



DTAM Plus Operator Interface

(Catalog Nos. 2707-L8PxX, -L40PxX, -V40PxX)

Installation Instructions

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 | 2707-UM001B-EN-P |
| • Intrinsically Safe DTAM Plus (2707-L40P4) | 2707-800.6 |
| • DTAM Plus DeviceNet Operator Interface | 2707-800.7 |

These publications are available for viewing and download from the Rockwell Automation/Allen-Bradley Website at www.ab.com.

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.



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.

Equipment Required

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

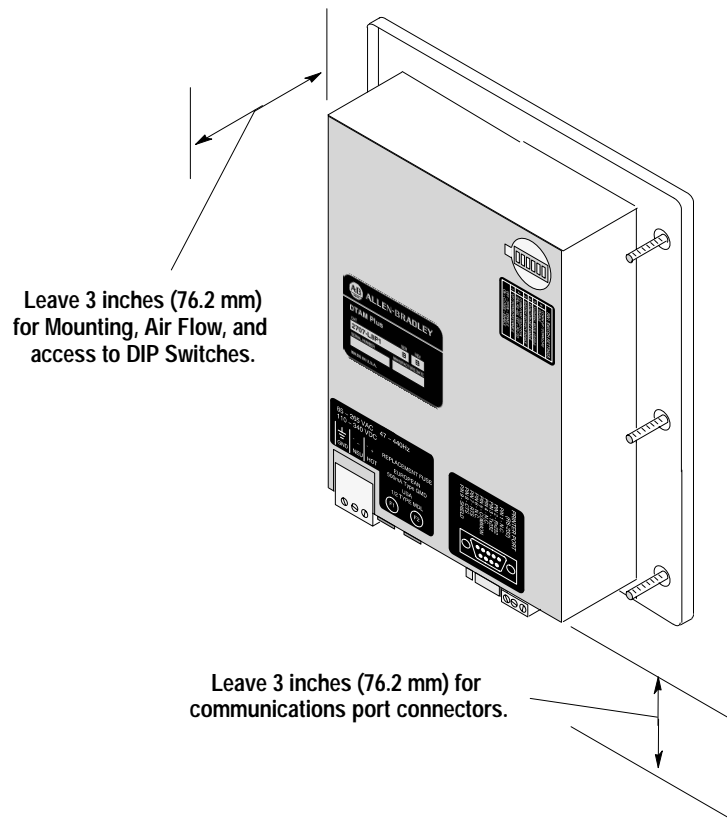
- 7mm (M4) deep well socket wrench or nut driver
- small slotted screwdriver
- torque wrench (in. / lbs).

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.

