Carrierband MAP Interface Module

The Carrierband MAP Interface module, IC697CMM721, is a member of the GEnet Family of products, which provide high performance solutions for interconnecting automation controllers and for integrating them into multi-vendor networks. The Series 90-70 MAP Interface module provides direct connection for a Series 90-70 PLC to an IEEE 802.4 carrierband network.

The GEnet Factory LAN architecture is based on standards set forth in the Manufacturing Automation Protocol (MAP) specification. MAP is the single networking scheme that allows all the vendors involved in automating a factory to work on a common communications architecture. The LAN Interface module supports the MAP specification version 3.0. The MAP protocol software is loaded into RAM on the LAN Interface module. This allows easy upgrade to a new revision of software without modification to the hardware.

Module Features

The features of the GEnet Factory MAP Interface module are described briefly here. For a more complete description, see the appropriate section in GFK-0869, the *MAP 3.0 Communications for the Series 90-70 PLC User's Manual.*

The Carrierband MAP Interface is a single-slot module composed of a factory assembled digital controller and modem. The entire LAN Interface occupies only a single slot in the Series 90-70 PLC rack. The following figure illustrates the LAN Interface module as part of the network.
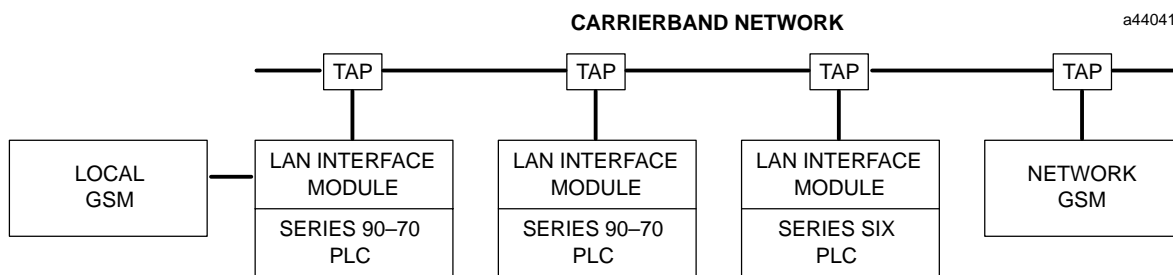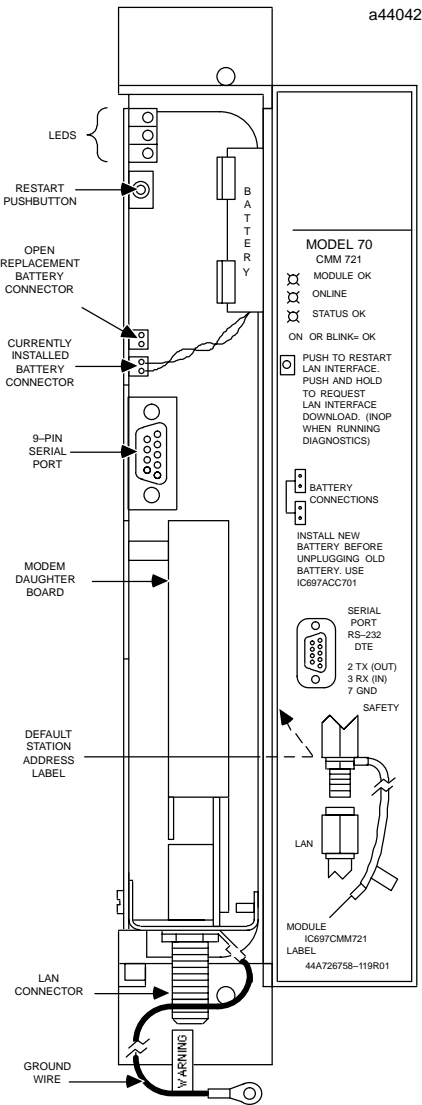

Figure 2-33. LAN Interface Module Connects the Series 90-70 PLC to a Carrierband Network

The LAN Interface connects the PLC directly to the carrierband network through the 5 Mbps modem daughter board on the module. Intermediate devices such as bridges or gateways are not required. The direct connection provides the high performance required for real-time control applications.

