



CHIYU

Product Specification

BF-450(M)/BF-430

RS232/RS485/RS422 To TCP/IP Converter Module

Release 1.0

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1. Revision History

Date	Release	Author	Description
October 13, 2003	1.0	Eric Chang	First Release

2. Related Documents

Date	Author	Document
Sept. 2003	Eric Chang	Spec

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3. Introduction

The BF-450(M)/BF-430 is a RS232/RS485/RS422 to TCP/IP converter integrated with a robust system and network management features designed for industrial equipment to be accessed and controlled via Intranet or Internet.

By integrating RTOS (Real Time Operating System) and complete TCP/IP protocol stack capability, Chiyu's BF-450(M)/BF-430 provides not only a robust and high performance system to make your device connecting to Network, but also ease installation and Internet access.

The BF-450(M)/BF-430 Web Configurator is a breeze to operate and totally independent of the operating system platform you use.

Main features:

■ TCP/UDP server/client support

The BF-450(M)/BF-430 support four types of connection: TCP server, UDP server, TCP client and UDP client, user can select one of types to meet application requirement.

■ DHCP Client

DHCP (Dynamic Host Configuration Protocol) client obtains the TCP/IP configuration at start-up from a centralized DHCP server, which means it can get IP address, an IP default gateway and DNS server.

■ PPP Over Ethernet

PPPoE is a protocol for connecting remote hosts to the Internet over DSL connection by simulating dial-up connection.

■ Dynamic DNS

With dynamic DNS support, you can have a static hostname alias for a dynamic IP address, allowing the host to be more easily accessible from various locations on the Internet.

■ Auto-negotiating 10/100Mbps Ethernet

The Ethernet interface automatically detects if it is on a 10 or a 100 Mbps Ethernet.

■ Full Network Management via Web

This feature allows you to access or manage device through IE or Netscape on any platform. The firmware also can be upgraded via Web browser.

■ Backup and Restore configuration

This feature allows you to backup system configuration to a file and restores it, for the security issue, the file which backup from system is an encryption format.

■ IO Controller

The BF-450(M)/BF-430 supports 3 DI/3 DO totally; 3 DI with any combination rule can trigger each DO. By providing a smart and easily setup way via Web, user doesn't need to have any programmer background.

■ Alarm Generation

With SMTP client support, you can set system to trigger alarm message via e-mail or SMS (Short Message System) to your mobile phone.

4. Product Specifications

This section defines the hardware and software specifications in BF-450M.

