

DF1725IED MCU-G User Manual



Dongfang Electronics Co., Ltd

1 Overview

From developing the first set of RTU of China in 1982, Dongfang keeps effort in providing customers with more reliable、 flexible、 stable and powerful products. With more than 10000 installed RTUs at around 2000 sets of substation and feed automation system ,DFE is working to provide more reliable、 flexible、 stable and economic products.

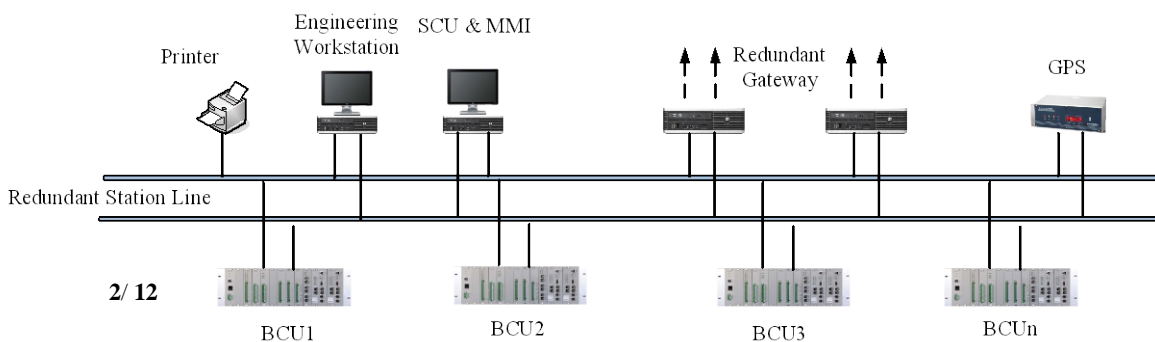
DF1725IED is a typical example derived from above mentioned target. For its flexible, reliable and stable design, DF1725IED can be used as Gateway, Protocol converter, Centralized RTU, Bay Control Unit and FRTU for transmission and distribution substation, RMU, Pole-top Feeder and other Location to improve the utility’s performance

1.1 Applications

DF1725IED MCU-G is used for collecting, processing and transferring communication data in substation as the Gateway. Also it can be used as protocol converter to communicate with other IEDs in substation and transfer to standard communication protocol to control center. The communication network can adopt Ethernet, comport, loop field network etc. Normally the DF1725IED MCU-G shall be applied with DF1725IED BCU, HMI etc to construct the substation automation system.

The typical diagram as below:

Typical Substation Automation System Architecture Diagram



1.2 Main Functions

- Set system configurations and simulating and debugging the system.
- Adopt GPS to implement the time synchronization of station devices.
- Implement redundant or active/standby mode and dual network.
- Realize remote communication through data channel or optical interface ,able to access eight-channel SCADA/EMS at the same time.
- Support multiple communication protocols such as IEC 61850,IEC 60870-101/103/104,and DNP3.0.
- Operating system supplies various log record functions ,such as variation record of operation situation ,record of operation and operation system configuration information.
- Inlaid real-time data ,storing historical data of operation system and log information.
- File management agency ,supplying file creation ,file delete and modification of file attributes.
- The operation system totally supports functional service catering to IEC 61850 standard
- The operation system supplies functional formula programme ,which can successfully complete complicated logical and numerical value calculation
- The operation system supplies various log information as well as friendly search method

2 Technical Features

2.1 Advancement

DF1725IED MCU-G is 32 digit multi task real-time communication control system developed under real-time multitask operating system software platform .DF1725IED MCU-G can conveniently communicate with all kinds of devices that accord with standards such as IEC 61850 standard through simple model configuration including devices that accord with standards such as control device and protection device.DF1725IED MCU-G has powerful computing capability .TO realize calculation function ,as a set of convenient formula system with powerful functions has been designed .Provide many kinds of protocol converters and pressure reactive power automatic control and network protocols stacks for protected foreign communication protocols

2.2 Reliability

DF1725IED MCU-G is a central data control system developed on the basis of Intel industry CPU hardware platform and software platform ,which ensures the reliability of system development platform .On hardware ,DF1725IED MCU-G is not equipped with fan ,adopts power-off detection means and RAM disk technology ,which ensures the reliability of system files .On system monitoring and memory separation technology making sure of system's reliability.

2.3 Maintainability

System provides configuration software which can be used to flexibly configure system parameters ,device parameters and communication parameters.

