

Pro-face

GP Series

GP377-PF21 (Profibus-DP Slave I/F Unit)



User's Manual

Pro-face HMI B.V.

Table of Contents

Table of Contents	2
Essential Safety Precautions	3
Note on CE Marking	3
Package Contents	3
Chapter 1 – Introduction	
GP377-PF21 Unit Specifications	4
External Dimensions	8
Component Names and Functions	9
Installation	10
Chapter 2 – Operation	
Connectable GPs	11
Cable Diagram	12
Configuration as a Profibus-DP Slave	13
Chapter 3 – Diagnostics	
Error Diagnostics	14

Essential Safety Precautions

This manual includes procedures that must be followed to operate the GP377-PF21 Unit and GP correctly and safely. Be sure to read this manual and any related materials thoroughly to understand the correct operation and functions of the GP377-PF21 Unit and GP.

- To prevent Internal Damage or Malfunction of the GP377-PF21 Unit:
 - Be sure to use the GP377-PF21 Unit only within its designated operating temperature range. Operating the GP377-PF21 Unit outside this range can lead to breakdown or malfunction.
 - Be sure that water, liquids or metal particles do not enter the GP377-PF21 Unit, since it may cause the unit to malfunction, or can lead to an electric shock.
 - DO NOT store the GP377-PF21 Unit in a place where it will be exposed to direct sunlight, high temperatures, excessive dust or vibration.
 - The GP377-PF21 Unit is a high precision piece of equipment. DO NOT subject it to excessive shocks.
 - DO NOT store the GP377-PF21 Unit near chemicals, or where chemicals can come into contact with the unit.

CE Marking

The GP377-PF21 is a CE marked product that conforms to EMC directives EN55011 class A and EN61000-6-2 .

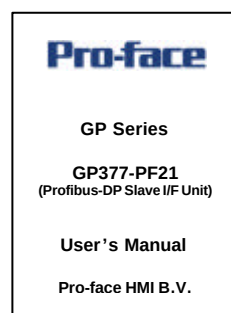
Package Contents

The GP377-PF21 Unit's packing box contains the items listed below. Please check to confirm that all the items shown below have been included.

GP377-PF21
(Profibus-DP Slave I/F)



GP377-PF21
User's Manual



This unit has been carefully packed, with special attention to quality. However, should you find anything damaged or missing, please contact your local GP distributor immediately for prompt service.

Chapter 1 – Introduction

1.1 GP377-PF21 Unit Specifications

1.1.1 General Specifications

When used with the models GP270-LG/SC21-24VP, GP370-LG/SC41-24VP, GP377*-LG/SC/TC41-24V & GP37W2-BG41-24V:

	GP27*/37* + GP377-PF21
Rated Voltage	DC24V
Power Supply	DC20.4V ~ DC27.6V
Power Consumption	20W (Max.)
Voltage Endurance	AC1000V 10mA for 1 minute (between charging and FG terminals)
Insulation Resistance	DC500V 10MΩ or higher (between charging and FG terminals)

When used with the models GP477R-EG41-24VP & GP577R-TC/SC41-24VP:

	GP477*/577* + GLC300-BCB41 + GP377-PF21
Rated Voltage	DC24V
Power Supply	DC20.4V ~ DC27.6V
Power Consumption	50W (Max.)
Voltage Endurance	AC1000V 10mA for 1 minute (between charging and FG terminals)
Insulation Resistance	DC500V 10MΩ or higher (between charging and FG terminals)

Note: When using the GP377-PF21 unit with a GP477/577 type the bus converter module GLC300-BCB41 is required.