4.1 Hardware Features

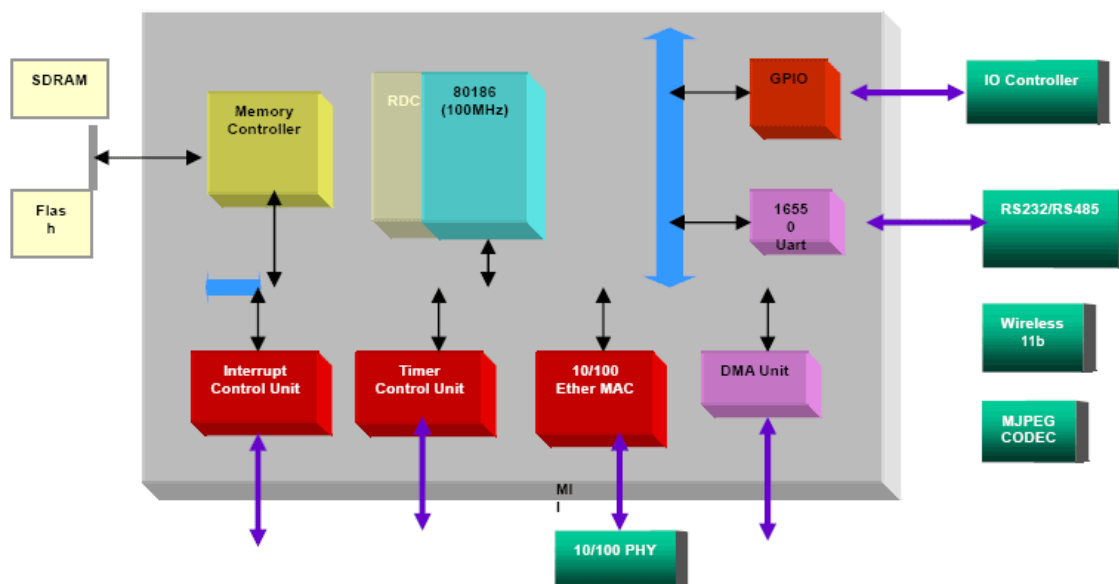
4.1.1 Feature List

Ethernet		One 10/100 Base-T/Tx auto-sensing Auto MDI/MDI-x port
Serial		One RS232/485 hardware selected
RS232 signals		TxD,RxD,RTS,CTS,DTR,DSR,DCD,GND , 1200bps ~ 230.4kbps
RS485 signals		2 wire DATA+/-
RS422 signals Tx+/Tx-/Rx+/Rx-CPU	4 wire	RDC 1610C, 100MHZ
Flash ROM		256k bytes
SDRAM		1M bytes
Watch dog		System never halt
I/O support		3 DI/3 DO
Sys. Power:		DC 9V ~ 30V(BF-450/BF430),DC 5V~7V(BF-450M), 200mA
EMI/EMC:		FCC B, CE B
Operation Requirement		Operating Temp. 0°C to 55°C Storage Temp. -20°C to 85°C Operating Humidity 5% to 95% Non-Condensing
Dimensions		75 x 110 x 20 mm (W x D x H)
Surge protection		Serial port 15KV ESD
Magnetic protected		Ethernet port 1.5KV
Connector type		DB9(Female)/RJ-45

4.1.2 LED status

LED	Color(s)	Activity	Desc.
Power	Green	Off	Power OFF
		Green Blinking	Booting/System Self-Test
		Green On	Device Ready
Ethernet	Link Green	Off	No Ethernet Link
		Green On	Ethernet Link established
	SPD Green	Off	10 Mbps
		Green	100 Mbps
	Collision Red	Off	No collision
		Red	Collision
	ACT Green	Off	No data activity
		Green Blinking	Transmitting/Receiving
Transaction	Link Green	Off	No TCP/IP session link
		Green On	TCP/IP session link established
		Green Blinking	Data Sending/Receiving between Serial and Ethernet

4.1.3 Block Diagram



4.1.4 Serial Port

Baud Rate: 1200bps ~ 230.4Kbps

Data Bits: 5,6,7,8

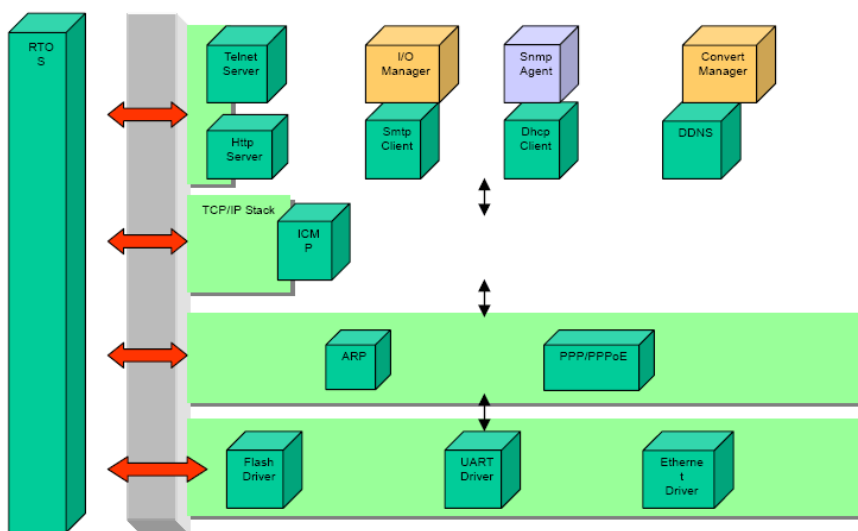
Parity Check: None, Even, Odd, Mark, Space