3 Technical Data

3.1 Hardware Parameter

- CPU: Intel® Atom™ Processor N270, 1.6GHz Single Core with HT
- EMS memory: max 2G,DDR2 RAM
- Storage: Supporttwo 2.5 inch SATA hard disk , two DOM
- Display interface: VGA, DVI, LVDS.
- Chipset:Intel® 945GSE + Intel®ICH7R
- Keyboard&Mouse: standard PS2/keyboard/mouse
- VGA: DB—15 VGA connection
- DVI: DVI-D
- LVDS: DUAL 16 Bits
- Audio: 6 inputs&outputs
- Outer expansion: 2 PC104 plus interfaces, 1 PMC extended interface
- USB: 6 USB interfaces ,compatible with USB2.0
- Ethernet port: 8Intel®8257410M/100/1000M Adaptive Ethernet ports, support IEEE1588
- Serial ports: COM1-COM10

3.2 Communication Interface

- 2 RS-232/485/422 interfaces(able to configure jumper free)
- 8 RS-232/485 interfaces
- 8 10M/100M/1000M twisted-pair Ethernet interface

3.3 Communication Protocol

- IEC60870-5-101
- IEC60870-5-103
- IEC60870-5-104

- IEC 61850
- DNP 3.0 over serial and TCP/IP
- MODBUS
- WISP+
- HNZ
- ABB INDACTIC- 2033
- HDLC Hitachi
- Additional third party/country specific protocols are available

3.4 Communication Speed

- Serial interface RS-232/485/422 300~57.6K bit/s
- Ethernet interface 10M/100M/1000M bit/s

3.5 Power Supply

- AC220V/DC220V \pm 20%
- AC110V/DC110V \pm 20%

3.6 Operating environment

- Environment temperature -25~65 $^{\circ}$ C
- Relative humidity 5%~95%
- Atmospheric pressure 80kPa~110kPa

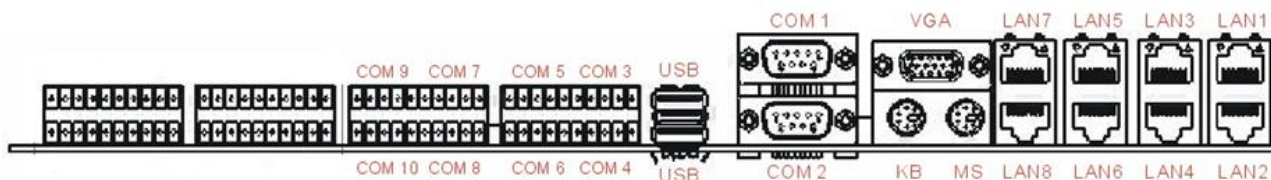
3.7 Response time

- Main wiring diagram signal \leq 2 s
- Position change signal \leq 2 s
- System switchover \leq 10 s

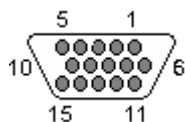
4 Definition of Interface

4.1 Rear Side Interface

- VGA 口
- Keyboard/Mouse 口
- LAN1 – LAN8 接口
- USB1,2
- COM1,2 DB9
- COM3—COM10 Terminal
- Power input

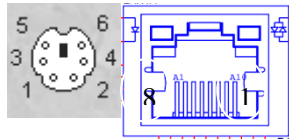


4.2 VGA



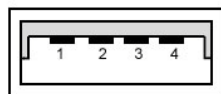
Pin	Definition	Pin	Definition
1	(RED)	9	(KEY)
2	(GREEN)	10	(SGND)
3	(BLUE)	11	(ID0)
4	(ID2)	12	(ID1/SDA)
5	(GND)	13	(HSYNC/CSYNC)
6	(RGND)	14	(VSYNC)
7	(GGND)	15	(ID3/SCL)
8	(BGND)		

4.3 Ethernet Port



Pin	10M	100M	1000M
1	TX+	TX+	DATA0+
2	TX-	TX-	DATA0-
3	RX+	RX+	DATA1-
4	NC	NC	DATA1+
5	NC	NC	DATA2+
6	RX-	RX-	DATA2-
7	NC	NC	DATA3+
8	NC	NC	DATA3-