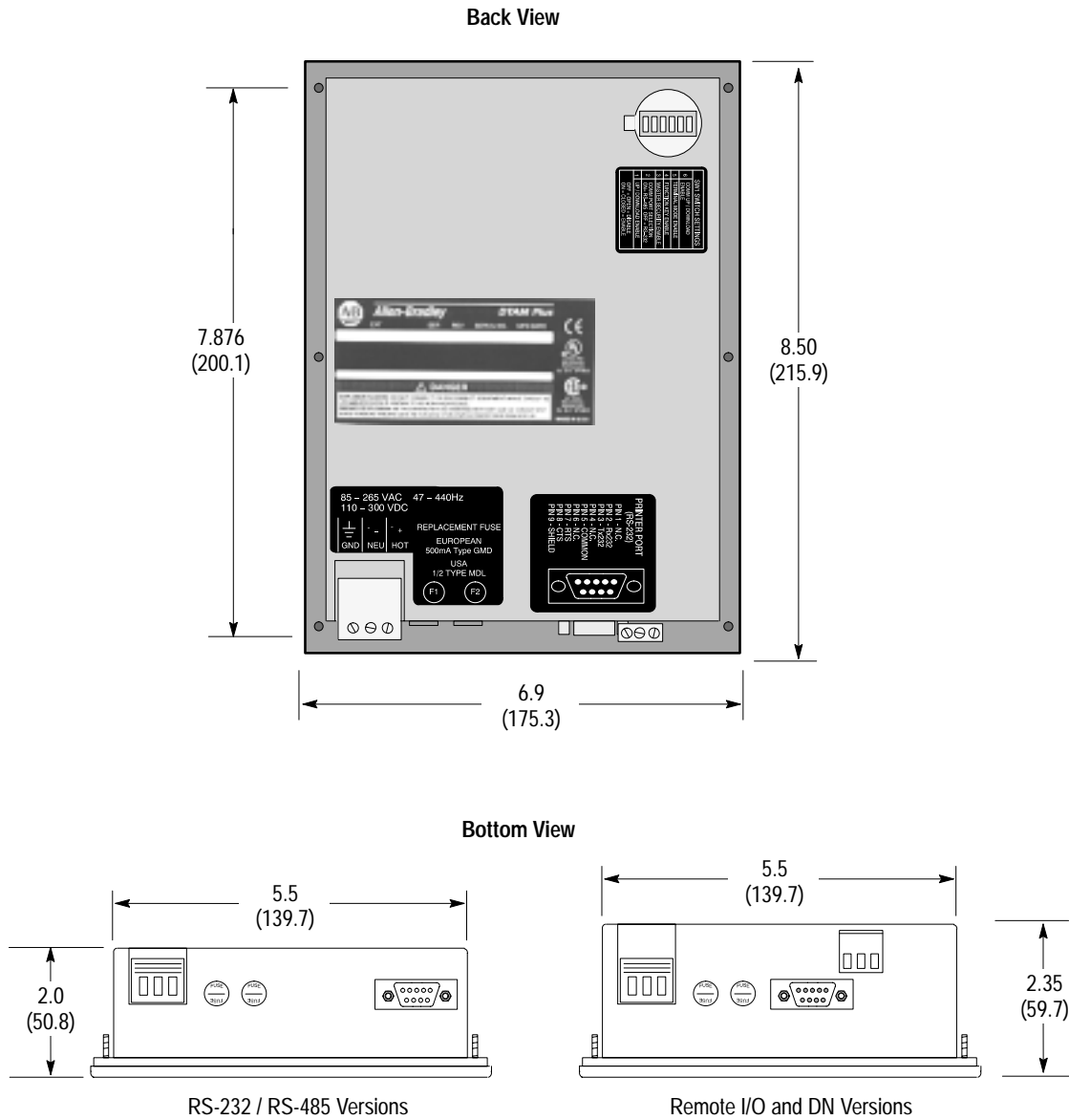
Figure 1
Recommended Clearances



Mounting Dimensions

Figure 2 shows the mounting dimensions of the terminal.

Figure 2
Mounting Dimensions in Inches (Millimeters)



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.