Stop Bits: 1, 2

Flow Control: None, XON/XOFF, CTS/RTS

4.2 Software Features

4.2.1 Software Architecture



4.2.2 TCP/IP Protocol Stack Support

- RFC0768 - User Datagram Protocol (UDP)
- RFC0791 - Internet Protocol (IP)
- RFC0792 - Internet Control Message Protocol (ICMP)
- RFC0793 - Transmission Control Protocol (TCP)
- RFC0826 - Ethernet Address Resolution Protocol (ARP)
- RFC0919 - IP Broadcast Data grams
- RFC2581 - TCP Congestion Control

4.2.2.1 PPPoE

- RFC2516 – A method for transmitting PPP over Ethernet (PPPoE)
- RFC1144 - TCP/IP Header Compression (Van Jacobson)
- RFC1332 - PPP Internet Control Protocol (IPCP), Support fixed IP also
- RFC1334 - PPP Authentication Protocol (PAP)
- RFC1994 - PPP Challenge Handshake Authentication Protocol (CHAP)
- RFC1661 - PPP General Rules, Link Control Protocol (LCP)
- Supports auto-disconnect time-out for security reasons

4.2.4 DHCP Client

- RFC2131 - Dynamic Host Configuration Protocol (DHCP) client.

4.2.5 Static IP

- Support static IP for the application required to assign a permanent IP address
- Allow user to assign WAN IP Address, Subnet Mask, Default Gateway Address, DNS Server

4.2.6 Dynamic DNS

Support Tzo.com and Dyndns.org dynamic domain name servers. System will update new IP when is different from the IP of previous one automatically.

4.2.7 SMTP Client

Sending E-Mail and SMS (Short Message Service) notice user the emergency status.

4.2.8 HTTP Server for Web-based Management

- RFC1866 - Hypertext Markup Language 2.0
- RFC1945 - Hypertext Transfer Protocol HTTP 1.0
- Username and password protected for web management login.

4.2.9 Telnet Management Interface

- RFC0854 - Telnet Server
- Username and password protected for login.

4.2.10 TFTP Server (Boot code only)

Download AP firmware.

4.2.11 MAC Clone

Allow user to change Ethernet MAC address to connect Cable Modem

4.2.12 Build-In Ping function

Support Ping function in Web and Telnet management for networking environment diagnose.

4.2.13 Block Ping request

Prevent system from DOS attack.

4.2.14 Reset system to factory default

Provide two ways of reset system to factory default; one is by Web and Telnet management, the other is by serial port in 3 seconds when system boot up.

4.2.15 Smart I/O controller

By smart design of I/O configuration, zero line code programming to integrate with your system.

4.2.16 Firmware upgrade

No additional utility has to install on PC, build-in firmware upgrade function in Web management makes operation easily.

5. Manual

CHIYU will provide user guide.

6. Necessary Approvals

CHIYU will obtain approvals for FCC and CE.

7. Warranty

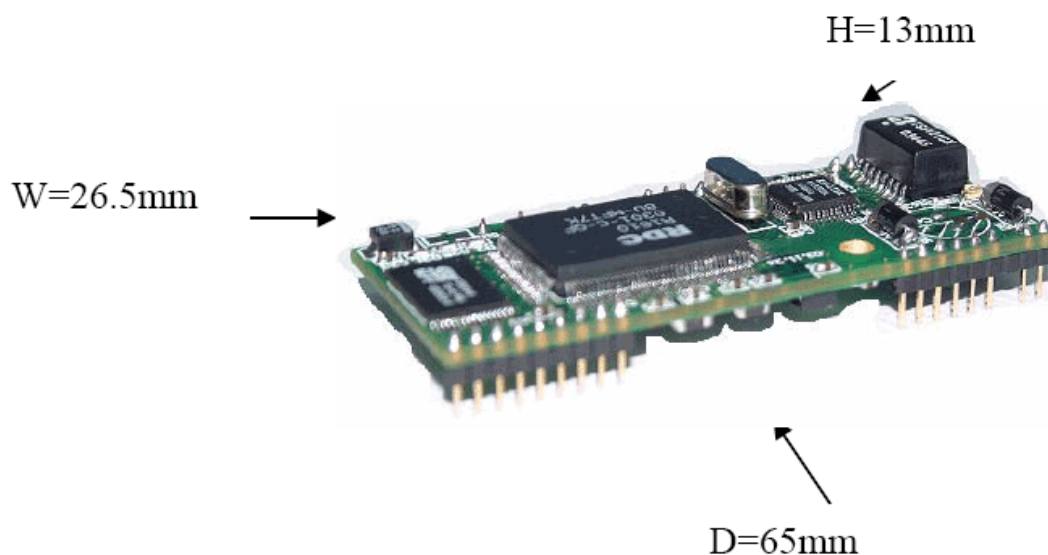
CHIYU will provide 1-year warranty.