1.1.2 Environmental Specifications

When used with the models GP270-LG/SC21-24VP, GP370-LG/SC41-24VP, GP377*-LG/SC/TC41-24V & GP37W2-BG41-24V:

	GP27*/37* + GP377-PF21
Ambient Operating Temperature	0 °C to 50 °C (0 °C to 40 °C for GP377R-TC41)
Ambient Storage Temperature	-20 °C to 60 °C (-10°C to 60 °C for GP377R-TC41)
Operating Humidity	20%RH to 85%RH (no condensation)
Operating Atmosphere	Must be free of corrosive gasses
Grounding	100Ω or less grounding resistance

When used with the models GP477R-EG41-24VP & GP577R-TC/SC41-24VP:

	GP477*/577* + GLC300-BCB41 + GP377-PF21
Ambient Operating Temperature	0 °C to 40 °C (0 °C to 50 °C for GP477R-EG41)
Ambient Storage Temperature	-10 °C to 60 °C
Operating Humidity	30%RH to 85%RH non-condensing
Operating Atmosphere	Must be free of corrosive gasses
Grounding	100Ω or less grounding resistance

Note: When using the GP377-PF21 unit with a GP477/577 type the bus converter module GLC300-BCB41 is required.

1.1.3 External Specifications

GP377-PF21 Module Only:

	GP377-PF21
External Dimensions	110.9mm (W) x 119.4mm (H) x 20.0mm (D)
Weight	180g or less
Attachment Method	Attached to the back of GP

GP377-PF21 Module + GP Main Unit:

	GP377-PF21 + GP270-LG/SC21	GP377-PF21 + GP370-LG/SC41	GP377-PF21 + GP377-LG/SC/TC41	GP377-PF21 + GP37W2-BG41
External Dimensions	172mm (W) x 127mm (H) x 78 mm (D)	171mm (W) x 138mm (H) x 77 mm (D)	171mm (W) x 138mm (H) x 77 mm (D)	207mm (W) x 157mm (H) x 78 mm (D)
Weight	980g or less	1080g or less	1130g or less	1280g or less
Attachment Method	Mounted in a solid enclosure			
Cooling Method	Natural Air Circulation			

	GP377-PF21 + GLC300-BCB41 GP477R-EG41-24VP	GP377-PF21 + GLC300-BCB41 GP577R-TC/SC41-24VP
External Dimensions	274mm (W) x 216mm (H) x 85 mm (D)	317mm (W) x 243mm (H) x 113.5 mm (D)
Weight	3000g or less	4000g or less
Attachment Method	Mounted in a solid enclosure	
Cooling Method	Natural Air Circulation	

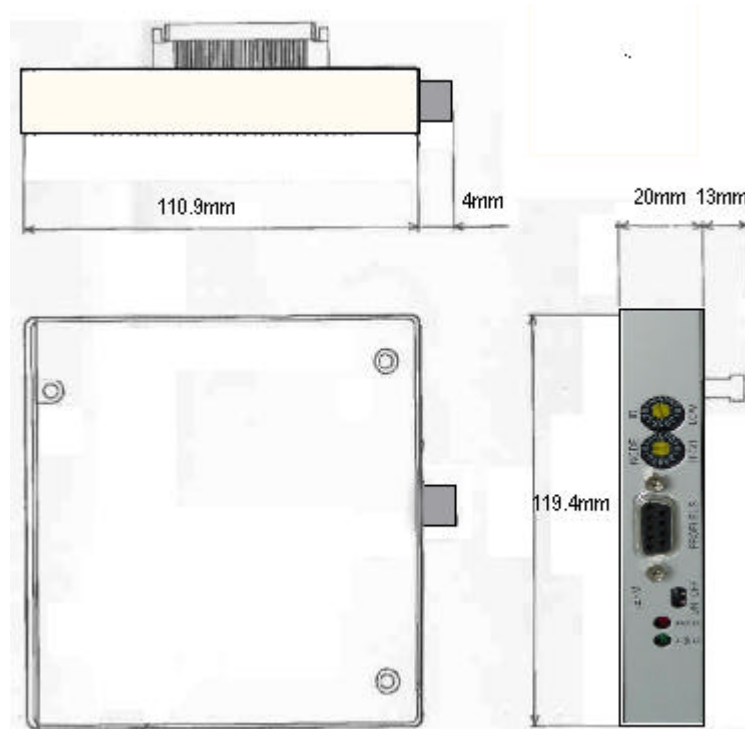
Note: When using the GP377-PF21 unit with a GP477/577 type the bus converter module GLC300-BCB41 is required.

