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P1/6

WU-1

(Battery system wrench wireless unit)

Communication specifications

(The 1st edition).

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1. Specification of serial output (RS-232C)

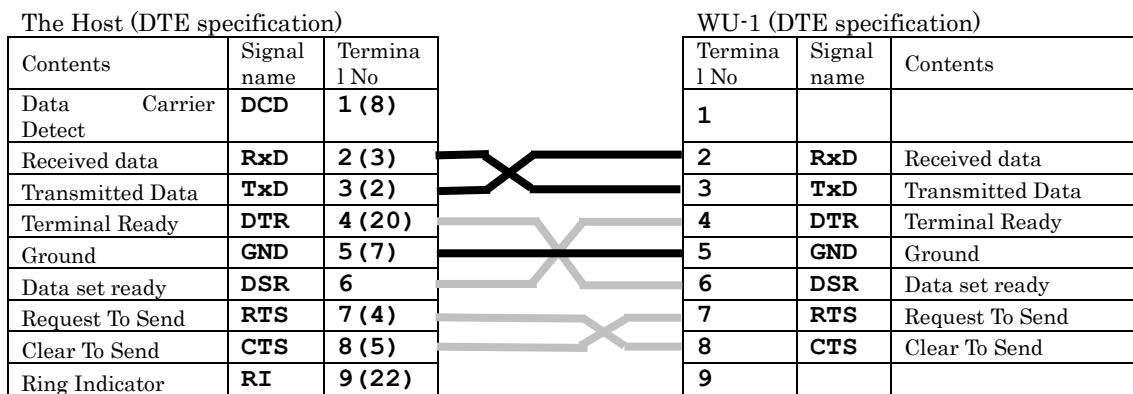Here is the serial communication (RS232C) specifications.

	Back connector
Transmission scheme	Asynchronous communication method
Connection	DTE
Transmission speed	To be selected by setting (2400bps,4800bps,9600bps, 19200bps, 38400bps, 115200bps)
Character configuration	Start bit: 1bit. Data length: 8bit. Stop bit: 1bit. To be selected by setting Parity :(None,odd parity,even parity)
Character Code	ASCII(Alphanumeric character and control code)
Connector on the controller side	D-Sub 9P male

Table 1.1. Specification of serial communication (RS232C)

(Note) Those setting items underlined with bold face are the default values.

Use the cross (reverse) cable in order to connect with the host (DTE specification) because the connector has DTE specification.

Connection to the host

The Host (DTE specification) WU-1 (DTE specification)

Contents	Signal name	Terminal No		Terminal No	Signal name	Contents
Data Carrier Detect	DCD	1(8)		1		
Received data	RxD	2(3)		2	RxD	Received data
Transmitted Data	TxD	3(2)		3	TxD	Transmitted Data
Terminal Ready	DTR	4(20)		4	DTR	Terminal Ready
Ground	GND	5(7)		5	GND	Ground
Data set ready	DSR	6		6	DSR	Data set ready
Request To Send	RTS	7(4)		7	RTS	Request To Send
Clear To Send	CTS	8(5)		8	CTS	Clear To Send
Ring Indicator	RI	9(22)		9		

The terminal number of the host indicates D-Sub 9 pin. The number of inside ( ) indicates D-sub 25 pin.

2. LAN (Ethernet)

2.1. Ethernet specification.

		Initial value
Connector shape	RJ-45	
Interface	100BASE-TX/10BASE-T (Automatic recognition)	
Protocol	TCP/IP　(Server function)	
IP address	Arbitrarily setting, input range: 0～255.0～255.0～255.0～255	192.168.124.20
Subnet Mask	Arbitrarily setting, input range: 0～255.0～255.0～255.0～255	255.255.255.0
Port number	Arbitrarily setting, input range: 0～65535	10001
ID number (controller identification number)	Arbitrarily setting, input range: 0～9999	0

Taben2.1. Ethernet specification

2.2. LAN communication starting procedure

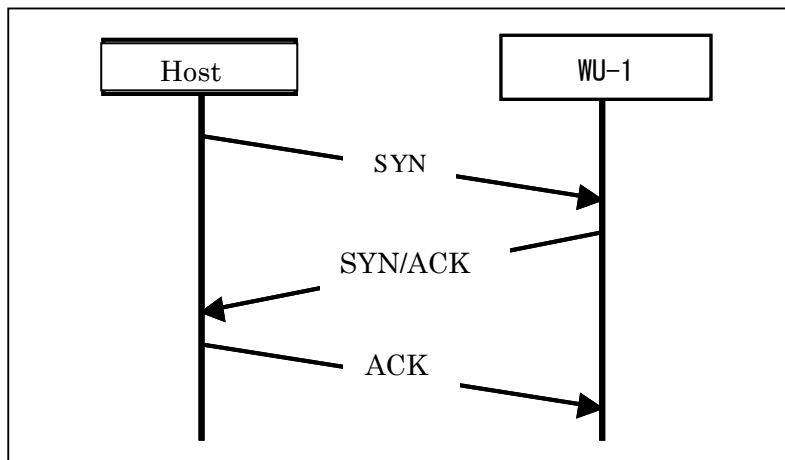It is necessary to open the line from the host to WU-1 to start the communication.

