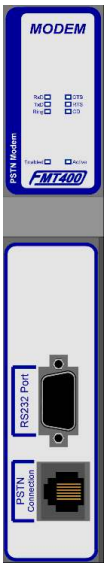


Provides the FMT-400 with a MODEM for connection to a PSTN.
Allows remote programming of FMT-400
Allows FMT-400 to act as a remote node in a SCADA system

Introduction

The 400-MODEM module provides the FMT-400 system with means to communicate with remote equipment over the PSTN. For instance the FMT-400 could be a remote node in a SCADA network. The 400-MODEM module also gives the user the option to program the FMT-400 using Flex32 over the PSTN. A maximum of two 400-MODEM modules are supported by the 400-CPU-A, four by the 400-CPU-B and eight by the 400-CPU-C. The 400-MODEM module must be used in the main rack of the FMT-400 system.
In addition the 400-MODEM module requires that it must be connected to one RS232 port in the FMT-400 system, if it is intended that the 400-MODEM is to be used for remote programming of the FMT-400 system then it must be connected to PORT 0 on the CPU module. Call control is provided using the Hayes AT Command Set operating over the Public Switched Telephone Network (PSTN).

General Specifications

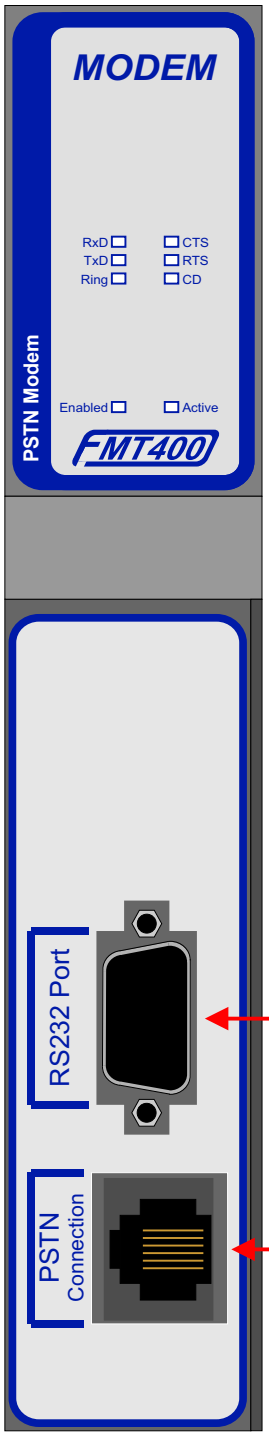
Storage temperature	-20 to +70 ˚C
Operating temperature	0 to 55 ˚C
Humidity	10-90% non condensing
Weight	500g approx
Dimensions	Standard FMT-400 size single width module
Current consumed from rack	TBAmA from rack power supply
Maximum Baudrate	CPU Module dependent, maximum data transmisson rate over the PSTN is 33600bps. However because the Modem can buffer some data, faster baudrates may be used by the FMT-400
RS232 Port Protection	+/- 15KV ESD protected
Hayes AT Command Set Compatible	AT+++, A, D, E, H, Q, Sn, ?, Sn=x, V, X, Z. Etc.

FMT-400 400-MODEM Modem Module

Colter Group

Connection Details

Connections should be made to the 400-MODEM connectors as shown in the following diagrams.
The RS232 connectors are 9-way female D-type connectors (pin out listed below).
The PSTN connection is a standard RJ11 connector.



RS232 Connector

PSTN RJ11 Connector

RS232 Port Pin Assignments

Pin No	Port A	I/O
1	Protective Earth	-
2	RxD	O
3	TxD	I
4	N/C	-
5	N/C	-
6	N/C	-
7	Common	-
8	N/C	-
9	N/C	-

Important Note:
RxD in this context means data that is **received** by the 400-MODEM from the PSTN and is then **transmitted** from pin 2 of the RS232 port on the modem.
TxD in this context means data that is **transmitted** by the 400-MODEM to the PSTN and is therefore data **received** on pin 3 of the RS232 port on the modem.