Communications software is downloaded to the LAN interface and stored in RAM. This makes it easy to upgrade the communications software simply by downloading it again rather than by physical replacement of ROM-chips. An on-board battery provides memory retention that prevents loss of the communication software due to power loss for at least six months.

a44042

LEDS

RESTART
PUSHBUTTON

OPEN
REPLACEMENT
BATTERY
CONNECTOR

CURRENTLY
INSTALLED
BATTERY
CONNECTOR

9–PIN
SERIAL
PORT

MODEM
DAUGHTER
BOARD

DEFAULT
STATION
ADDRESS
LABEL

LAN
CONNECTOR

GROUND
WIRE

BATTERY

MODEL 70
CMM 721

MODULE OK

ONLINE

STATUS OK

ON OR BLINK= OK

PUSH TO RESTART
LAN INTERFACE.
PUSH AND HOLD
TO REQUEST
LAN INTERFACE
DOWNLOAD. (INOP
WHEN RUNNING
DIAGNOSTICS)

BATTERY
CONNECTIONS

INSTALL NEW
BATTERY BEFORE
UNPLUGGING OLD
BATTERY. USE
IC697ACC701

SERIAL
PORT
RS–232
DTE

2 TX (OUT)
3 RX (IN)
7 GND

SAFETY

LAN

MODULE
IC697CMM721
LABEL
44A726758–119R01

WARNING

communication software that is downloaded to the board using the GEnet System Manager (GSM). A GSM is a separate computer running GSM software that is available from GE Fanuc Automation.

Module Status Indicators

The LAN Interface Module indicators consist of three LEDs, which are described in the following table:

Table 2-16. LAN Interface Module LED Indicators

Indicator	Status	Description
MODULE OK	ON	This LED is ON if the LAN Interface hardware has passed diagnostics and is operating properly.
	OFF	It is OFF if the module fails a diagnostics test or if a failure is detected while the board is running.
	BLINKING	This LED is blinking if the module is running diagnostics or in Soft Switch Entry state.
ONLINE	ON	This LED is ON when the LAN Interface is periodically receiving the right to transmit on the network.
	OFF	This LED is OFF when:
		- no other stations are connected and communicating on the network,
		- the network is not communicating due to a disruption of the cable,
		- the local station has malfunctioned, or,
		- the LAN Interface has been instructed <u>not</u> to enter the network.
	BLINKING	It is BLINKING when the module is transferring data on the network or loading over the network.
STATUS OK	ON	This LED is ON if the module is running without exception conditions.
	OFF	This LED is OFF if the module is running and detects an event that calls for supervisory attention. In this case, the user should connect the GSM and follow instructions in GFK-0869, to obtain further information.
	BLINKING	This LED is BLINKING if the module is loading or looking for a load source for the LAN Interface software.

Restart Button

The Restart Button serves two functions: Restart, and Reload and Restart. The Restart button is inaccessible when the hinged door to the LAN Interface module is closed.

Restart: Pressing the Restart button forces a restart of the LAN Interface module. When the button is pressed, all LEDs go out. When the button is released, power-up diagnostics are run and the software on the module is restarted.

Restart and Reload: Pressing and holding the Restart button until the STATUS OK LED comes ON forces a restart and reload of the LAN Interface module. When the button is pressed, all LEDs go OUT. After 3-4 seconds, the STATUS OK LED will turn ON, acknowledging the load request. When the button is released, power-up diagnostics run and the LAN Interface requests a download from the GSM.

Note

In either case, any data being transferred by the LAN Interface at the time of the Restart will be lost.

The Restart/Load pushbutton is not operable during the LAN Interface diagnostic phase. The LAN Interface is in diagnostic phase when the BOARD OK LED is BLINKING and the ONLINE and STATUS OK LEDs are OFF.

Battery

The battery/battery holder is located to the right of the LEDs. The battery connectors are located on the controller board between the Restart button and the 9-pin connector to the serial port.

Serial Port

A 9-pin serial port (RS-232C interface) on the LAN Interface module is used to connect the LAN Interface with the local GSM. The communication software may be loaded to the module through this port. The LAN Interface module is a Data Terminal Equipment (DTE) device.

A cable is needed to connect the GSM to the LAN Interface. The following figure shows how to construct this cable.
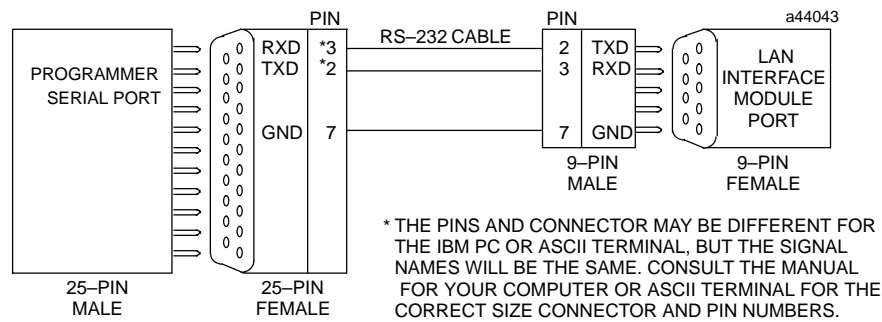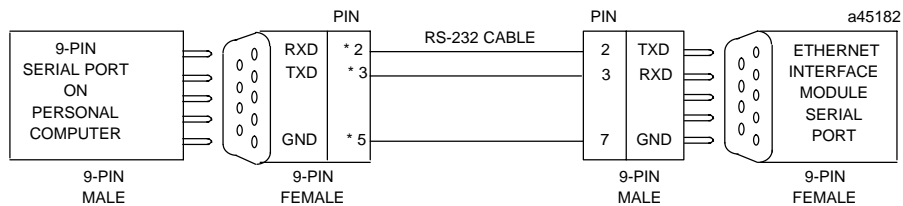