Fig. 2.2 Time flow chart to start LAN communication.

3. Contents of communication

3.1. Basic format.

Send CR and LF as a separator followed after the cable. Transmission is only once and it will not be resent.

電文	CR	LF
	0DH	0AH

3.2. When Bolt Number Management Function ON.

ID number	Tool Number	Work name	Work serial number	-	Remain number	Total judgment	Output Torque value	Torque judgment	Free running Angle
《4》	(1)	【1】	【4】	(1)	(2)	【1】	【5】	【1】	【5】

Tightening angle	Free running Time	Tightening, Time.	Number of pulses	Angle judgment	Blank	Time
【4】	【5】	【5】	(4)	【3】	(1)	(15)

3.3. At bolt number management OFF

ID number	Tool Number	Work name	Total tightening quantity	Torque judgment	Output torque value	Torque Judgment	Free running Angle
《4》	(1)	【1】	【4】	【1】	【5】	【1】	【5】

Tightening angle	Free running Time	Tightening, Time.	Number of tightening pulses	Angle judgment	Blank	Time
【4】	【5】	【5】	(4)	【3】	(1)	(15)

The value in 【 】, ( ), and 《 》 of the column of each item at the bottom is the number of characters (number of byte). 【 】 is output without fail and ( ) and 《 》 are output when output designation is on.

When the output designation of ( ) is off, in case of variable length data, the number of characters inside ( ) is output without a gap and output with space (blank) in case of fixed length data.

Regardless of valiable or fixed length data, when the output designation is off, the items are output without a gap.

Tool ID is output by LAN communication only. It is output when the ID output designation is ON.

3.4. Example of output format

		Byte number	Group management ON		Group management OFF	
			Variable-length	Fixed length	Variable-length	Fixed length
1	ID number	4	×S	×S	×S	×S
2	Tool number	1	×S	△S	×S	△S
3	Work name	1	○	○	○	○
4	Work serial number	4	○	○		
5	'—'	1	×S	△S		
6	Remain number	2	×S	△S		
7	Total Tightened bolt	4			○	○
8	Total judgment	1	○	○	○	○
9	Output torque value	5	○	○	○	○
10	Torque judgment	1	○	○	○	○
11	Free running angle	5	○	○	○	○
12	Tightening angle	4	○	○	○	○
13	Free running time	5	○	○	○	○
14	Tightening, Time.	5	○	○	○	○
15	Number of tightening pulses	4	×S	△S	×S	△S
16	Angle judgment	3	○	○	○	○
17	Blank	1	×△	×△	×△	×△
18	Time	15	×S	×S	×S	×S
	Total Byte number		34 | 62	42 | 62	34 | 59	39 | 59

×S: Output without a gap when no output according to the setting.

△S: Space when no ouput according to the setting.

×△: Output without a gap when no output of time.

Table 3.1 Details of text contents

Item	Reference
Tool ID	Indicates preset tool ID
Tool number	Output the tool number used to tighten. 1 digit of 1~4
Work Name	Output tightened work name. 1 character from a to d (small letter)
Batch serial number	Serial number of the tightened batch. 4 digit of △△△1~9999
Remain number	When the number management is ON, output remain number of the corresponding work number. 2 digit of △0~99
Total tightening number	When the number management is OFF, ouput the total tightening number. 2 digit of △0~99
Total judgemnt	Output the judgment concerning the tightening.(A:pass、N:failed) （Total judgment is a combination with the judgment like the torque judgment and the angle etc.）
Output torque value	Output the working torque value to the output axis.
Torque judgment	Output the judgment result concerning the output torque value. (K:OK、V:OVER、U:UNDER、S:SLOW、、s:SLOW2)
Angle of free running	Output the angle where the output axis will rotate during free running. 4 digit of △△△△0~9999
Tighening angle	Output the angle where the output axix of the tool will rotate by the time it reaches the tightening torque from the display start torque. 3 digit of △△△0～999
Free running time	Output time used for free running. 4 digit of △△△0~9999　（unit : sec)
Tighetneing time	Output time from the display start torque to tightening completion. 4 digits of △△△0~9999　（unit : sec)
Number of tightening pulses	Output number of tightening pulses from the display start torque to tightening completion. 4 digits of △△△1~△△51
Angle judgment	Aok: OK, n31: Free runnig angle is less than the lower limit. n32: Free running angle is over the upper limit. n35: The tightening angle is less than lower limit. n37:The tightening angle is over the uppler limit.
Time	Output the time of tightening opereation　Month/Day　time: min: sec 15 digit of △01/01△00:00:00~△12/31△23:59:59"

Within Total judgemnt:

Torque result \ Result of angle etc..		OK Aok	NG n31~n37
Torque OK	K	A	N
Over	V	N	
SLOW2	s	A	N
UNDER	U	N	
SLOW	S	N	