LED Descriptions

Label	Colour	Description
RxD	Green	Flashes when data is received from the PSTN by the 400-MODEM (at high data rate this LED may appear to be constantly illuminated).
TxD	Red	Flashes when data is sent down the PSTN from the 400-MODEM (at high data rate this LED may appear to be constantly illuminated).
Ring	Yellow	Flashes when the 400-MODEM is being rung by another Modem.
CTS	Yellow	Indicates status of the internal 'Clear to Send' function within the 400-MODEM. When illuminated the CTS function is ready and data can be received by the 400-MODEM from the PSTN.*
RTS	Yellow	Indicates the status of the internal 'Request to Send' function within the 400-MODEM. When illuminated the RTS function is ready and data can be transmitted by the 400-MODEM to the PSTN.*
CD	Yellow	Indicates 'Carrier Detect'. After dialing and handshaking, the 400-MODEM determines if a telephone line connection exists by detecting the carrier signal from the other modem. If the carrier is not detected for a long enough period of time then the 400-MODEMassumes the telephone line connection with the other modem has been broken. The CD Led is illuminated when the 400-MODEM detects a carrier.
Enabled	Yellow	When illuminated shows that the module has been correctly set up within your project in Flex32 and that the CPU module has initialised the module. If not illuminated then the module may not have been set up in your project configuration.
Active	Yellow	Indicates activity within the module, this will normally flicker or appear to be constantly illuminated, activity occurs when the 400-MODEM is sending data to or receiving data from another Modem and / or the 400-CPU-X that it is connected to.

*Note: The CTS and RTS LEDS are normally always on. If they are not then the 400-MODEM may be initialising itself, it may not have been enabled or there may be an internal fault within the 400-MODEM. There are no external CTS and RTS connections on the 400-MODEM.

Using the 400-MODEM

For most purposes the 400-MODEM is transparent in use. The 400-MODEM must be connected to the RS232 port within the FMT-400 system which you intend to use for remote communications over the PSTN. If you intend to remotely program a FMT-400 system using Flex32 over the PSTN then the 400-MODEM MUST be connected to Port 0 on the CPU within the FMT-400 system.

The port to be used should have the following parameters set up

- Baudrate
- Number of data bits
- Parity
- Number of stop bits
- Station number (if applicable)
- Communications Protocol
- Configure Modem check box ticked, if required. Please see Note.

Note: Tick the Configure Modem check box only if you require the CPU in the FMT-400 system to automatically configure the 400-MODEM for you upon power up of the system (the 400-MODEM to 400-CPU lead must be connected). If you would like to configure the 400-MODEM's parameters yourself then leave this box unticked. However you must ensure that your user program sends out a text string containing configuration information for the 400-MODEM before the program attempts to use the 400-MODEM for any communications.

Using the 400-MODEM (continued)

When communicating with remote equipment over the PSTN network the 400-MODEM will appear transparent when using 'User Code' communications. When you require to send or receive data from a remote system simply use the RS232 port that the 400-MODEM is connected to as normal.

If the FMT-400 is connected to a remote SCADA system over the PSTN then you will probably select 'Modbus RTU slave' as the communications protocol you wish to use. The FMT-400 will then operate as a Modbus slave.

User configuration of the 400-MODEM

If you wish to configure the 400-MODEM's parameters yourself then leave this box unticked. However you must ensure that your user program sends out a text string containing configuration information for the 400-MODEM before the program attempts to use the 400-MODEM for any communications. Data that is typically contained in the configuration string that is sent to the 400-MODEM is shown below.

AT E0 &Q5 &K0 <CR>

Please also see the separate '400-MODEM AT Commands List' for information on the AT commands that the 400-MODEM uses.

Remote programming of the FMT-400

If desired the FMT-400 can be remotely programmed when fitted with a 400-MODEM module. The 400-MODEM module must be connected to Port 0 of the CPU module within the system using the cable supplied. Using Flex32 you can dial up the remote FMT-400, when connected you can use Flex32 exaclty as you would when connected to the FMT-400 with a programming lead.

Important: HEALTH and SAFETY

WARNING WARNING

WHEN REMOTE DEBUGGING / PROGRAMMING OF FMT-400 PROGRAMS IS PERFORMED EXTREME CAUTION IS RECOMMENDED. AS NORMAL PROGRAM FUNCTION MAY BE ALTERED MIS-OPERATION OF MACHINERY MAY RESULT WHICH MAY CAUSE HARM TO EQUIPMENT OR PERSONS.
IT IS THEREFORE RECOMMENDED THAT A SUITABLE RESPONSIBLE PERSON IS ADJACENT TO THE EQUIPMENT WHILST REMOTE DEBUGGING / PROGRAMMING IS CARRIED OUT TO ENSURE A SAFE SITUATION IS MAINTAINED. SEE THE MONITOR FUNCTION AVAILABLE THROUGH THE CPU MENU SYSTEM WHICH CAN BE USED TO ENABLE MONITORING BUT NO CONTROL / PROGRAM UPDATING TO TAKE PLACE VIA THE PROGRAMMING PORT.

Colter Group

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Order Codes

Part Number
400-MODEM

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