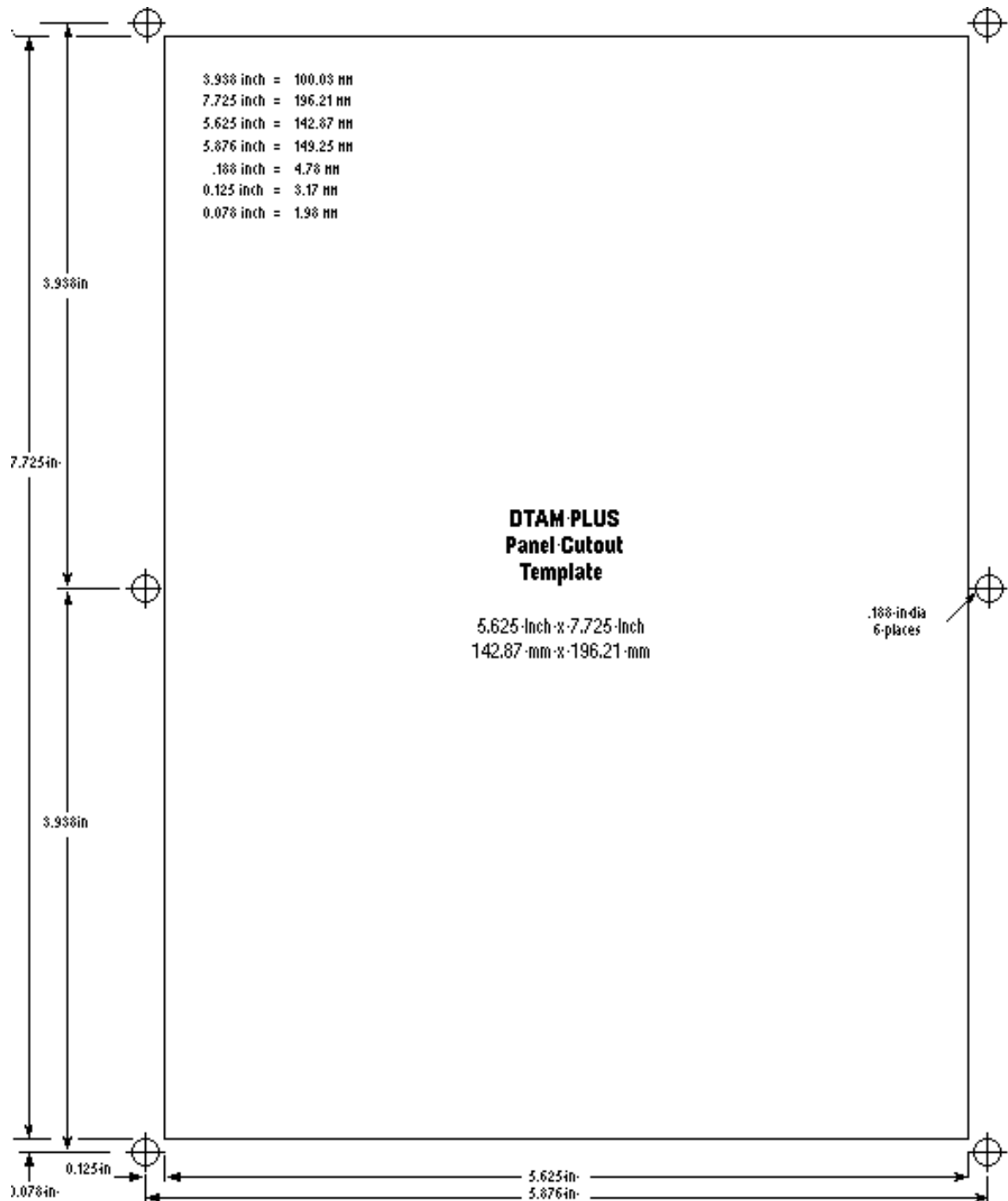
1. Using the cutout template shown in Figure 3, cut an opening in the panel. Remove any sharp edges or burrs.
 2. Make sure the sealing gasket is properly positioned on the DTAM Plus. This gasket forms a compression type seal. Do not use sealing compounds.
 3. Place the DTAM Plus in the panel cutout.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

**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.

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.

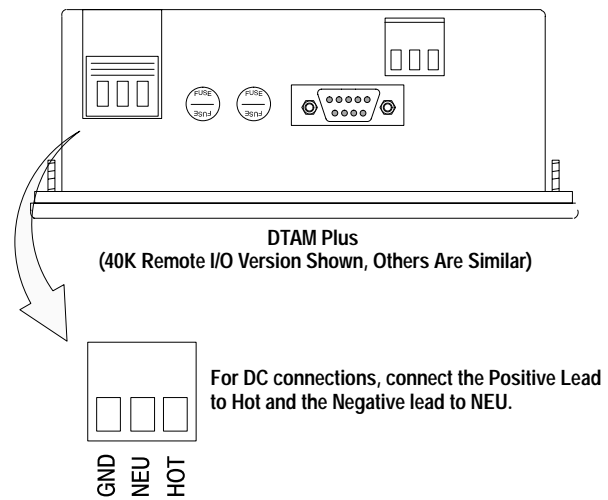
Make sure that the supply voltage to the DTAM Plus is correct, refer to the voltage label on back of unit. The incorrect voltage may damage the DTAM Plus.

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.

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.

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)

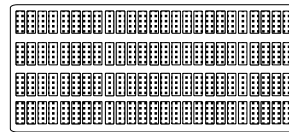
The following steps show the powerup sequence if DIP switch SW-1 is ON.