8. Comparison Chart

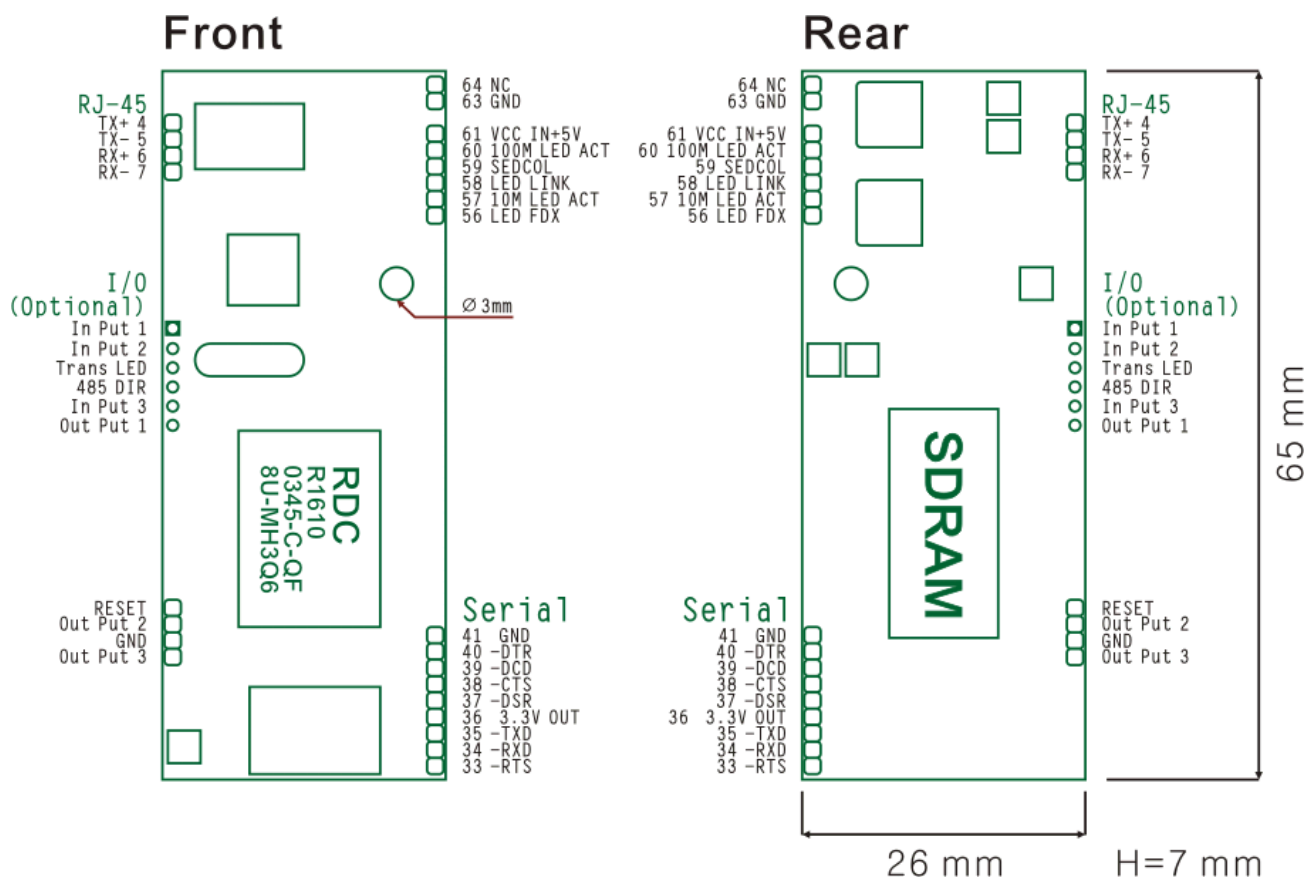
Item	Full Type	Simple Type (Socket Type)
Ethernet port	RJ-45 connector	Without connector (Only pin out)
Serial port	RS-232 (DB9) & RS-422/485connector	TTL only
Power connector	With connection port	PIN only
LED	Yes	PIN output
I/O Control	Yes	No
SMTP Protocol	Yes	No
Short Message Service	Yes	No
Surge protection on serial side	Yes	No
Size	75x120x20mm	27x65x20mm

