.

This warranty shall not apply to any such equipment which shall have been repaired or altered except by Spectrum Controls or which shall have been subject to misuse, neglect, or accident. In no case shall the liability of Spectrum Controls exceed the purchase price. The aforementioned provisions do not extend the original warranty period of any product which has either been repaired or replaced by Spectrum Controls.

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Wiring Guidelines

Here are some recommendations on how to reduce electromagnetic noise on the communications connections:

- Careful wire routing helps reduce or minimize electrical noise. Route incoming power to the terminal by a separate path from the communications cables.
- Do not run communications wiring and power wiring in the same conduit.
- Where communications and power wiring must cross, make their intersection perpendicular.
- Proper grounding helps to reduce the effects of noise due to Electromagnetic Interference (EMI). To avoid problems caused by EMI, all cables must be shielded and grounded at one end. Grounding is also an important safety measure in electrical installations. A source for grounding recommendations is the National Electrical Code published by the National Fire protection Association of Boston Massachusetts.

Safety Guidelines

Install the DTAM Plus using publication NFPA 70E, Electrical Safety Requirements for Employee Workplaces as a guide.

Be certain to follow all directions for installing and connecting power to the DTAM Plus.

When used in a hazardous environment, the ultimate enclosure must be in accordance with Class 1, Division 2 wiring methods as described in the National Electrical Code (ANSI/NFPA 70) and the Canadian Electrical Code.

All peripheral equipment must be suitable for the location in which it is used.

For P1 powered units, use only a Class 2 power source as described in the National Electrical Code (ANSI/NFPA 70) and the Canadian Electrical Code.

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ATTENTION:
EXPLOSION HAZARD: SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.

RISQUE D'EXPLOSION: LA SUBSTITUTION DE COMPOSANTS PEUT RENDRE CE MATÉRIEL INACCEPTABLE POUR LES EMPLACEMENTS DE CLASSE 1, DIVISION 2.



ATTENTION: USE P1 POWERED UNITS ONLY WITH CLASS 2 POWER SOURCE LIMITED TO 30 VDC OPEN CIRCUIT AND 8A SHORT CIRCUIT.

ATTENTION: UTILISER AVEC UNE TENSION D'ALIMENTATION CLASSE 2 DE 30 VCC MAXI EN CIRCUIT OUVERT AVEC UN COURANT DE COURT-CIRCUIT DE 8A MAXI.



ATTENTION:
EXPLOSION HAZARD: DO NOT CONNECT OR DISCONNECT EQUIPMENT WHILE CIRCUIT IS LIVE UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS.

RISQUE D'EXPLOSION: NE PAS BRANCHER OU DEBRANCHER TANT QUE LE CIRCUIT EST SOUS TENSION, A MOINS QU'IL NE S'AGISSE D'UN EMPLACEMENT NON DANGEREUX.

Enclosures

The terminal must be mounted in a panel or enclosure to protect the internal circuitry. The terminal meets NEMA Type 4, 12, 13 (indoor use only) or 4X (indoor 2707-V40P2N, -V40P2NR) ratings only when mounted in a panel or enclosure with the equivalent rating.

Allow enough spacing within an enclosure for adequate ventilation. For some applications, you may have to consider heat produced by other devices within a panel. The ambient temperature around the terminal must be maintained as specified. See Specifications Section for ratings.

Make sure that provisions are made for accessing the back panel of the terminal for wiring, routine maintenance, and troubleshooting.

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Equipment Required

Other than the tools required to make the panel cutout, the tools required for installation are:

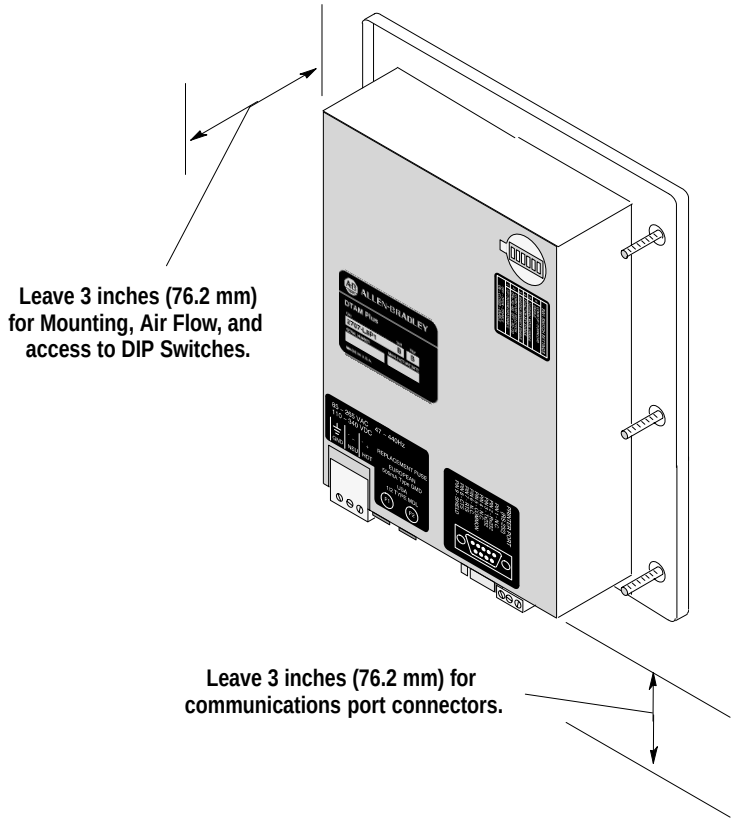
- 7mm (M4) deep well socket wrench or nut driver
- small slotted screwdriver
- torque wrench (in. / lbs).