1.1.4 Profibus-DP Specifications

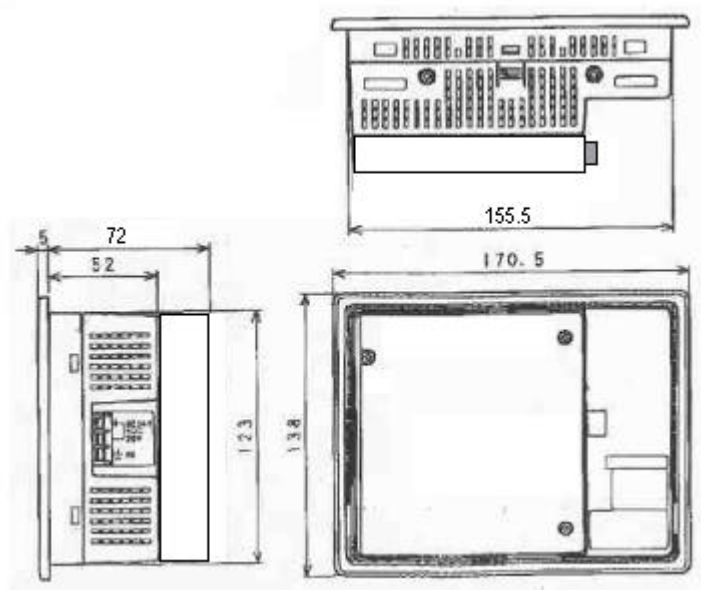
	GP377-PF21
Protocol	PROFIBUS EN50170 & DIN 19245 Part 1
Medium	EIA RS485 twisted pair cable
Cable Type	Wire Gauge: 0.64mm Conductor Area: > 0.34mm ²
Supported Baud Rates	9.6, 19.2, 93.75, 187.5, 500, 1500, 12000 kbit/s
Length of Cable*	1200m @ 9.6 ~ 93.75 kbit/s extendible with repeaters 1000m @ 187.5 kbit/s extendible with repeaters 400m @ 500 kbit/s extendible with repeaters 200m @ 1.5 Mbit/s extendible with repeaters 100m @ 12 Mbit/s extendible with repeaters * Valid for the Cable Type as specified above
Number of Nodes	32 Max in one segment, 127 possible with repeaters (Including Master)
I/O per Slave	128 Bytes Input Max (= 64 Words Max) 128 Bytes Output Max (= 64 Words Max)

1.2 External Dimensions

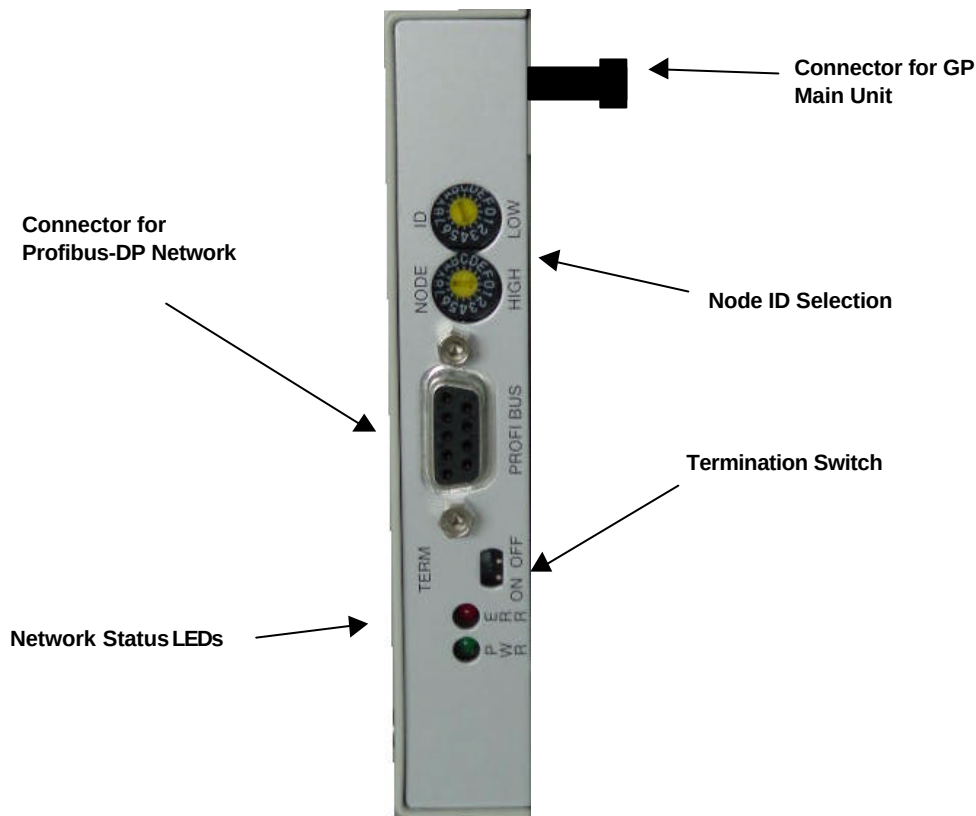
The GP377-PF21 Unit's external dimensions are as follows:
(Unit: mm)



