

## Application Note #1188: GP-Pro EX to Allen Bradley DH+ via Gateway

### Overview

This document describes how to connect a Pro-face GP-Pro EX display via a Pro-face CA9-DH3000- PFA01 gateway to one or more Allen Bradley PLCs on a Data Highway Plus (DH+) network. The Pro-face display communicates using the standard GP-Pro EX Rockwell Automation DF1 serial driver through a gateway residing on the DH+ network. Apply the Pro-face Multilink feature and multiple displays can access multiple PLCs through a single gateway on the DH+ network.



This application note is an addendum to the Pro-face PLC/Device connection manual “Rockwell Automation DF1 Driver”. The sections in this guide supplement those in the manual. Refer to both documents to configure the gateway and DH+ application.

It is possible you do not need a gateway. A Pro-face display can be connected without a gateway to multiple PLCs via DH+ using the SLC5/04 pass-through feature. Include the Pro-face Multilink feature and multiple displays can access multiple PLCs on the DH+ network. For more information about this solution see Application Note 1180 “GP-Pro EX to Allen Bradley DH+ via SLC504 PassThru”.

### 1 System Configuration

The system configuration in the case when the External Device of Rockwell Automation PLC(s) and the Display are connected is shown. Multiple PLC-5 and SLC504 PLCs on the same DH+ network can be connected via a single gateway to the same Pro-face display.

Series	CPU Module	Link I/F	SIO Type	Setting Example	Cable Diagram
SLC500	SLC 5/04	CA9-DH3000-PFA01 Pro-face Gateway	RS232C	Setting Example 1	Cable Diagram 1
PLC-5	PLC-5/11 PLC-5/20 PLC-5/30 PLC-5/40 PLC-5/40L PLC-5/60 PLC-5/60L		RS422/485 (4wire)	Setting Example 2	Cable Diagram 2

### 2 Selection of External Device

Refer to the Pro-face PLC/Device connection manual “Rockwell Automation DF1 Driver “Section 2 Selection of External Device for a full explanation. To connect to the DH+ network use these settings to select the Device/PLC:

Manufacturer: Rockwell Automation, Inc.  
Series: DF1

### 3 Example of Communication Setting

#### 3.a Setting Example 1

##### Settings of GP-Pro EX Communications Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace. The communication settings of the PLC(s) are not considered. The communication settings should match the settings of the CA9-DH3000-PFA01 gateway. The Source ID should be the gateway DH+ decimal network address.

Device/PLC 1

Summary [Change Device/PLC](#)

Manufacturer  Series  Port

Text Data Mode  [Change](#)

Communication Settings

SIO Type  RS232C  RS422/485(2wire)  RS422/485(4wire)

Speed

Data Length  7  8

Parity  NONE  EVEN  ODD

Stop Bit  1  2

Flow Control  NONE  ER(DTR/CTS)  XON/XOFF

Timeout  (sec)

Retry

Wait To Send  (ms)

DF1 Protocol

DF1 Mode

Error Detection

Source ID

RI / VCC  RI  VCC

In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (5V Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.

[Default](#)

Device-Specific Settings

Allowable Number of Devices/PLCs 16

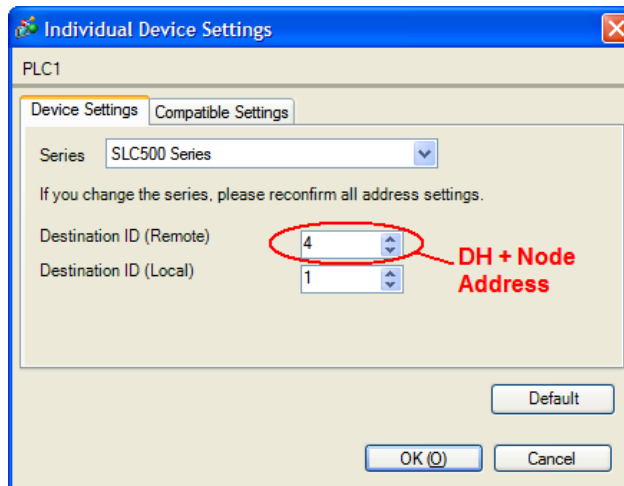
Number	Device Name	Settings
1	PLC1	Series=PLC-5 Series,Compatible Settings=Standard Mode,Destination ID (Remot

Device Setting

The device settings should match those configured in the individual PLC on the DH+ network. A separate device should be configured for each PLC on the DH+ network to be accessed by the GP-Pro EX project.