The terminal is tightened against the panel with six self-locking nuts.

Clearances

Make sure that you leave adequate room, as shown in Figure 1, for mounting, air flow, cabling and access to DIP switches.

Figure 1
Recommended Clearances



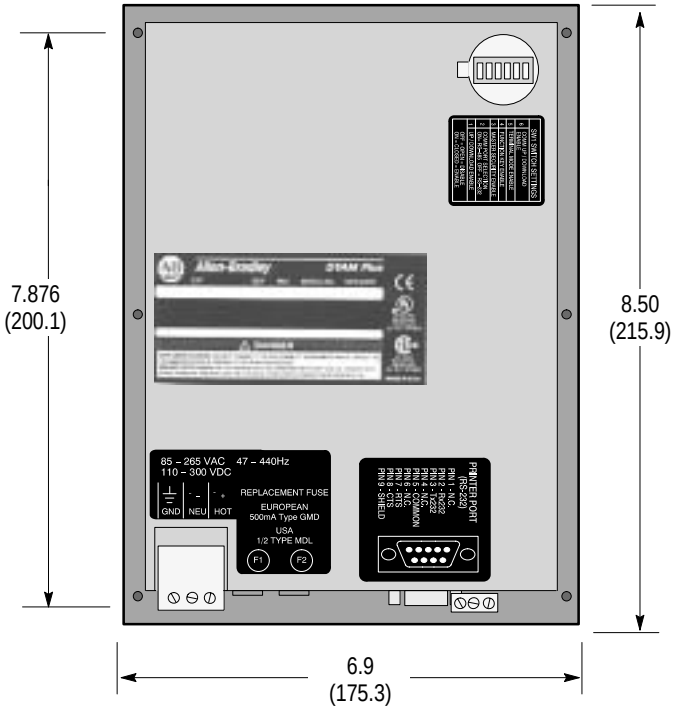
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Mounting Dimensions

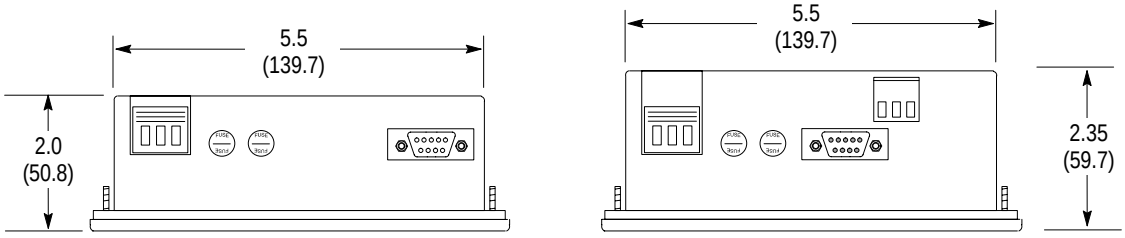
Figure 2 shows the mounting dimensions of the terminal.

Figure 2
Mounting Dimensions in Inches (Millimeters)

Back View



Bottom View



RS-232 / RS-485 Versions

Remote I/O and DN Versions

Installation

To install the DTAM Plus Operator Module:

ATTENTION:
Disconnect all electrical power from the panel before making cutout.

Make sure that area around panel cutout is clear.

Take precautions so that metal filings or other debris do not fall into the DTAM Plus ventilation slots or enter any components that may already be installed in panel.

Make sure that no objects are inserted or fall into the terminal through the ventilation slots or DIP switch access hole.

Failure to follow these warnings may result in personal injury or damage to the panel components.

