IC693PTM100/101 Power Transducer (PTM)– Preliminary

Note

This information was preliminary at the time of writing and could change by the time the product is released. The PTM is expected to be available early in the year 2000. Please contact your distributor for up-to-date information.

The PTM is used for measuring electrical power consumption or for monitoring voltages between an electrical generator and its power grid. It connects to user-supplied current and potential transformers, which furnish the input signals the PTM uses to calculate its data. Since one of the PTM's components is a Series 90-30 PLC module, the PLC can use the data gathered by the PTM for data reporting, fault monitoring, generator control, or demand charge reduction / load shedding applications. The PTM consists of three parts, which are all included under one catalog number:

- **PTM Processing Module (PTMPM)** – a module that mounts in a Series 90-30 Rack.
- **PTM Interface Module (PTMIM) –** a panel-mounted circuit board. This board interfaces between the PTMPM module and the input transformers (current and potential).
- **Interface cable** – connects the PTMPM module to the PTMIM circuit board.

Difference Between PTM100 and PTM101

The only difference between the IC693PTM100 and IC693PTM101 is in the length of their interface cables. The PTM100 comes with a 19" (0.5 meter) cable, and the PTM101 comes with a 39" (1 meter) cable.

Capabilities

A single PTM is capable of performing any one of the following tasks, as selected by the appropriate %Q bit:

- Measure power parameters for three individual single phase circuits.
- Measure power parameters for one 3-wire single phase circuit (120 / 240 VAC).
- Measure power parameters for one 3-phase circuit (selectable between Wye or Delta type).
- Measure and compare power parameters between a 3-phase generator's output phases and one power grid phase.
- Measure and compare power parameters between one generator output phase and one power grid phase.

Operating Modes

The PTM can operate in either of the following two modes, which are selectable by a %Q bit in the user's PLC application program:

- **Power Monitor Mode** – In this mode, the PTM samples either Single Phase or 3-Phase AC voltages and currents and uses the data to calculate numerous power values. For 3-Phase operation, Wye or Delta, can be selected.
- **Synchro Monitor Mode** – In this mode, the PTM samples a Single-Phase or 3-Phase AC voltage produced by a generator, and one voltage from the associated power grid, then develops voltage, frequency, and relative phase information.

Automatic Data Transfers Between PTMPM and PLC

The PLC CPU controls the PTM Processor Module (PTMPM) by sending it several %Q bits and %AQ words during each PLC sweep. These %Q bits and %AQ words represent commands such as Enabled / Disabled, Power / Synchro Mode, Display Mode, and Gain values.

In return, the PTMPM provides information to the PLC CPU by sending it several %I bits and %AI words each PLC sweep. The information sent by the PTMPM includes voltage, current, power, and phase values, as well as discrete fault status.

Compatibility

The PTM is compatible with all Series 90-30 CPUs, and the PTMPM module may be mounted in any type of baseplate (CPU, Expansion, Remote).