The following diagrams show the GP377-PF21 Unit attached to a GP:
(Unit: mm)



1.3 Component Names and Functions



Notes:

NODE ID: This is coded in Hexadecimal, e.g. GP as slave No.1 => 01 (HIGH:0, LOW:1), GP as slave No.31 => 1F (HIGH:1, LOW:F).

TERM: The first and last nodes on the Profibus-DP network should have their termination switched on. Many Profibus-DP connectors have a built-in TERM switch, then the GP377-PF21 TERM should be switched to the OFF position.

PWR led: Module Power indicator (see diagnostic section)

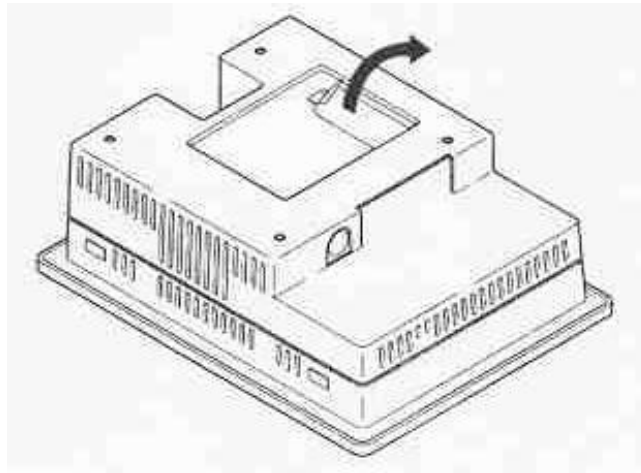
ERR led: Network Error Status indicator (see diagnostic section)

1.4 Installation

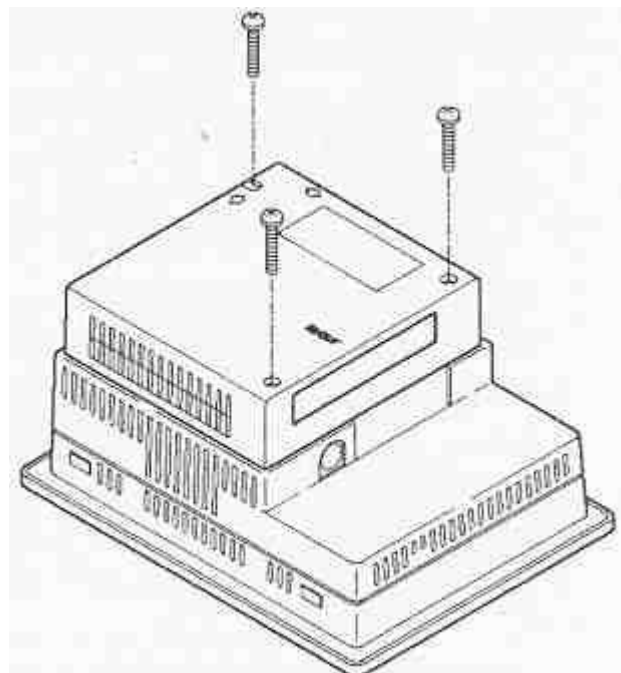
WARNING: Prior to installing the GP377-PF21 Unit, be sure to check that the GP's power is OFF. Otherwise, it can cause an electric shock.