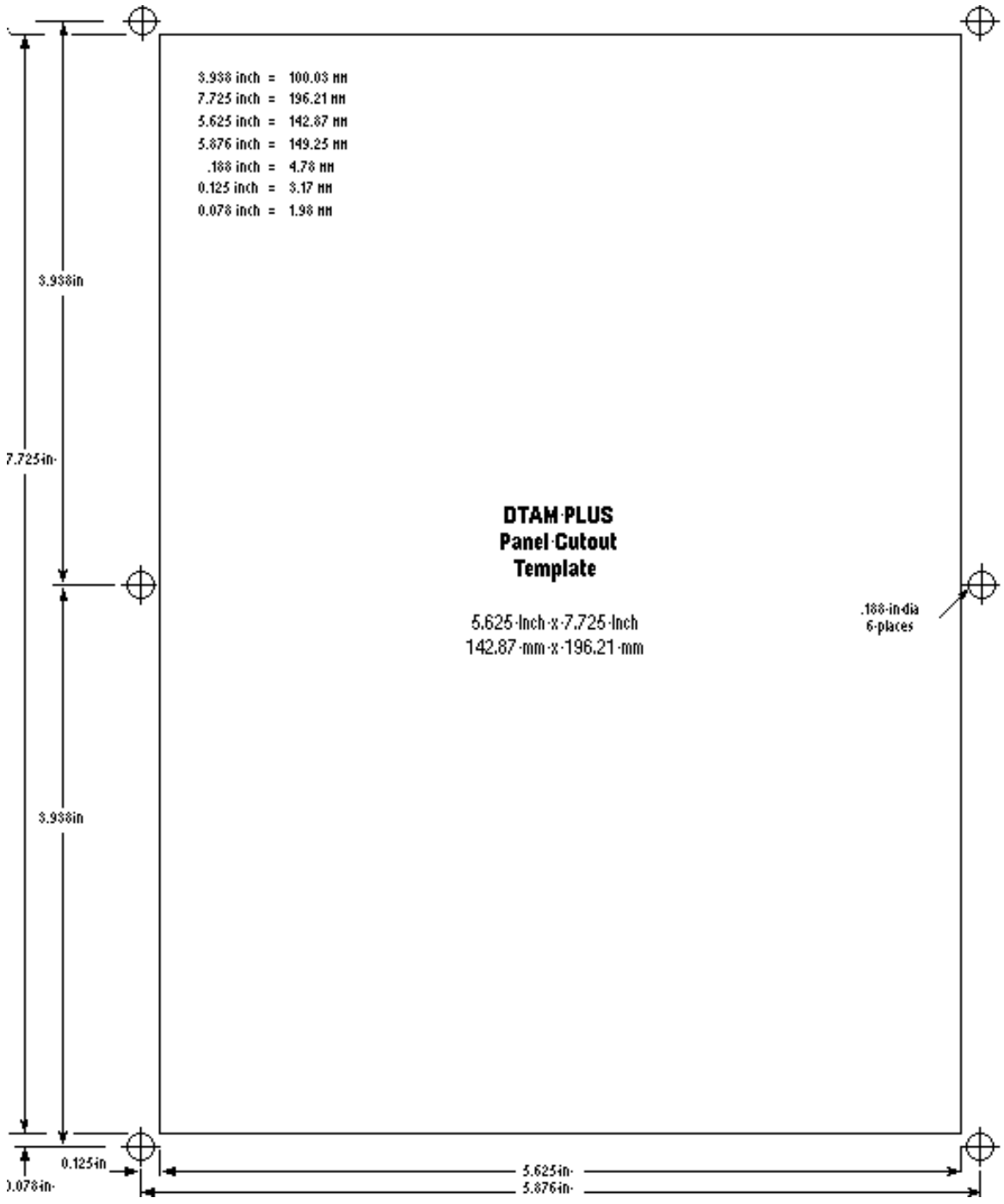
1. Using the cutout template shown in Figure 3, cut an opening in the panel. Remove any sharp edges or burrs.
2. Make sure the sealing gasket is properly positioned on the DTAM Plus. This gasket forms a compression type seal. Do not use sealing compounds.
3. Place the DTAM Plus in the panel cutout.

ATTENTION:
Mounting nuts must be tightened to a torque of 8 to 10 inch pounds to provide a proper seal and to prevent potential damage to the terminal. Allen-Bradley assumes no responsibility for water or chemical damage to the terminal or other equipment within the panel enclosure because of improper installation.

4. Install the six self locking mounting nuts hand tight.
5. Alternately tighten the mounting nuts until the DTAM Plus is held firmly against the panel. Tighten mounting nuts to a torque of 8 to 10 inch-pounds. Do not over-tighten nuts.

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Figure 3
Panel Cutout Dimensions in Inches (Millimeters)



Wire and Cable Length Restrictions

The following wire and cable length restrictions apply to DTAM products that are CE marked when used in installations that require compliance to European EMC Directive 89/336:

DC Power Wiring	10 meters
Ground Terminal Wire	3 meters
Communication Cables	30 meters

These restrictions apply to catalog numbers 2707–L8P1 Series D, 2707–L40P1 Series D and 2707–V40P1 Series D.

Connecting Power

The DTAM Plus accepts supply voltages in the following ranges depending upon the power supply designation.

- Versions with P1 power supply, accept 15-23V AC (47 to 440 Hz) or 20-30V DC
- Series D versions with P1 Power supply only, accepts 20–30 V DC
- Versions with P2 power supply, accept 85-265V AC (47 to 440 Hz) or 110-300V DC
- Versions with P4 power supply, accept 11-13V DC

To connect the DTAM Plus to a power source:



ATTENTION: Verify that the power is disconnected from the power source before wiring. Failure to disconnect power may result in electrical shock.

Make sure that the supply voltage to the DTAM Plus is correct, refer to the voltage label on back of unit. The incorrect voltage may damage the DTAM Plus.