To display the setting screen, click the Settings icon of External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings]. The Destination ID (Remote) is the Data highway Plus (DH+) Node Address of the PLC.

- Series: SLC500 or PLC5
- Destination ID (Remote): DH+ Node Address of the PLC (decimal)
- Destination ID (Local): Not used
- Compatible Settings Tab: Standard Mode (default)



*Note: For Full Duplex, "Destination ID (Local)" is not used.*

**Settings of External DH+ Gateway Device**

Install the Equustek DL32 configuration software provided with the gateway. Use it to configure the gateway communication settings. Connect your computer to the CA9-DH3000-PFA01 gateway using a USB cable or serial cable. On the "Welcome to DL32" screen click on DL3500 models. Click [yes]. Click on [DF1 to DH+/DH485]. Select the COM PORT the PC is using to communicate with the gateway. If you are using a USB cable check in Windows Control Panel under Device Manager for "USB serial port (com\_)" to find the assigned COM port number.

The settings should match those of the DH+ network and the connected Pro-face display. Select an available DH+ network address. The DF1 parameters should match the configuration of the connected Pro-face display. Other DF1 configuration settings:

- Duplicate Message = Ignore.
- Embedded Responses = None
- DF1 Channel configuration = Point-Point / Full Duplex

Configuration of [DL3500-DF1] - MAIN MENU

**OPERATING MODE SELECTION**

DF1 via USB/Serial to DH+       BRIDGING (DF1 to DH+)

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**AB DH+ NETWORK PARAMETERS**

A-B - DH+       A-B - DH-485

**Network Address**  **Octal**      **Network Speed**  **KBaud**

**Decimal**

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**DF1 SERIAL/USB COMMUNICATION PROTOCOL**

**CHANNEL SERIAL SPEED**  **KBaud**      **SET/CHANGE CHANNEL SERIAL PARAMETERS**

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**ADVANCED DF1 PROTOCOL PARAMETERS**

**SET ADVANCED DF1 PROTOCOL PARAMETERS**

**STATUS**      Click on " **DOWNLOAD to DL** " to download these parameters.

**CONFIGURATION Settings**      **DOWNLOAD to DL**      **RETURN to Main Menu**

**DF1 SERIAL/USB PARAMETERS**

**PRESS BUTTONS TO TOGGLE THE FOLLOWING OPTIONS:**

**PARITY**

NONE       YES

**PARITY**

ODD       EVEN

**DATA BITS**

8       7

**STOP BITS**

1       2

**HANDSHAKING**

IGNORE       ACTIVE

**SERIAL CONNECTION**

RS-232C       RS422/485

**ACCEPT**

**DF1 ADVANCED PARAMETERS**

**PRESS BUTTONS TO TOGGLE THE FOLLOWING OPTIONS:**

**MESSAGE CHECK**

BCC       CRC

**DUPLICATE MESSAGE**

IGNORE       ACCEPT

**EMBEDDED RESPONSES**

NONE       EXECUTE

**DIAGNOSTICS**

EXECUTE       PASS

**DF1 CHANNEL CONFIGURATION**

POINT-POINT / FULL DUPLEX

MULTI-DROP / HALF DUPLEX

**ACCEPT**

### 3.b Setting Example 2

#### Settings of GP-Pro EX Communications Settings

To display the setting screen, select [Device/PLC Settings] from [System setting window] in workspace. The communication settings of the PLC(s) are not considered. The communication settings should match the settings of the DL3500 gateway. The Source ID should be the gateway DH+ decimal network address.