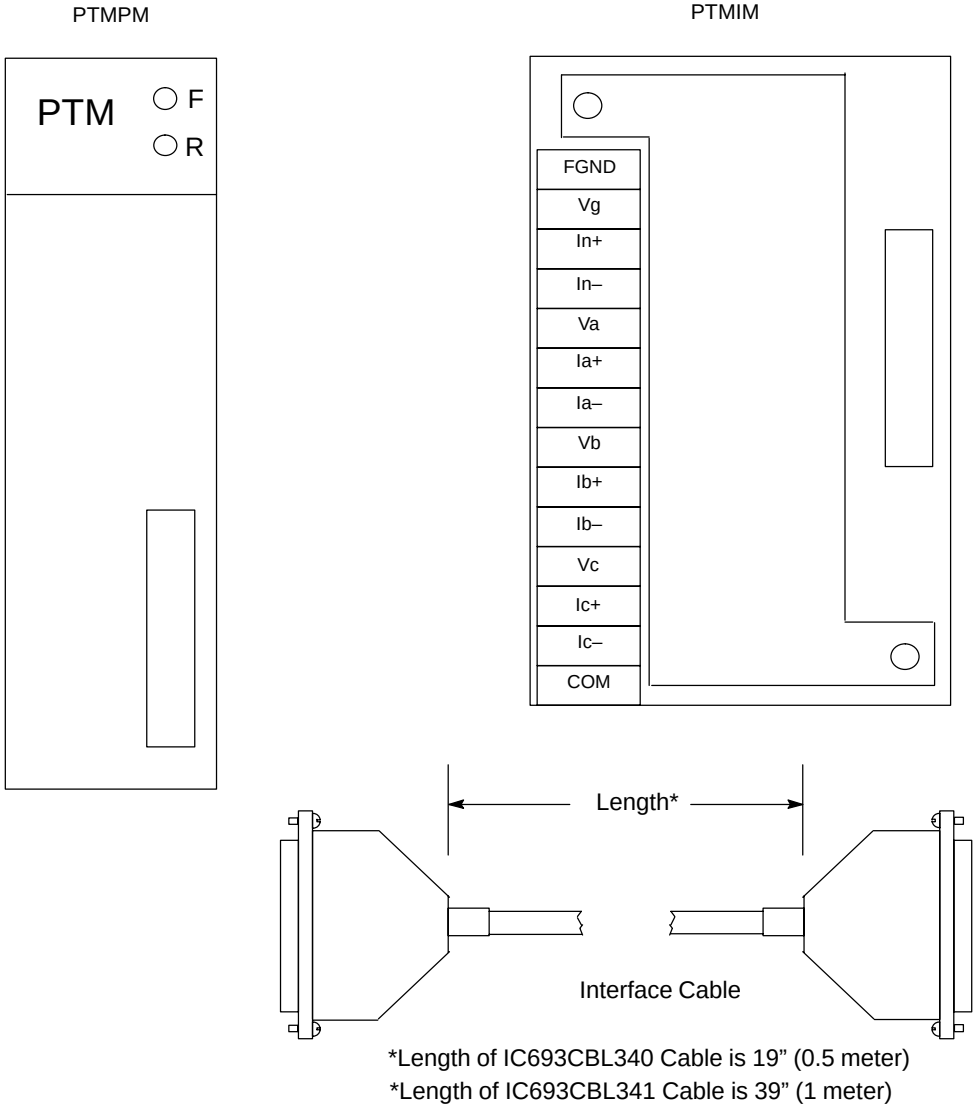

Figure 8-23. IC693PTM100/101 Components

Dimensions

- **PTMPM** – Standard size Series 90-30 module, mounts in a Series 90-30 baseplate.
- **PTMIM** – Interface module. Approximately 4.5" (114 mm) long by 3" (76 mm) wide. It is mounted on a standard 35 mm DIN-rail.
- **IC693CBL340 Interface cable** – Approximately 19" (0.5 Meter) long.
- **IC693CBL341 Interface cable** – Approximately 39" (1 Meter) long.

PTMPM Indicator LEDs

- **F (Fault)** – This RED LED, when OFF, indicates that there are no interface faults. When ON, either steady or flashing, it indicates that one or more of three possible faults is present: (1) Phase A input not present, (2) over-range condition on one or more inputs (voltage or current values too high), and (3) phase polarity fault. Each of these three fault signals has a %I status bit in the PLC.
- **R (Running)** – This Green LED, when ON, indicates that the module is "running" (functioning properly). When OFF, it indicates a module failure.

General Mounting Information

It is recommended the PTMPM modules be mounted in a slot at or near the end of the PLC and that the PTMIM be mounted to the panel to the side of the PLC (the PTMIM mounts on a standard DIN-rail). This will keep the power wiring to the PTMIM physically separated from PLC signal wiring, thus reducing the opportunity for noise coupling. **The PTMIM ground requirements must be strictly adhered to – refer to the user's manual (GFK-1734 when available in early 2000) for instructions. See Warning note below.**

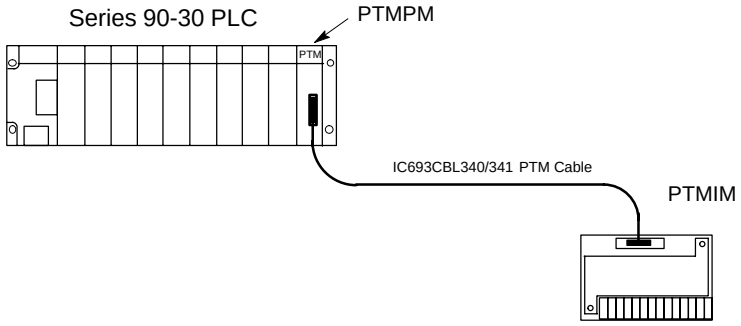

Figure 8-24. IC693PTM100/101 Component Mounting

Warning

The PTMIM board connects to hazardous voltages. Before installing, testing, or troubleshooting this board, you should read the complete instructions in the PTM User's Manual, GFK-1734 (see "Documentation" section below). Failure to follow the guidelines in the PTM User's Manual may result in personal injury, equipment damage, or both.

Baseplate Type and Allowable Number of PTMPM Modules

The PTMPM module may be installed in any type of Series 90-30 baseplate (CPU, Expansion, or Remote). There are no restrictions as to the maximum number of PTMPM modules per PLC system, or per PLC baseplate, as long as the PLC power supply has sufficient capacity and there is sufficient %I, %Q, %AI, and %AQ memory available. However, as noted in the "Mounting Information" section, it is beneficial to keep the PTMIM power wiring physically separated from PLC signal wiring in order to reduce noise coupling; this can have a bearing on which baseplate slots to choose when mounting PTMPM modules.

Power Supply Requirement

The PTMPM module requires 400 mA @ 5 VDC from the PLC power supply. The PTMIM does not require a control power input.

Memory Requirement

Each PTMPM requires the following PLC memory allocation:

- %I – 16 bits
- %Q – 16 bits
- %AI – 25 words
- %AQ – 2 words

Configuration

The PTMPM module should be configured in the Series 90-30 PLC as a "Foreign" module.

PTM Acronyms

- **PTM** Power Transducer. Consists of PTMPM, PTMIM, and interface cable.
- **PTMPM** Power Transducer Processor Module
- **PTMIM** Power Transducer Interface Module

Ordering Information

The PTMPM module and its PTMIM interface board are considered to be a matched set and, therefore, they are not sold separately. The two cables, however, may be ordered as separate items. There are four catalog numbers in the PTM product line:

- IC693PTM100 – This system contains the PTMPM, its matched PTMIM, and the 19" (0.5 meter) interface cable.
- IC693PTM101 – This system contains the PTMPM, its matched PTMIM, and the 39" (1 meter) interface cable.
- IC693CBL340 – The 19" (0.5 meter) interface cable.
- IC693CBL341 – The 39" (1 meter) interface cable.

Documentation

The user's manual will not be available until early in the year 2000. It will be GFK-1734, *Series 90-30 PLC Power Transducer User's Manual.*