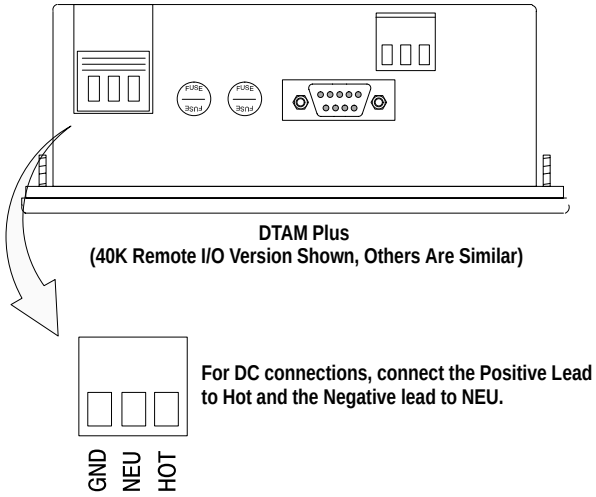
Do not overtighten the power connector screw terminals. Overtightening the terminals may damage the DTAM Plus.

1. Make sure that the voltage source is not turned on.
2. Use AWG#16 or #14 stranded wire to connect the DTAM Plus screw terminals to the power source (see below).

   Note: The power supply terminal block on the DTAM Plus is not removeable.

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Figure 4
Power Connections



3. Connect communications cabling as described in Connecting to Devices section on page 15.
4. Apply voltage and verify the DTAM Plus powerup sequence as described in the next section.

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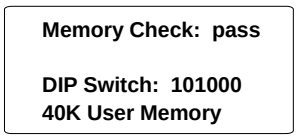
Powerup Sequence

The powerup sequence is automatic. The sequence depends upon the setting of DIP switch position SW-1 (upload / download enable). The DTAM Plus is shipped with SW-1 On.

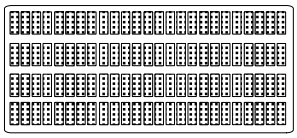
Powerup Sequence (DIP Switch SW-1 ON)

The following steps show the powerup sequence if DIP switch SW-1 is ON.

1. The DTAM Plus verifies the system memory checksum, program checksum, and system RAM. When done, the result is displayed with the current DIP switch settings.

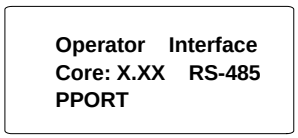


2. The display is tested, every pixel of the display is turned on.

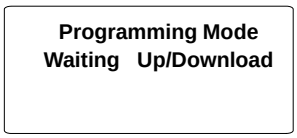


   Use this display to verify that all pixels are operational.

3. The firmware version number and type of communication port(s) is displayed (PPort, RS-232, RS-485 or Remote I/O).



4. The DTAM Plus waits for an application download.



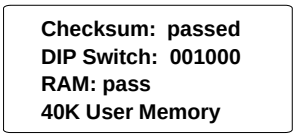
   You cannot operate the DTAM Plus keypad while in the upload/download mode. The DTAM Plus is waiting for upload/download operations with a personal computer running the DTAM Programming Software (DPS).

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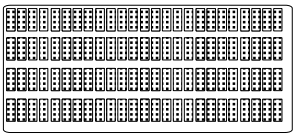
Powerup Sequence (DIP Switch SW-1 OFF)

The following steps show the powerup sequence if DIP switch SW-1 is OFF.

1. The DTAM Plus verifies the system memory checksum, program checksum, and system RAM. After the test is completed, the result is displayed with the current DIP switch settings.

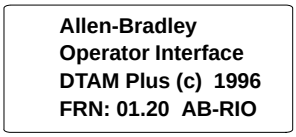


2. The display is tested, every pixel of the display is turned on.

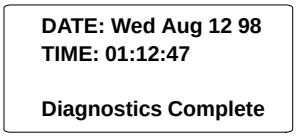


   Use this display to verify that all pixels are operational.

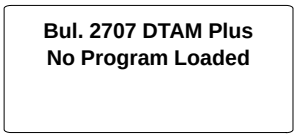
3. The operating system firmware release number and protocol is displayed (PLC5-DF1 or AB DH-485 or Remote I/O).



4. On 40K versions with a clock, the current time setting is displayed.



5. The first application screen displays. When the DTAM Plus is powered up for the first time you see:



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Upload / Download DIP Switch Settings

Before you can upload or download an application, you must verify that DIP switch SW-1 is ON. (DTAM Plus is shipped in this position).

To access the DIP switch, remove the cover from the access hole on the back of the DTAM Plus (align cover tabs with notches in hole to remove). The DTAM Plus is shipped without the cover installed, you can find it in the hardware bag.