Basically, the simple type is designed for plugging into an original system & the full type is working as an external device to help equipment to connect to Internet.

BF-450M (Socket Type) I/O Pin Description



9. I/O PIN Description



Pin #	Signal Name	I/O	Description
4 5	TX+ TX-	O	Twisted Pair Transmit Outputs. Differential transmit output for 100BaseTX or 10BaseT to magnetic.
6 7	RX+ RX	I	Twisted Pair Receive Inputs. Differential receive input pins for 100BaseTX or 10BaseT from the magnetic.
24	RESET	I	Module Reset (with weak pull-up). The active low –RESET input resets the Serial Module logic. –RESET is tied to VCC through a 400ms time constant circuit for “Power-on-Reset” functionality. The module is ready to accept commands with 3 seconds of power-on or reset.
26	GND	GND	Ground.
33	-RTS	I	Request to Send (Active Low). RTS signal is used for hardware flow control.
34	-RXD	O	Receive Data (CMOS Level, IO=10ma, Active Low). The module uses the RXD line to send data to the DTE and to send module responses to the DTE. During command mode, -RXD data presents the module responses to the DTE. Module responses take priority over incoming data when the two signals are in competition for –RXD. When no data is transmitted, the signal is held in mark condition.
35	-TXD	I	Transmitted Data (Active Low). The DTE uses the –TXD line to send data to the module for transmission or to transmit commands to the module. The DTE should hold this circuit in the mark state when no data is being transmitted or during between intervals between characters.
36	3.3V Out	O	3.3V Out. This signal is present to maintain compatibility with other Multi-Tech modules.
37	-DSR	O	Data Set Ready (IO=10ma, Active Low). –DSR indicates module status to the DTE. DSR OFF (high) indicates that the DTE is to disregard all signals appearing on the interchange circuits. It reflects the status of the local data set and does not indicate an actual link with any remote data equipment.
38	-CTS	O	Clear to Send (IO=10ma, Active Low). –CTS is controlled by the module to indicate whether or not the module is ready to transmit data. –CTS ON indicates to the DTE that signals presented on TXD will be transmitted. –CTS OFF indicates to the DTE that it should not transfer data across the interface on TXD.
39	-DCD	O	Data Carrier Detect (IO=10ma, Active Low). –DCD output is ON (low) when the module is ready to send/receive data.
40	-DTR	I	Data Terminal Ready (Active Low). The –DTR input is turned ON (low) by the DTE is ready to transmit or receive data.
41	GND	GND	Ground.
56	LED FDX	I/O	LED Output. During normal operation, this pin lights the FDX LED to indicate a full duplex mode. Active Low.
57	LED ACT	I/O	Output. During normal operation, this pin lights the Activity LED when transmitting or receiving. It will flash at a rate of 50ms high and 50ms low when active. Active Low.
58	LED LINK	I/O	LED Output. During normal operation, this pin lights the LINK LED to indicate a good link is detected. Active Low.
59	LED COL	I/O	LED Output. During normal operation, this pin lights the COL LED to indicate a collision. It will flash at a rate of 50ms high and 50ms low when active. Active Low.
60	LED SPD	I/O	LED Output. During normal operation, this pin lights the SPEED LED to indicate 100Mbps is selected. Active Low.
61	VCC	IN	PWR 5V dc
63	GND	GND	Ground.
64	NC		No Connect