Device/PLC 1

Summary [Change Device/PLC](#)

Manufacturer  Series  Port

Text Data Mode  [Change](#)

Communication Settings

SIO Type  RS232C  RS422/485(2wire)  RS422/485(4wire)

Speed

Data Length  7  8

Parity  NONE  EVEN  ODD

Stop Bit  1  2

Flow Control  NONE  ER(DTR/CTS)  XON/XOFF

Timeout  (sec)

Retry

Wait To Send  (ms)

DF1 Protocol

DF1 Mode

Error Detection

Source ID  **Gateway DH+ address (decimal)**

RI / VCC  RI  VCC

In the case of RS232C, you can select the 9th pin to RI (Input) or VCC (5V Power Supply). If you use the Digital's RS232C Isolation Unit, please select it to VCC.

Device-Specific Settings

Allowable Number of Devices/PLCs 16

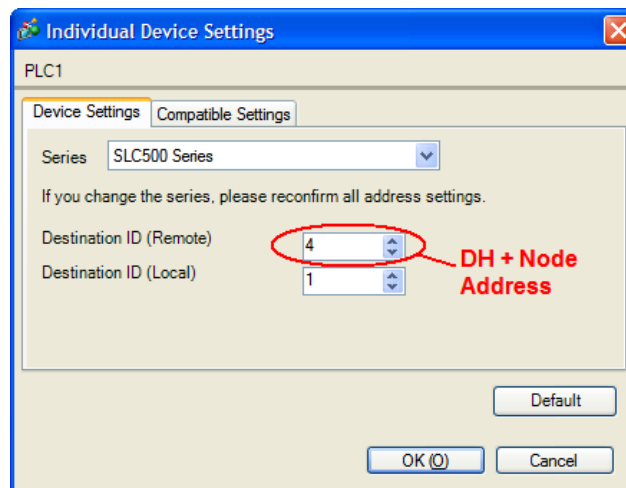
Number	Device Name	Settings
1	PLC1	Series=PLC-5 Series,Compatible Settings=Standard Mode,Destination ID (Remot

### Device Setting

The device settings should match those configured in the individual PLC on the DH+ network. A separate device should be configured for each PLC on the DH+ network to be accessed by the GP-Pro Ex project.

To display the setting screen, click the Settings icon of External Device you want to set from [Device-Specific Settings] of [Device/PLC Settings]. The Destination ID (Remote) is the Data highway Plus (DH+) Node Address of the PLC.

- Series: SLC500 or PLC5
- Destination ID (Remote): DH+ Node Address of the PLC
- Destination ID (Local): Not used
- Compatible Settings: Standard Mode (default)



*Note: For Full Duplex, "Destination ID (Local)" is not used.*

### **Settings of External DH+ Gateway Device**

Install the Equustek DL32 configuration software provided with the gateway. Use it to configure the gateway communication settings. Connect your computer to the CA9-DH3000-PFA01 gateway using a USB cable or serial cable. On the "Welcome to DL32" screen click on DL3500 models. Click [yes]. Click on [DF1 to DH+/DH485]. Select the COM PORT the PC is using to communicate with the gateway. If you are using a USB cable check in Windows Control Panel under Device Manager for "USB serial port (com\_)" to find the assigned COM port number.