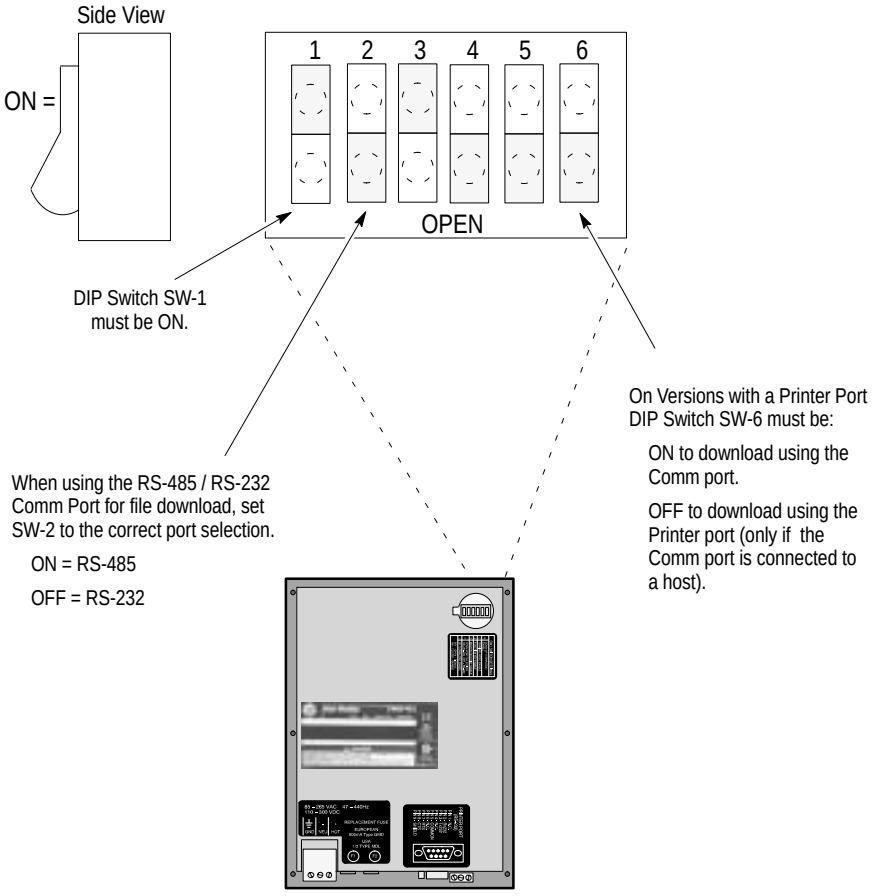
On versions with both a Comm and a Printer port, you can transfer applications using the communication port or the printer port:

- Set DIP switch position SW-6 ON to select the Comm port
- Set DIP switch position SW-6 OFF to select the Printer port

Note: Turn DIP switch SW-6 ON after downloading through the printer port. This allows communications to occur with the controller.

All other versions of the DTAM Plus use a single port to transfer applications; either the Comm port or the Printer port.

If using the Comm port, make sure DIP switch SW-2 is in the correct position (OFF = RS-232 download, ON = RS-485 download).

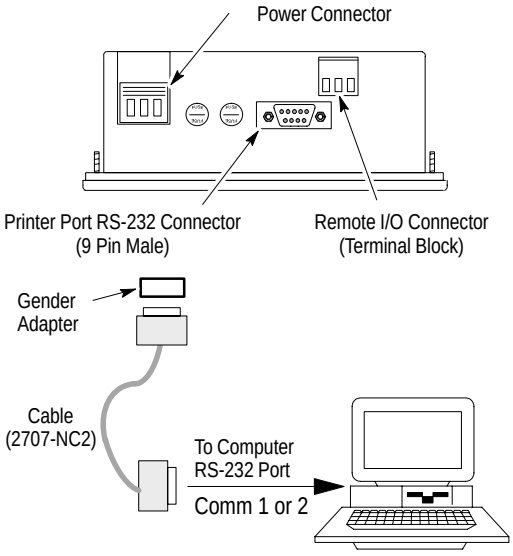


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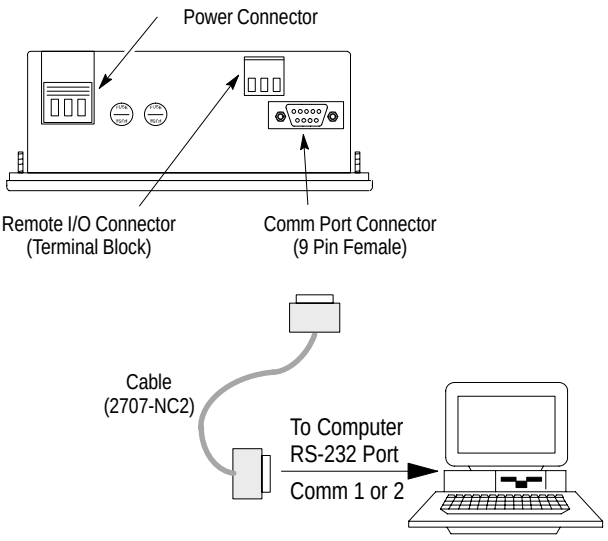
Upload / Download RS-232 Connections

To connect a DTAM Plus RS-232 port to a computer, use the RS-232 Upload/Download cable (Catalog No. 2707-NC2). Use the communications or printer port (see below). You may need a 9-to-25 pin adapter to connect the cable to your computer. A male to female gender adapter is required to connect the cable to the printer port or you can create your own cable. Appendix B of the DTAM Plus User Manual (2707-UM001B–EN–P).