4.4 USB



- 1—VCC
- 2—DATA-
- 3—DATA+
- 4—GND

4.5 Com port

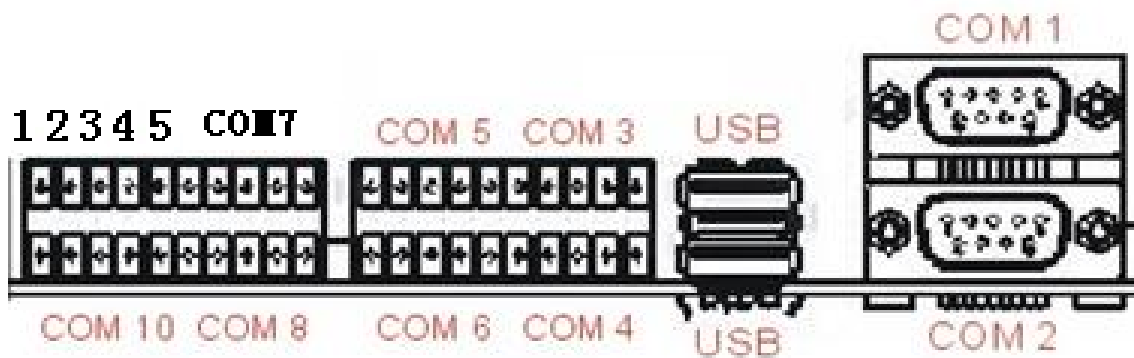
4.5.1 Com1~Com2 DB9

DB9	RS232	RS485	RS422
1	DCD	DATA- (B)	TX-
2	RXD	DATA+ (A)	TX+
3	TXD		RX+
4	DTR		RX-
5	GND	GND	GND
6	DSR		
7	RTS		

8	CTS		
9	RI		

4.5.2 Com3~Com10 Terminal

Terminal	RS232	RS485
1	TXD	
2	RXD	
3		DATA-
4		DATA+
5	GND	GND



4.6 Power supply input

AC Input: L , N , G

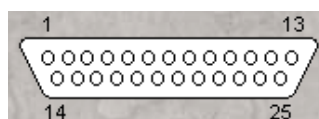
DC Input : L : + , N : - G

S1,S2: power lose alarm



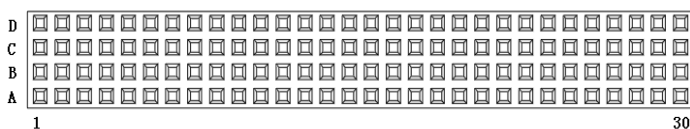
S1 S2 NC L N G

4.7 LPT



Pin	Definition	Pin	Definition
1	(STROBE)	10	(ACKNLG)
2	(DATA0)	11	(BUSY)
3	(DATA1)	12	(PE)
4	(DATA2)	13	(SLCT)
5	(DATA3)	14	(AUTOFEED)
6	(DATA4)	15	(ERROR)
7	(DATA5)	16	(INIT)
8	(DATA6)	17	(SLCTIN)
9	(DATA7)	18-25	(GND)

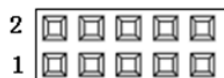
4.8 PC104/PCI



	A	B	C	D
1	GND	KEY ₂	Reserved	+5V
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0*	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1*	AD15	+3.3V
9	SERR*	GND	SB0*	PAR
10	GND	PERR*	+3.3V	SDONE
11	STOP*	+3.3V	LOCK*	GND
12	+3.3V	TRDY*	GND	DEVSEL*
13	FRAME*	GND	IRDY*	+3.3V
14	GND	AD16	+3.3V	C/BE2*
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3*	VI/O	IDSEL3

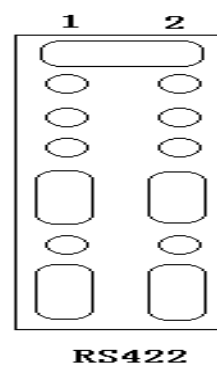
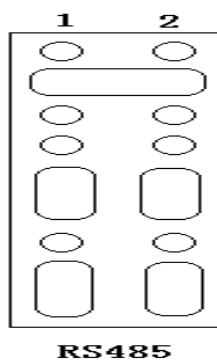
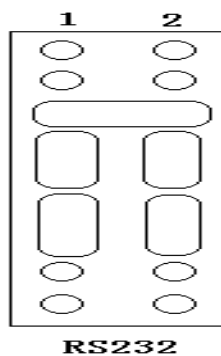
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0*	GND	REQ1*	VI/O
24	GND	REQ2*	+5V	GNT0*
25	GNT1*	VI/O	GNT2*	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD*	+5V	RST*
29	+12V	INTA*	INTB*	INTC*
30	-12V	Reserved	Reserved	GND

4.9 SPI

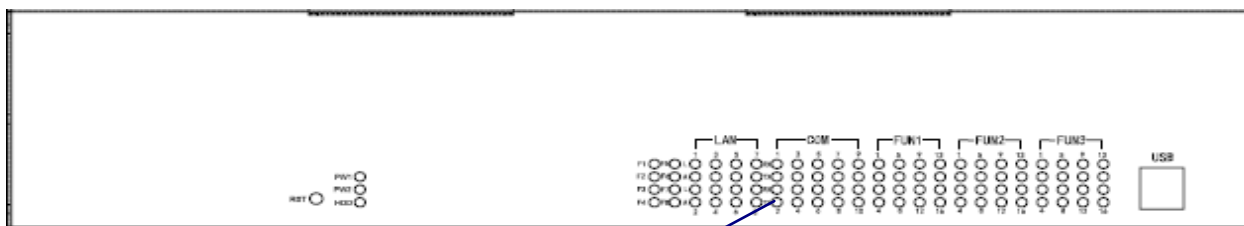


Pin	Definition	Pin	Definition
1	(+3VSB)	2	(+3VSB)
3	(MISO)	4	(MOSI_F)
5	(CS#)	6	(CLK_F)
7	(GND)	8	(GND)
9	(HOLD#)	10	(NC)

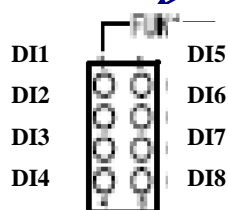
4.10 COM1,COM2 Jumper setting



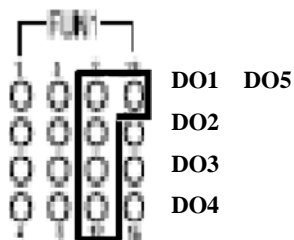
5 Front Side LED



DI LED



DO LED



IRIG-B LED