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.

Memory Check: pass

DIP Switch: 101000
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 firmware version number and type of communication port(s) is displayed (PPort, RS-232, RS-485 or Remote I/O).

Operator Interface
Core: X.XX RS-485
PPORT

4. The DTAM Plus waits for an application download.

Programming Mode
Waiting Up/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).

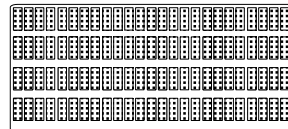
Powerup Sequence (DIP Switch SW-1 OFF)

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

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.

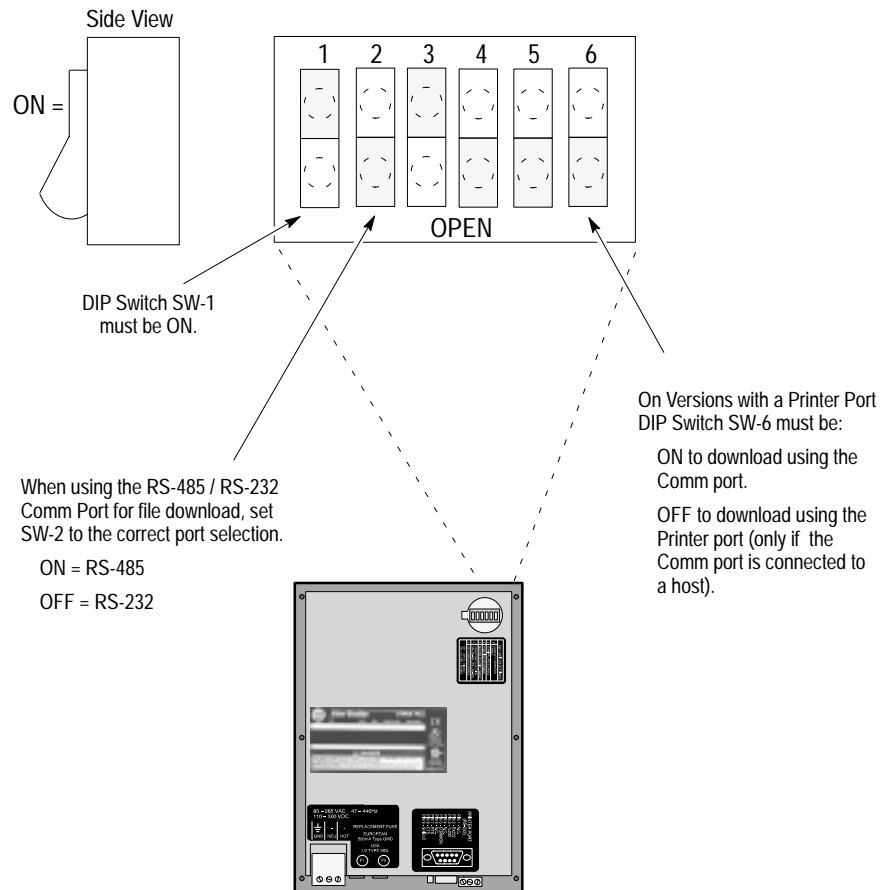
On versions with both a Comm and a Printer port, you can transfer applications using the communication port or the printer port:

- 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.