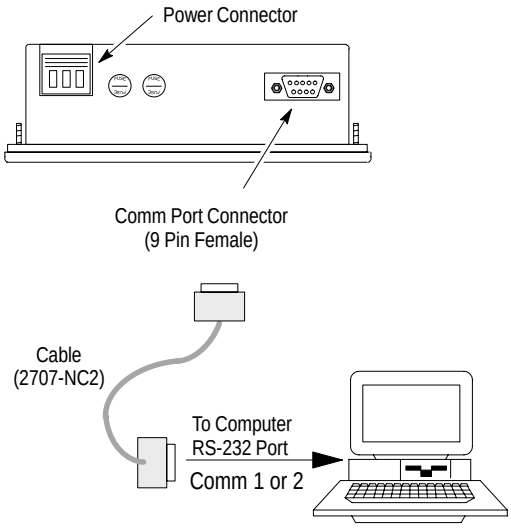
Remote I/O Version With Printer Port



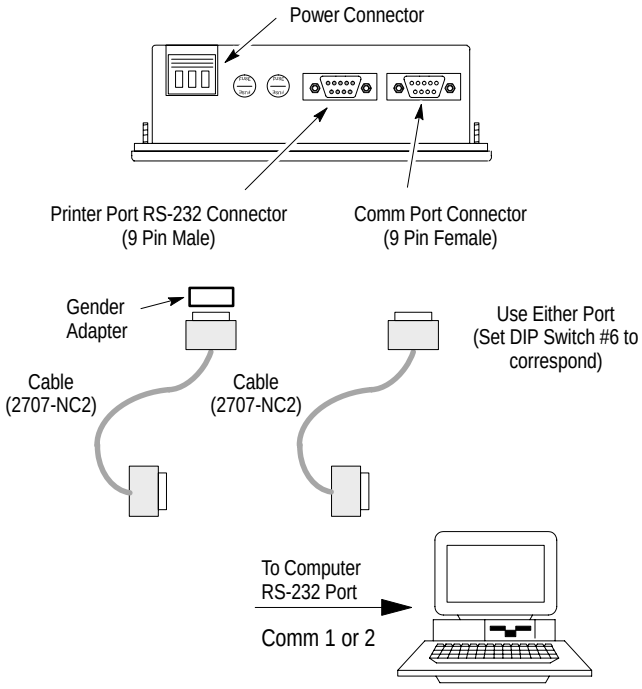
Remote I/O Version With Comm Port



Versions with a Comm Port Only



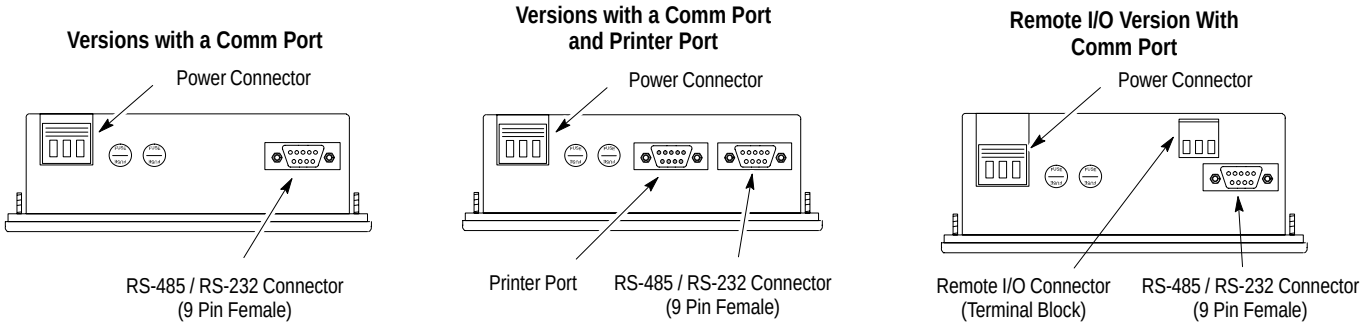
Versions with a Comm Port and Printer Port

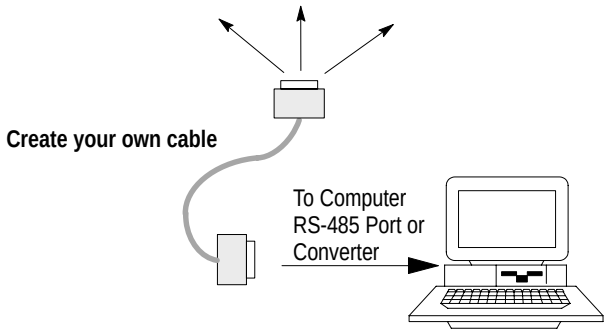


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Upload / Download RS-485 Connections

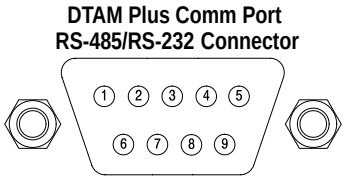
It's recommended that you use the RS-232 port for transferring applications. On DTAM Plus versions with a Comm (RS-485 / RS-232) port, you can also download applications using an RS-485 connection.