The settings should match those of the DH+ network and the connected Pro-face display. Select an available DH+ network address. The DF1 parameters should match the configuration of the connected Pro-face display. Other DF1 configuration settings:

- Duplicate Message = Ignore.
- Embedded Responses = None
- DF1 Channel configuration = Point-Point / Full Duplex



Configuration of [DL3500-DF1] - MAIN MENU

**OPERATING MODE SELECTION**

DF1 via USB/Serial to DH+       BRIDGING (DF1 to DH+)

---

**AB DH+ NETWORK PARAMETERS**

A-B - DH+       A-B - DH-485

Network Address:  Octal      Network Speed:  Kbaud  
 Decimal

---

**DF1 SERIAL/USB COMMUNICATION PROTOCOL**

CHANNEL SERIAL SPEED:  Kbaud      SET/CHANGE CHANNEL SERIAL PARAMETERS

---

**ADVANCED DF1 PROTOCOL PARAMETERS**

SET ADVANCED DF1 PROTOCOL PARAMETERS

STATUS      Click on " DOWNLOAD to DL " to download these parameters.

CONFIGURATION Settings      DOWNLOAD to DL      RETURN to Main Menu

**DF1 SERIAL/USB PARAMETERS**

PRESS BUTTONS TO TOGGLE THE FOLLOWING OPTIONS:

**PARITY**

NONE       YES

**PARITY**

ODD       EVEN

**DATA BITS**

8       7

**STOP BITS**

1       2

**HANDSHAKING**

IGNORE       ACTIVE

**SERIAL CONNECTION**

RS-232C       RS422/485

**ACCEPT**

**DF1 ADVANCED PARAMETERS**

PRESS BUTTONS TO TOGGLE THE FOLLOWING OPTIONS:

**MESSAGE CHECK**

BCC       CRC

**DUPLICATE MESSAGE**

IGNORE       ACCEPT

**EMBEDDED RESPONSES**

NONE       EXECUTE

**DIAGNOSTICS**

EXECUTE       PASS

**DF1 CHANNEL CONFIGURATION**

POINT-POINT / FULL DUPLEX

MULTI-DROP / HALF DUPLEX

**ACCEPT**

**4 Setup Items**

Refer to the Pro-face PLC/Device connection manual “Rockwell Automation DF1 Driver” Section 4.

**5 Cable Diagrams**

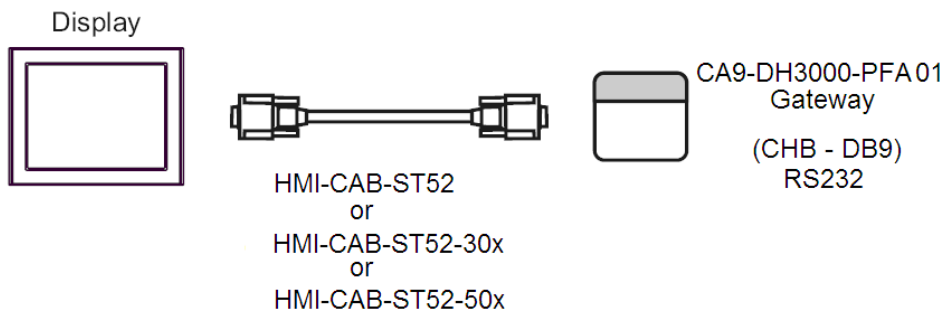
**Connection notes:**

- The FG pin of the External Device body must be D-class grounded. Please refer to the manual of the External Device for more details.
- SG and FG are connected inside the display. When connecting SG to the External Device, design the system to not form short-circuit loop.
- Connect the isolation unit, when communication is not stabilized under the influence of noise etc.