These instructions are for installation on a "Medium" Sized GP, for "Large" Size GPs the bus converter module GLC300-BCB41 is required. Please see the documentation for the bus converter module for installation instructions.

1. Peel off the GP unit's expansion connector seal. Prior to attaching the GP377-PF21 Unit to the GP, be sure to connect the GP's power cord to the GP unit. The power cord cannot be attached to the GP after the GP377-PF21 Unit has been installed.



2. Secure the GP377-PF21 Unit in place with its three (3) attachment screws (see figure). A torque of only 0.5 to 0.6 Nm is needed.



Chapter 2 – Operation

2.1 Connectable GPs

2.1.1 Connectable “Medium” Size GPs:

GP270-LG21-24V
GP270-SC21-24V
GP370-LG41-24VP
GP370-SC41-24VP
GP377-LG41-24VP
GP377-SC41-24VP
GP377R-TC41-24VP
GP37W2-BG41-24VP



Note: GP377-PF21 Connects directly to the back of the bus connector on the GP

2.1.2 Connectable “Large” Size GPs:

GP477R-EG41-24VP
GP577R-TC41-24VP
GP577R-SC41-24VP

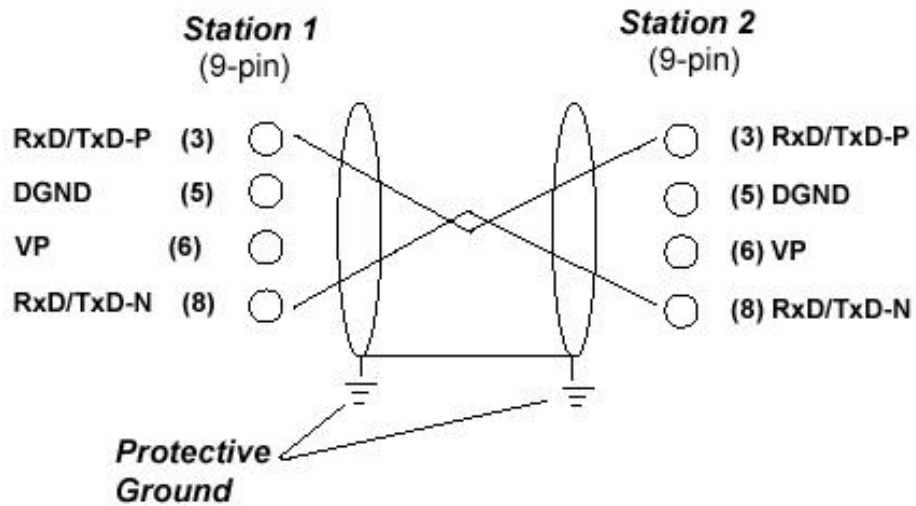


Note: For connection of the GP377-PF21 to a “Large” size GP the bus convert module GLC300-BCB41 is required. Please see the Bus Converter documentation for installation instructions.

2.2 Cable Diagram

2.2.1 Cable Diagram:

The GP377-PF21 Profibus-DP Slave units are connected via RS485 2-Line connections. Please use the cable type as recommended in section 1.1.4. Below is an example of wiring between two Profibus-DP Nodes.



2.3 Configuration as a Profibus-DP Slave

2.3.1 Introduction to Profibus-DP:

Profibus-DP is a field bus network for control of remote I/O by a master (typically a PLC). The master on the Profibus-DP network reads input and writes output data to all the slaves on the network. The GP377-PF21 Unit is a Profibus-DP Slave. It enables a GP to connect to a Profibus-DP network as a slave hence it is treated by the Profibus-DP master as remote I/O.