To download through the RS-485 port, you must:

- set DIP switch position SW-2 ON
- create a communication cable. The RS-485 port connections are:



Pin 1 = Tx485 -
Pin 2 = Tx485 +
Pin 3 = Rx485 -
Pin 4 = Rx485 +

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Connecting to Devices

To connect the DTAM Plus to an RS-232 device:

1. Make sure that the DTAM Plus is not connected to a voltage source.
2. Use the proper cabling to connect the DTAM Plus Comm port to the port of the controller (PLC-5 channel 0 or SLC 5/03, 5/04 or 5/05 RS-232 port).

   - Use cable, Catalog No. 2707-NC3 for PLC-5 channel 0 connection.
   - Use cable, Catalog No. 1747-CP3 for SLC 5/03, 5/04 or 5/05 port connection. This cable requires a 9-pin female to male gender adapter.

   If you need to make your own cable, refer to the cable diagrams in Appendix B of the DTAM Plus User Manual (2707–UM001B–EN–P). The maximum recommended cable length is 50 feet (15.2 meters).
3. Make sure that the communication parameters of the DTAM Plus match the host device.
4. Apply power and verify that communications are established.

To connect the DTAM Plus terminal to an RS-485 device:

1. Make sure that the power to the DTAM Plus is off.
2. Use the proper cabling to connect the DTAM Plus communications port to the port of the controller (PLC-5 channel 0 or SLC 5/03, 5/04 or 5/05 RS-232 port).

   - Use cable, Catalog No. 2707-NC4 for PLC-5 channel 0 RS-422 connection
   - Use cable, Catalog No. 2707-NC5 for PLC-5 channel 0 RS-232 connection. The 2707-NC5 cable converts the signals from the RS-485 port to RS-232 levels.
   - Use cable, Catalog No. 1747-CP3 for SLC 5/03, 5/04 or 5/05 port connection

   If you need to make your own cable, refer to the connection diagrams in Appendix B of the DTAM Plus User Manual (2707–UM001B–EN–P). The maximum cable length is 200 feet (60.8 meters).

   Important: The DH-485 network cable requires proper shielding, grounding, and termination. Refer to Data Highway / Data Highway Plus / Data Highway-485 Cable Installation Manual (1770-6.2.2).
3. The DH-485 connectors are not electrically isolated. If electrical isolation is required, use Link Couplers (Catalog No. 1747-AIC).



ATTENTION: Electrical isolation using Link Couplers (Catalog No. 1747-AIC) is required in applications where the distance between the DTAM Plus terminal and the SLC is greater than 6.5 feet (2 meters).

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4. Make sure that the communication parameters of the DTAM Plus terminal match the host device.
5. Apply power and verify that communications are established.

To connect the DTAM Plus terminal to Remote I/O:

1. Make sure that the power to the DTAM Plus is off.
2. The Remote I/O port of the DTAM Plus provides access via a Remote I/O link directly to a controller or subscanner. Use cable (Catalog No. 1770–CD) Belden 9463 for all Remote I/O connections. Refer to Publication 1770–4.1 for detailed grounding and wiring guidelines. The User Manual for your controller or subscanner will also provide cabling instructions.
3. Make sure that the communication parameters of the DTAM Plus terminal match the host device.
4. Apply power and verify that communications are established.

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DTAM Plus Specifications

Display

Column and Character	4 lines x 20 characters
Display Technology	
LCD (2707-L versions)	Twisted-nematic type with adjustable LED (yellow) backlighting
VFD (2707-V versions)	Vacuum Fluorescent Display with viewing distance that exceeds 25 feet (7.6 meters)
Backlight Settings for LCD Version (via Keypad)	Four (0,33,66 and 100%)
Contrast Ratio	10:1
Contrast/Brightness Settings (Keypad)	
LCD (2707-L versions)	4 settings
VFD (2707-V versions)	2 settings
Display Size (H x W)	
LCD (2707-L versions)	1.0 x 3.0 in (25.2 x 76.0 mm)
VFD (2707-V versions)	1.3 x 3.9 in (33.0 x 99.0 mm)
Character Size (H x W)	0.19 x 0.12 in (4.75 x 2.95 mm)

Keypad

Keypad Type	Embossed, sealed membrane
Tactile Feedback	Stainless steel dome
Operation Force	12 oz. ± 3 oz. (340 grams ± 85 grams)
Operational Life	1 million cycles

Electrical

Comm Port	RS-485 or RS-232C (configurable)
Printer Port (40K memory units)	RS-232C
Serial Communication Distances	
RS-485	4,000 ft (1219 meters) maximum with the Link Coupler (Catalog No. 1747-AIC)
RS-232C	50 ft (15 meters) maximum
RS-422	200 ft (61 meters) maximum to a PLC-5
Remote I/O Communication Distances	
57.6K	10,000 ft (2800 meters) maximum
115.2K	5,000 ft (1400 meters) maximum
230.4K	2,500 ft (700 meters) maximum