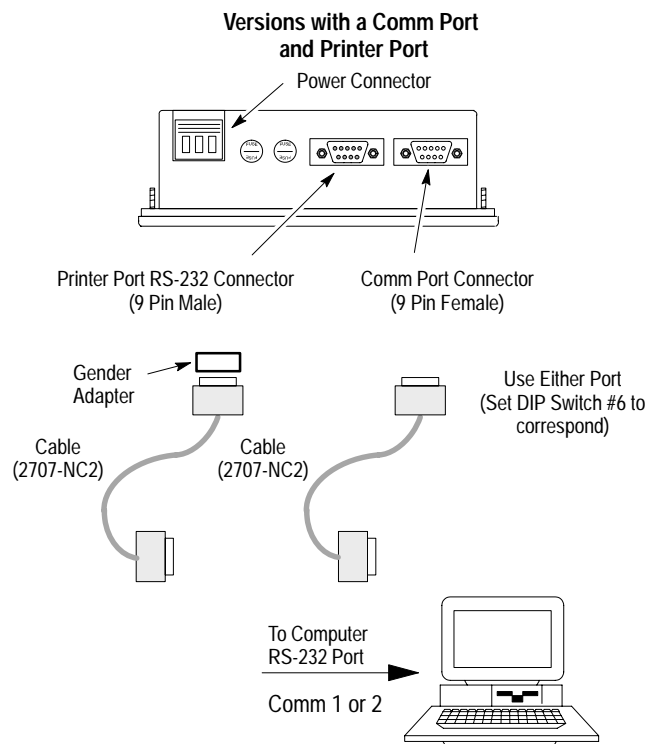
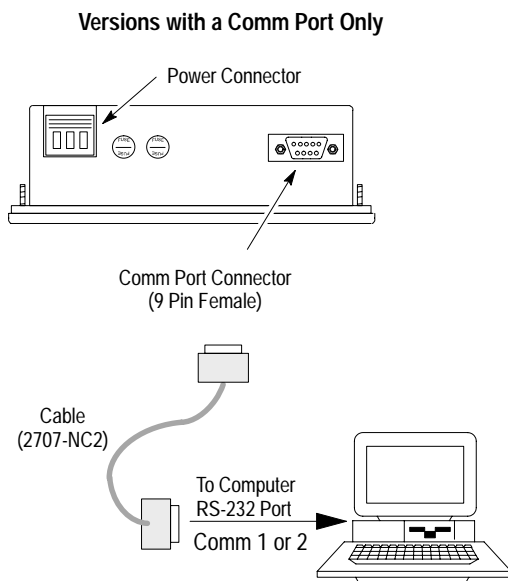
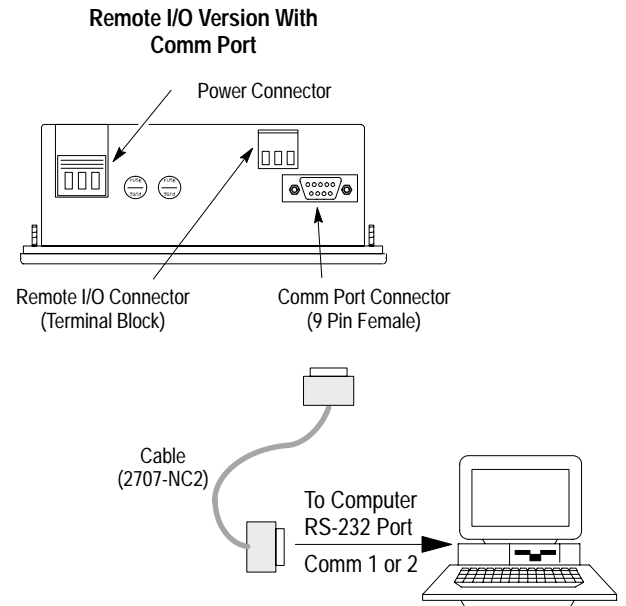
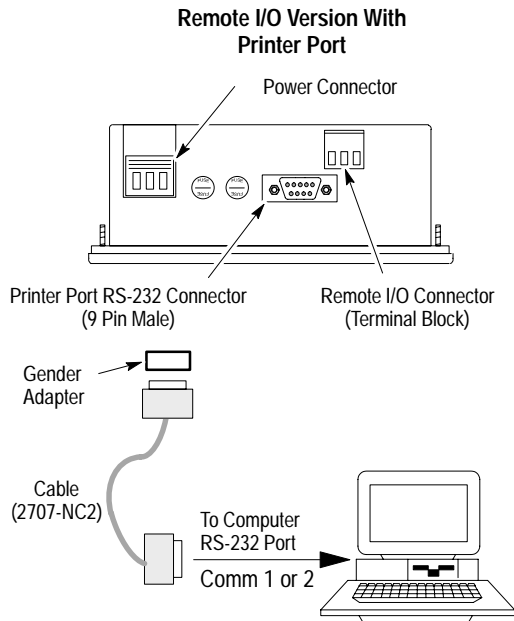
All other versions of the DTAM Plus use a single port to transfer applications; either the Comm port or the Printer port.