Figure 2-35. Serial Cable to Connect the GSM (25-Pin Connector) to the LAN Interface

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                                        PIN                             PIN                    a45182
  9-PIN                         RXD    * 2      RS-232 CABLE      2     TXD          ETHERNET
SERIAL PORT                     TXD    * 3                       3     RXD          INTERFACE
   ON                                                                              MODULE
 PERSONAL                                                                          SERIAL
 COMPUTER                       GND    * 5                       7     GND          PORT

  9-PIN                          9-PIN                          9-PIN               9-PIN
  MALE                          FEMALE                          MALE               FEMALE
```

* THE PINS AND CONNECTOR MAY BE DIFFERENT FOR SOME COMPUTERS OR TERMINALS, BUT
   THE SIGNAL NAMES WILL BE THE SAME. CONSULT THE MANUAL FOR YOUR COMPUTER OR ASCII
   TERMINAL FOR THE CORRECT SIZE AND PIN NUMBERS.

Figure 2-36. Serial Cable to Connect GSM (9–Pin Connector) to Ethernet Interface

Station Address Label

The default station (MAC) address label lists the station address to be used by this module, unless a locally assigned address is set by the user.

LAN Connector

The LAN Interface module is connected to the network through the coaxial LAN connector. The LAN connector, for attaching the drop cable of the LAN cable plant, is mounted and positioned downward on the lower front edge of the LAN Interface module.

Caution

The LAN connector and LAN Interface module may be damaged if components other than the recommended cable plant components are used. Such damage is not covered by the LAN Interface module equipment warranty. Refer to GFK-0014 (*GEnet Factory LAN Carrier Band Cable Plant Design and Installation Manual*) or contact your local GE Fanuc Automation sales office for further information.

Safety Ground Wire

The safety ground wire grounds the modem and coaxial cable shield to the chassis of the Series 90-70 PLC rack.

Warning

The ground wire must be securely fastened to the chassis of the Series 90-70 PLC rack and the rack must be properly grounded. Failure to do so may cause personal injury or improper operation of the equipment.

Ethernet Controller

The Series 90-70 Ethernet Controller, IC697CMM741, is a member of the GEnet family of products. The Ethernet Controller plugs into a single slot in a Series 90-70 PLC rack, providing an 802.3-standard 15-pin D-connector for attachment of a user-supplied AUI (or transceiver) cable. The AUI cable connects to a user-supplied transceiver that is directly connected to the Ethernet trunk cable. The transceiver must be 802.3 compatible and must have the SQE option enabled. Transceivers are available to operate on a variety of media including thickwire coaxial cable (10Base5) and ThinWire ™ coaxial cable (10Base2).

The Ethernet Controller is designed so the communications protocols which operate above the Ethernet data link layer are implemented in software. This allows you to choose one of two alternative communication protocols by downloading the Ethernet LAN Interface with the applicable communications software. The communications protocols are:

- **TCP/IP-Ethernet Communications Software** - Communicate with host computers and/or Programmer using proprietary SRTP over a 4-layer TCP/IP (Internet) protocol stack; requires either a Local or Network Factory LAN System Manager (GSM) for configuration and downloading of Ethernet Controller software. For detailed information on TCP/IP Ethernet communications, refer to GFK-1004, *TCP/IP Ethernet Communications for the Series 90-70 PLC User's Manual*

- **MMS-Ethernet Communications Software** - Communicate with host computers and/or Programmer using MMS (Manufacturing Message Specification - ISO 9506) on a 7-layer OSI protocol stack; requires GSM for configuration and downloading of Ethernet Controller software. For detailed information on MMS-Ethernet communications, refer to GFK-0868, the *MMS-Ethernet Communications for the Series 90-70 PLC User's Manual.*

Note

A third option, SRTP Communications Software, supports only communications with Programmer using SRTP over a 4-layer OSI protocol stack; this Ethernet Controller software does not require configuration and can be downloaded directly from the programmer.

The Ethernet Controller provides basic functions in firmware or ROM. This firmware includes self-test diagnostics and special software that allows you to configure and test your interface in the PLC and on the Ethernet LAN. It also allows you to load the communications software into RAM either from the GSM (serially or over the network), or from an IC641 OSI-Ethernet Programmerstation.

The communications software is stored in RAM so you can upgrade communications software without replacing ROM chips. The battery maintains the contents of RAM in case of power outages. The following figure shows the relationship between the MMS-Ethernet Controller and the Local and Remote GSMs.