Voltage, Current, Fusing Requirements

Power Supply	Voltage	Current	Fuse
P1	15 - 23V AC, 47 - 440 Hz or 20 - 30V DC	800 mA max.	1 amp
P2	85 - 265V AC, 47 - 440 Hz or 110 - 300V DC	300 mA max.	1/2 amp
P4	11 - 13V DC	250 mA max.	1/2 amp

Port Isolation	
Communication Port	500V isolation
Printer Port	500V isolation

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Environmental

Ambient Temperature Rating	
Operating	
LCD Display	0 to +45° C (32 to 113° F)
VFD Display	0 to +60° C (32 to 140° F)
Storage	-20 to +85° C (-4 to 185° F)
Relative Humidity	5 to 95%, noncondensing

Mechanical

Dimensions (Approximate)	
Height:	7.6 inch (193.0 mm)
Width:	5.5 inch (139.7 mm)
Depth:	
RS-232 / RS 485 Versions	1.8 inch (45.7 mm)
Remote I/O Versions	2.35 inch (59.7 mm)
Front Panel Size:	
Height:	8.5 inch (215.9 mm)
Width:	6.5 inch (165.1 mm)
Weight	
All except 2707-V40P2N, -V40P2NR	2.1 lbs (0.95 kg)
2707-V40P2N, -V40P2NR	4.6 lbs (2.09 kg)
LED Indicators	
RUN LED	Green
Alarm LED	Red
Function LED	Yellow

Agency Ratings

NEMA Type 4, 12, 13 (indoor use only)
NEMA Type 4X (2707-V40P2N, 2707-V40P2NR only)

Class 1 Division 2 Groups A, B, C, D, hazardous locations①

Class 1 Division 2 Groups A, B, C, D, hazardous locations①

Class 1 Division 2 Groups C & D, hazardous locations①
Temperature Code T3C (2707–L40P4 only)

①

① Series B or higher – Cat. Nos. 2707–L8P1R, –L8P2R, –L40P1R, –L40P2R, –V40P1R, –V40P2R, –V40P2NR, –L40P4, –L8P1D, –L8P2D, –L40P1D, –L40P2D, –V40P1D, –V40P2D, –V40P2ND
Series C or higher – Cat. Nos. 2707–L8P1, –L8P2, –L40P1, –L40P2, –V40P2, –VP40P1, –VP40P2, –V40P2N
Series D Only – Cat. Nos. 2707–L8P1, –L40P1, –V40P1

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European Union Directive Compliance

If this product is installed within the European Union or EFTA regions, the following regulations apply:

This apparatus is tested to meet Council Directive 89/336 Electromagnetic Compatibility (EMC) standards:

- EN50081–2 Class A (Industrial) Emissions
- EN50082–2 Class A (Industrial) Immunity
- EN61000–6–2 Class A (Industrial) Immunity (Series D Only; 2707–L8P1, –L40P1, –V40P1: Series C Only; 2707–L8P2, –L40P2, –V40P2, V40P2N)

According to these Standards, the factor which determines, for EMC pruposes, whether an apparatus is deemed to be “Industrial” or “Residential, commercial and light industrial”, is given in Clause 1 of EN50081–2 as follows:

> Apparatus covered by this standard is not intended for connection to a public mains network, but is intended to be connected to a power network supplied from a high– or medium–voltage transformer dedicated for the supply of an installation feeding a manufacturing or similar plant.

The product described in this document is intended solely for use in an industrial environment as defined above. When installed in Europe, any other application is in contravention of the European Union Directives, and a breach of those laws.

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Getting Technical Assistance

If you need technical assistance, please review the information in Chapter 8, “Troubleshooting and Maintenance” before calling your local distributor of Spectrum Controls.

Note that your module contains electronic components which are susceptible to damage from electrostatic discharge (ESD). An electrostatic charge can accumulate on the surface of ordinary plastic wrapping or cushioning material. **In the unlikely event that the module should need to be returned to Spectrum Controls, please ensure that the unit is enclosed in approved ESD packaging (such as static-shielding / metallized bag or black conductive container)**. Spectrum Controls reserves the right to void the warranty on any unit that is improperly packaged for shipment.

For further information or assistance, please contact your local distributor, or call the Spectrum Controls technical Support at :

USA - 440-646-6900
United Kingdom - 01908 635230
Australia - 800-809-929 or (61) 398-990-335
Brazil - (55) 11 3618 8800
Europe - (49) 2104 960 333

Declaration of Conformity

Declaration available upon request.

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Corporate Headquarters
Spectrum Controls Inc.
P.O. Box 5533
Bellevue, WA 98006 USA
Fax: 425-641-9473
Tel: 425-746-9481
Web Site: www.spectrumcontrols.com
E-mail: spectrum@spectrumcontrols.com

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