**Cable Diagram 1**

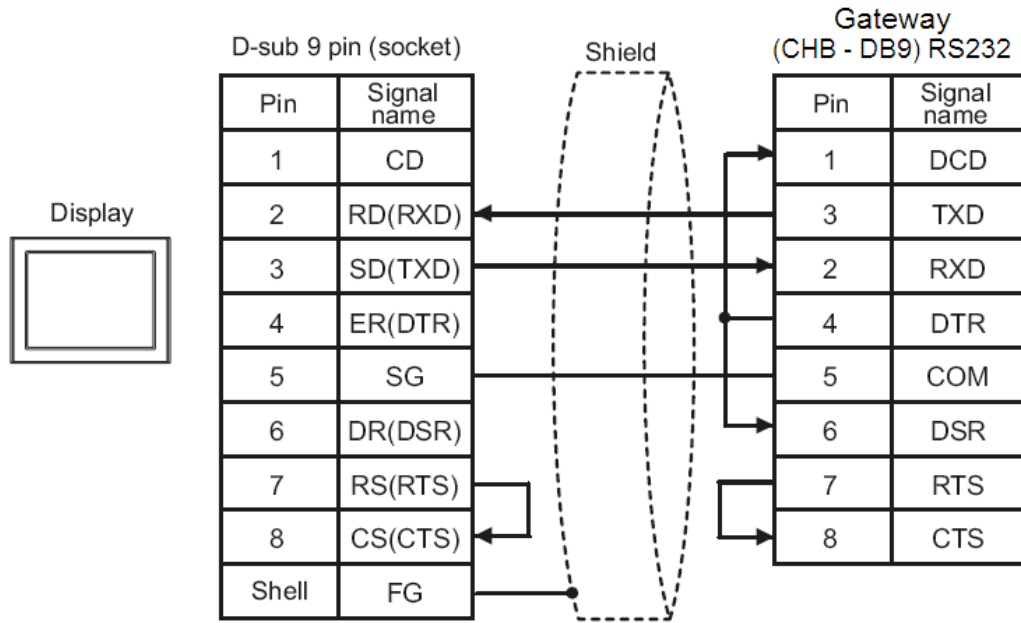
Display (Connection Port)	PLC (Connection Port)	Cable	Diagram	Remarks
AGP/AST(COM1) LT3300 GP4000 (COM1) * SIO Type RS232	CA9-DH3000- PFA01  Pro-face  Gateway  *	HMI-CAB-ST52  or HMI-CAB-ST52- 30x  or HMI-CAB-ST52- 50x	A	
	CHB RS232	Your own cable	B	