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



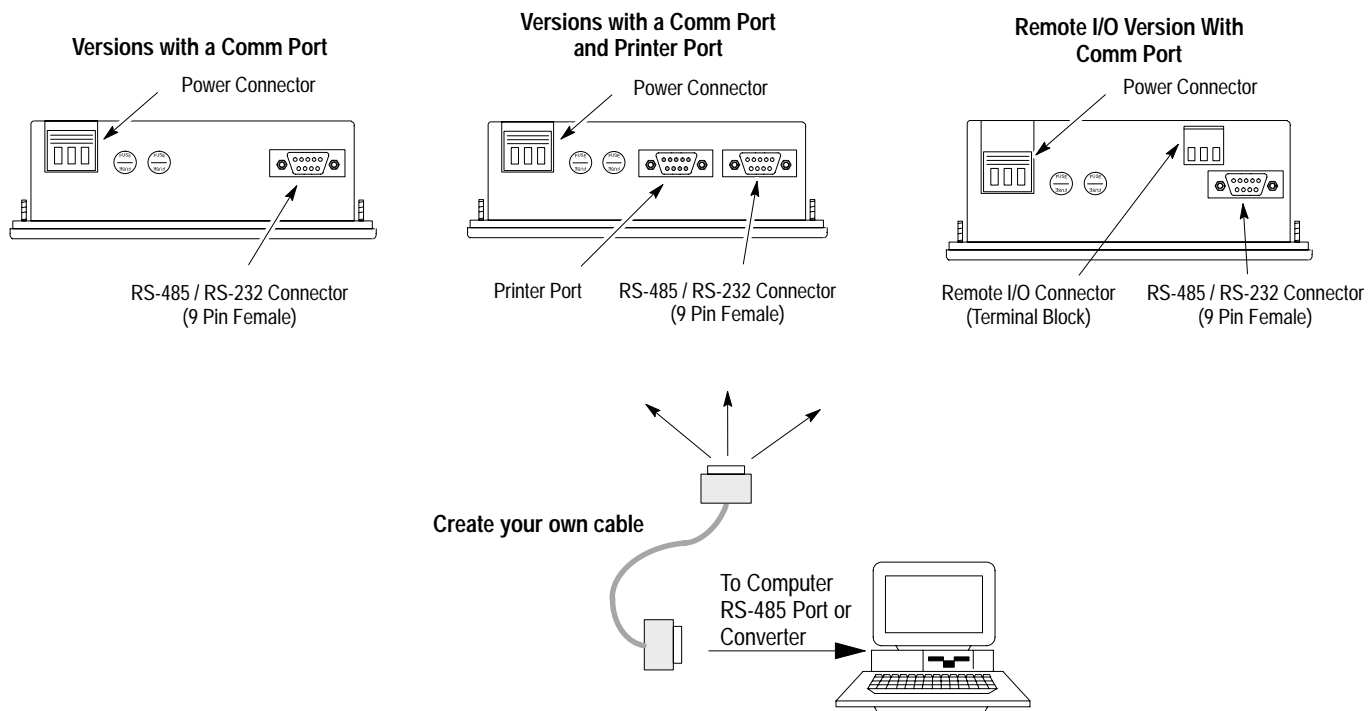
Upload / Download RS-232 Connections

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).



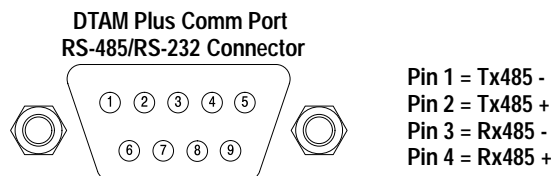
Upload / Download RS-485 Connections

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:



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).

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.

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. \pm 3 oz. (340 grams \pm 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 |

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 locations^①Class 1 Division 2 Groups A, B, C, D, hazardous locations^①Class 1 Division 2 Groups C & D, hazardous locations^①

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

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 purposes, 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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