



General Purpose 8 bit CPU module
80Kb user program storage
Supports Ladder and High level language programming
Two built in RS 232 comms ports

Introduction

The 400-CPU-A is a general purpose central processor module for use within the FMT-400 system. The 400-CPU-A is the most basic CPU module in the FMT-400 range but still benefits from extensive 16 and 32 maths capabilities and RS232 communications supporting many different protocols amongst many other features. It is programmed using the Flex32 software development package.

Modules Supported by the 400-CPU-A

The modules supported by the 400-CPU-A module are listed in the table below:

<u>Module</u>	<u>Description</u>
400-16-I	16 channel 24Vdc input module.
400-16-IAC110	16 channel 110Vac input module.
400-32-I	32 channel 24Vdc input module.
400-16-Q	16 channel 24Vdc output module.
400-16-QR	16 channel relay output module.
400-32-Q	32 channel 24Vdc output module.
400-8-AI	8 channel Analogue input module.
400-4-AQ	4 channel Analogue output module.
400-8-AQ	8 channel Analogue output module.
400-MODEM	MODEM module for connection to PSTN.
400-8-RTD	8 channel RTD interface module.
400-4-RTD	4 channel RTD interface module.
400-8-TC	8 channel thermocouple interface module.
400-4-TC	4 channel thermocouple interface module.

Module Racks Supported by the 400-CPU-A

The racks supported by the 400-CPU-A are listed below:

<u>Rack</u>	<u>Description</u>
RACK-400H	7 slot gear plate mounting module rack. 5 slots available for I/O modules.
RACK-400F	12 slot gear plate mounting module rack. 10 slots available for I/O modules.



Specifications

User Program Memory	80K bytes
User Data Storage (16 bit words)	80K bytes, less user program size
Maximum Number Of Ladder Contacts	8900 (see note 1)
Typical Ladder Scan Time	5.1 mS per thousand contacts (see note 1)
Typical Contact Execution Time	2.95µS (see note 1)
Instructions Per Second	7935
Number of 16 Bit registers	4096
Number of 32 Bit registers	128
Counters	64
Timers	128
Text Strings	256
Maximum Number Of Digital Inputs	128
Maximum Number Of Digital Outputs	128
Maximum Number Of Analogue Inputs	32
Maximum Number Of Analogue Outputs	32
Maximum Number of High Speed Inputs	None supported
Maximum Number of Fieldbus Modules	None supported
Maximum Number of Flash card Modules	None supported
Number Of Extension Racks Supported	None supported
Special Card Support	None supported
Built In Communications Ports	Port 0: RS232 max baudrate: 19200, also doubles as programming port. Port 1: RS232 max baudrate: 19200
Additional Communication Ports	None supported
Memory Back-up	User program stored in flash RAM Data storage and variables stored in battery backed RAM
Battery Life	Typically 5 years with CPU un-powered, 10 years with CPU powered
Clock	Psuedo Real Time Clock, no battery backup
Programming Language	Ladder Logic and High Level Instruction Language, using Flex32 programming package
Operating Temperature	0°C to 55°C
Storage Temperature	-10°C to +70°C
Humidity	10 to 90% non condensing
Current Consumption	118mA from rack 5v power supply
Dimensions	Standard FMT-400 single width module size
Weight	500g

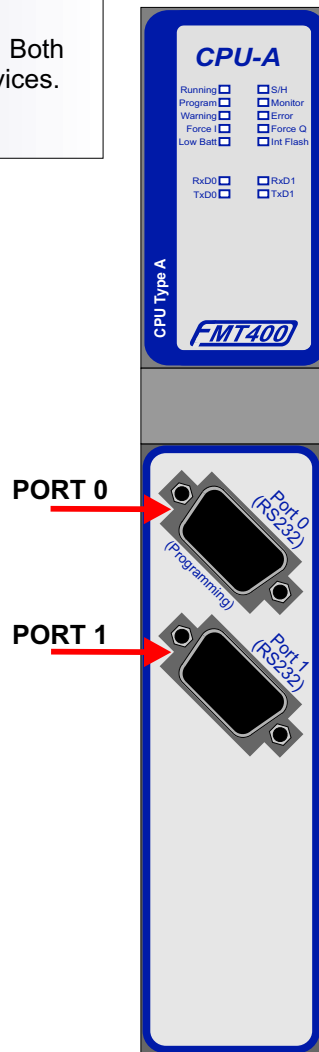
Note 1: These figures are typical for a ladder logic program consisting of simple ladder logic. The scan times and the maximum number of contacts will vary according to program content, comms and whether the High Level Instruction Language is used in the same project.