A) When using the RS232 cable (HMI-CAB-ST52) by Pro-face America





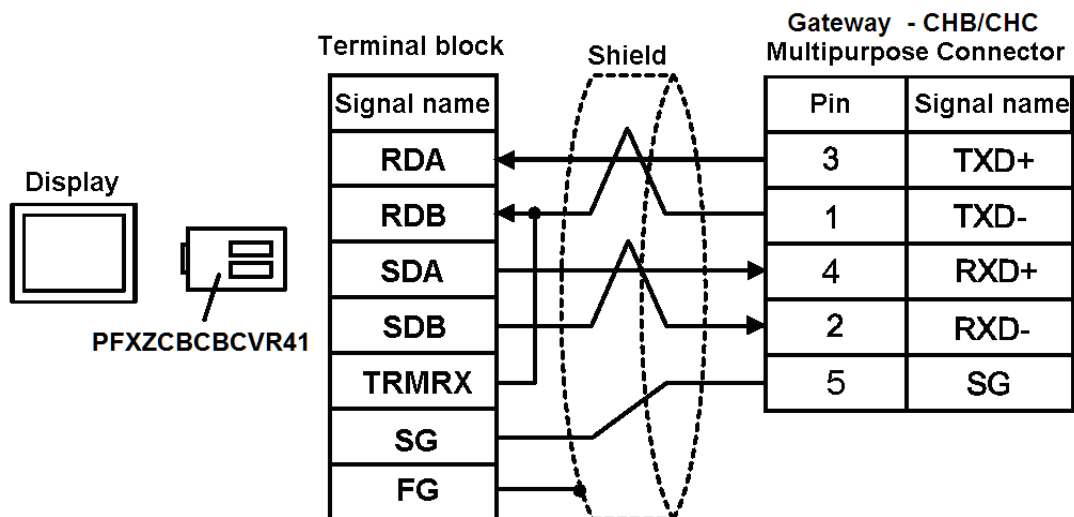
B) When using your own cable



**Cable Diagram 2**

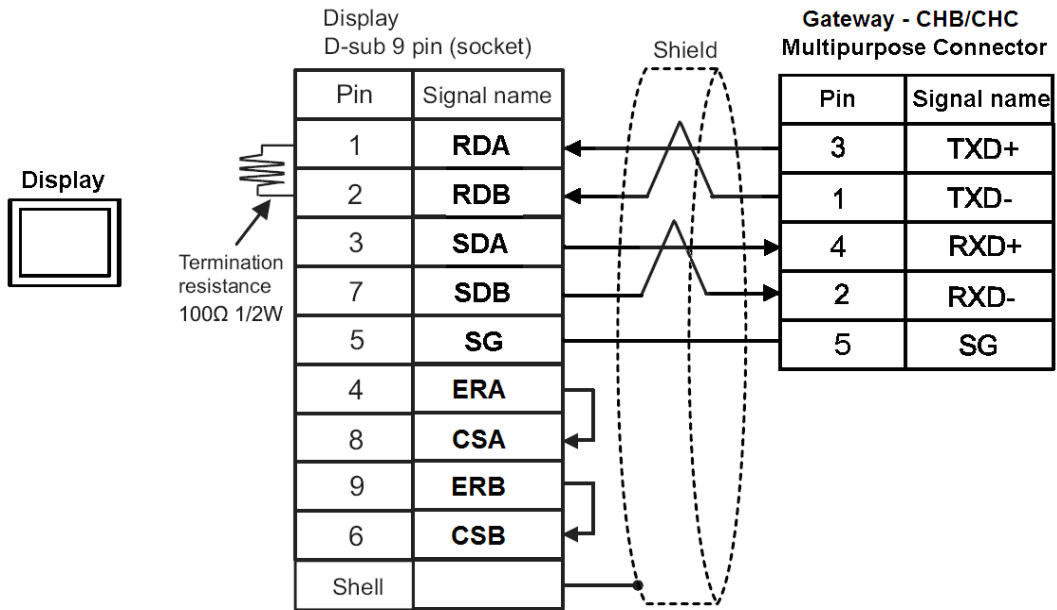
Display (Connection Port)	PLC (Connection Port)	Cable	Diagram	Remarks
AGP (COM1) <sup>1</sup> LT3300 AGP3302B (COM2) AST (COM2) <sup>2</sup> GP4000M (COM1) GP4000 (COM2) <sup>3</sup>  SIO Type RS422 4-wire	CA9-DH3000-A01 Pro-face Gateway *  CHB/CHC Multipurpose Port	Terminal block conversion adapter PFXZCBCBCVR41 + Your own cable	C	
		Your own cable	D	
AGP (COM2) <sup>1</sup>  SIO Type RS422 4-wire	CA9-DH3000-FA01 Pro-face Gateway *  CHB/CHC Multipurpose Port	Terminal block conversion adapter CA3-ADPTERM-01 + Your own cable	E	
		Your own cable	F	

- When using the terminal adapter and your own the RS422 cable to AGP (COM1)<sup>1</sup>, LT3300, GP4000 (COM2)<sup>3</sup>, AGP3302B (COM2), or AST (COM2) <sup>2</sup>.