2.3.2 Profibus-DP Master Configuration:

Each slave on the Profibus-DP network has to be entered into the Profibus-DP master's configuration. Here is defined the Input and Output size that the slave will occupy and the Node ID for the slave. For this purpose each slave requires a unique "GSD" file. This is an electronic description of the slave device. The GP377-PF21 has a GSD file also. The name is: GPE12982.GSD. This file can be found in the GP-PRO/PBIII for Windows European Software v5.0 or later, otherwise please contact your local Pro-face Supplier.

2.3.3 GP Configuration:

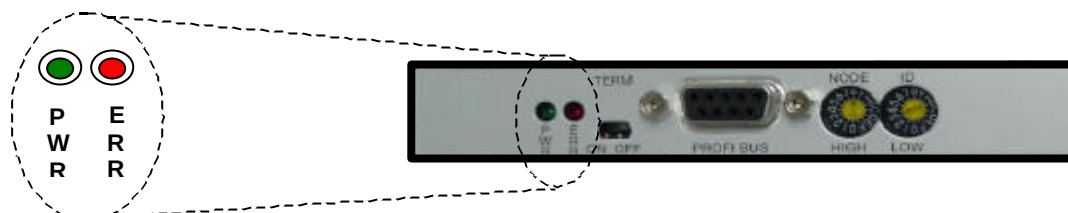
The Node ID has to be set on the GP377-PF21 module. This should be set to match the Node ID assigned to it by the Profibus-DP master. Please note that the Node ID on the GP377-PF21 is represented in Hexadecimal. Only the range 01h ~ 7Eh (1~126 decimal) are valid.

The Input & Output area size on the GP have also to match what was assigned by the Profibus-DP master. These have to be configured using the GP-PRO/PBIII for Windows Software. Please see the "PLC Connection Manual" and the documentation on the CD-ROM for instructions.

Chapter 3 – Diagnostics

3.1 Error Diagnostics

3.1.1 Status LEDs:



PWR LED Status	ERR LED Status	Error	Cause & Remedy
OFF	OFF	No Power to the Profibus Module.	1. Module not connected properly to the bus connector on the GP. Please check that the mounting screws are fixed firmly. 2. Module damaged. Contact your Pro-face dealer. 3. GP damaged. Contact your Pro-face dealer.
ON (Green)	ON (Red)	Profibus-DP Network Error.	1. Profibus-DP Master configuration not present. Verify that the GP slave with the error has been entered in the master's configuration and that the correct GSD file has been used. 2. Node ID incorrect. Set the Node ID on the module to match the master's configuration. 3. Cable Error. Verify that the cable is connected properly to the GP unit and the wiring is correct. 4. I/O Size Error. Verify that the GP's I/O size matches with that configured by the master. 5. Termination incorrect. Verify that the termination is only ON for the first and last nodes. If the bus connectors have a termination switch then turn the termination OFF for all GPs.
ON (Green)	OFF	No Error	Module and Profibus-DP network configuration are OK !

3.1.2 GP Error Codes:

Error Code	Error Description	Cause & Remedy
02:14	Interface Module Hardware Error	1. Interface module incorrect type. Please replace. 2. Interface module not connected. Securely mount the module with the 3 mounting screws. 3. Interface module damaged. Contact your Pro-face supplier.
02:FF	Data Send Timeout	1. GP unable to send data. Check that the cables are connected correctly and that the master is running.
02:FE	Date Receive Timeout	1. Cable error. Check Cable is correct and connected correctly. 2. PLC in stop mode. Data cannot be received by the GP while the PLC is in stop mode. 3. Profibus-DP network not active. 4. Interpreter function block (FB99) not present or not called in PACKET TRANSFER mode. Check PLC program.
02:FC	Protocol Error	1. Illegal Data Received by the GP in PACKET TRANSFER mode. Check the PLC program and for bad cables or noise on the bus.
02:FD	Data Error	1. Illegal Data Received by the GP in PACKET TRANSFER mode. Check the PLC program and for bad cables or noise on the bus.
02:FA	Address out of range error	1. Illegal address being accessed by GP. Check that the address type exists and that the range is supported by the PLC

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