RS232 Communications Ports

The 400-CPU-A has two built in RS232 communication ports. Both ports have a 9 way D-type connector to connect to RS232 devices. Pin assignments for the 9 way D-types are listed below:

Pin No	Port 0 *	I/O	Port 1
1	Protective Earth	-	Protective Earth
2	Receive Data	I	Receive Data
3	Transmit Data	O	Transmit Data
4	N/C	-	N/C
5	N/C	-	N/C
6	Programming	I	N/C
7	Common	-	Common
8	N/C	-	N/C
9	N/C	-	N/C

* Port 0 is also the programming port



LED Descriptions

Label	Colour	Description
Running	Green	When illuminated indicates that the 400-CPU-A is running the user program stored inside. Flashes quickly after power up for a short period while the 400-CPU-A is checking the integrity of the user program.
S/H	Green	This is normally illuminated but will be extinguished in the event of an internal failure of the 400-CPU-A.
Program Monitor	Green	Indicates that a programming lead as been connected to port 0. Indicates that the 400-CPU-A has been placed in monitor only mode. For more information on this mode please see the Flex32 online help.*
Warning	Red	A warning has been detected by the 400-CPU-A firmware. Use the alarm option within Flex32 to find out which warning has occurred.*
Error	Red	An error has been detected by the 400-CPU-A firmware. Use the alarm option within Flex32 to find out which warning has occurred.*
Force I	Red	One or more inputs have been forced on or off. Use the debugging facilities within Flex32 to set or clear forces.*
Force Q	Red	One or more outputs have been forced on or off. Use the debugging facilities within Flex32 to set or clear forces.*
Low Batt	Red	When illuminated the battery requires replacement. Note that internal flag 7 also reflects this state.
Int Flash	Yellow	Indicates that the 400-CPU-A is writing the downloaded program to the internal Flash memory. DO NOT turn the system off when this LED is illuminated.
RxD0	Green	When flashing data is being received on by port 0.
RxD1		When flashing data is being received on by port 1.
TxD0		When flashing data is being sent out by port 0.
TxD1		When flashing data is being sent out by port 1.

* The display menu system also allows access to these situations. The display menu system is controlled by the keypad and inbuilt display on the power supply (PSU-400) for more information please see the separate PSU-400 data sheet.



Data Logging and Battery Backed RAM

The Ram within the 400-CPU-A can be used for data logging and similar purposes if so desired. The space available within the Ram is 80Kb less the size of the user program. For more information on data logging please see the Flex32 on-line help. There is also battery backed RAM which is available for the preservation of internal facilities (such as registers and flags). For more information on the preserving of facilities please see the Flex32 on-line help.

Changing the Battery

The internal battery on the 400-CPU-A should be replaced if the Batt LED is illuminated. The battery can be replaced as follows:

- * If the 400-CPU-A is still fitted in the rack then remove from rack.
- * The battery can be seen on the PCB side of the module (it is a silver button cell battery).
- * Remove the battery using finger pressure only.
- * Replace the battery with one only of the same type. If in doubt new batteries are available from your supplier.

NOTE: Depending on the state of charge of the old battery you will have up to one minute to swap batteries before volatile information (such as date/time and preserved facilities) is lost.



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Order Codes

Part Number
400-CPU-A

COLTER GROUP
COLTER PRODUCTS LIMITED

UNIT 7, ZONE C
CHELMSFORD ROAD INDUSTRIAL ESTATE
DUNMOW
ESSEX
CM6 1HD

Telephone: + 44 (0)1371 876887
Fax: + 44 (0)1371 875638

E-Mail: sales@coltergroup.co.uk
Web Site: www.coltergroup.co.uk

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