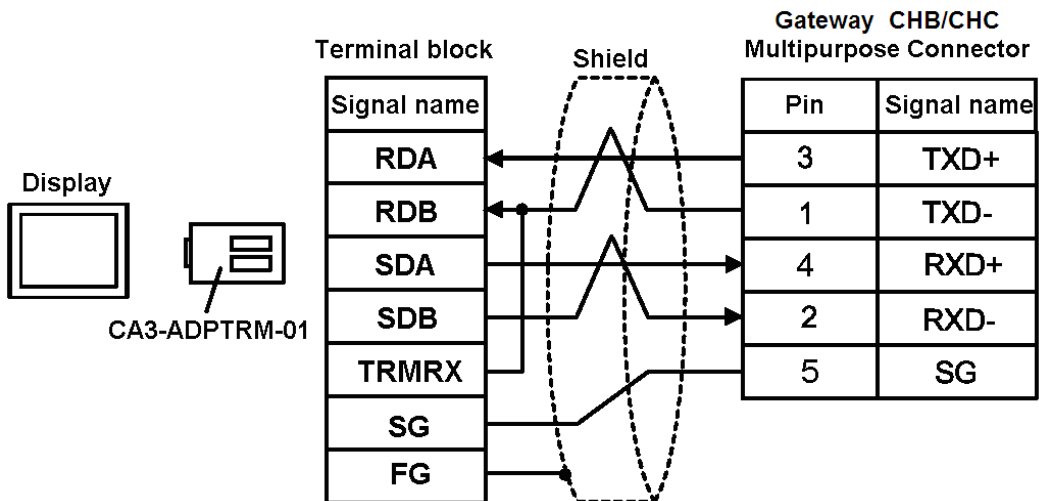


\*1 All AGP models except AGP-3302B  
 \*2 All AST models except AST-3211B  
 \*3 All GP4000 except GP4x03

C) When using your own the RS422 cable to AGP (COM1)<sup>1</sup>, LT3300, GP4000 (COM2)<sup>3</sup>, AGP3302B (COM2), or AST (COM2)<sup>2</sup>.



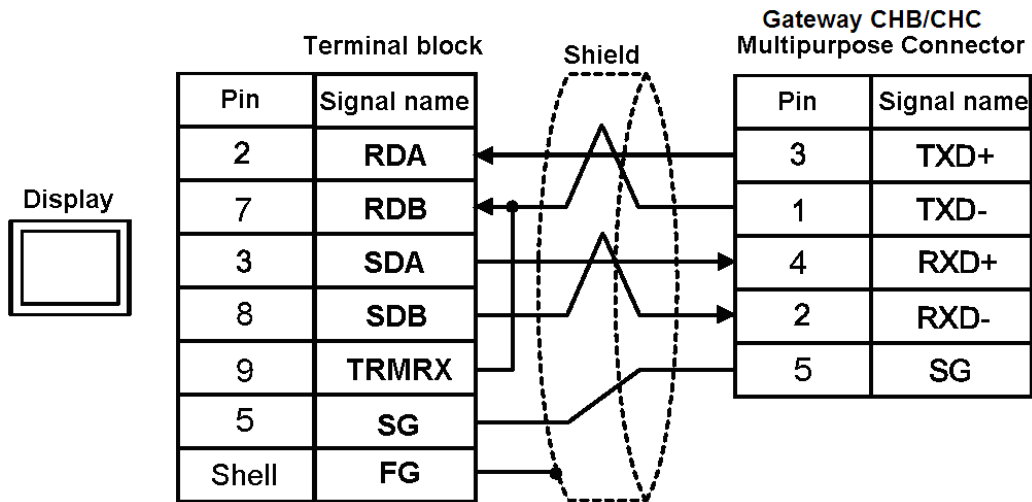
D) When using the terminal adapter and your own the RS422 cable to AGP (COM2)<sup>1</sup>.



\*1 All AGP models except AGP-3302B

\*2 All AST models except AST-3211B

E) When using your own the RS422 cable to AGP (COM2)<sup>1</sup>.



\*1 All AGP models except AGP-3302B

## 6 Supported Device

Refer to the Pro-face PLC/Device connection manual “Rockwell Automation DF1 Driver “ Section 6

## 7 Device Code and Address Code

Refer to the Pro-face PLC/Device connection manual “Rockwell Automation DF1 Driver “ Section 7

## 8 Error Messages

Refer to the Pro-face PLC/Device connection manual “Rockwell Automation DF1 Driver “ Section 8

For more information on Pro-face and our full line of HMI, Operator Interface and Industrial PC products please visit our web site at [www.profaceamerica.com](http://www.profaceamerica.com).

For technical support email: [support@profaceamerica.com](mailto:support@profaceamerica.com) or call: 800.289.9266.

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