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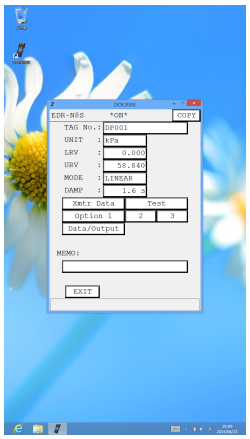
CODE AND SPECIFICATIONS SHEET

Intelligent Communicator
DCR3000



The Model DCR3000 Intelligent Communicator is designed for data communication over a 4 to 20mA DC output transmission line connected with Hitachi Intelligent Sensor series instruments (Differential pressure/Pressure Transmitter, Immersion Type Level Transmitter).
It is connected the USB connector of Windows Tablet/PC and operate it from dedicated software. It allows the user to view, change and compare setting parameters for the Intelligent Sensor series instruments. Also, with this communicator, the user can monitor input/output values and results of self diagnosis and carry out loop check.
The collected maintenance control data of instrument can be saved as a text format file or bitmap image format file to any location.

SPECIFICATIONS

Applicable instruments	Intelligent Differential pressure/Pressure Transmitter series Intelligent Immersion Type Level Transmitter series
Communication Specifications	Hitachi's unique communication method (Described in Table 1)
Function	Described in Table 2
Ambient temperature limits	−10～60℃
Ambient humidity limits	0～95% RH
Connector Type (PC side)	USB Type A Male
Power	USB bus power, Current consumption approx 20mA.
Weight	Approx. 30g
Accessories	Set up disk Sensor connecting cable (2m, alligator clip) Body fixing fastener (2pc)
System Requirements	
OS	Windows 7 / 8 / 8.1, 32 / 64bit, Japanese / English
Processor	400MHz(Minimum), 1GHz(Recommended)
RAM	96MB(Minimum), 256MB(Recommended)
Hard Disk	Up to 1GB of available space
CD-ROM Drive	Use for software setup
Internet Explorer	8 or later
Windows Installer	3.1 or later
.NET Framework	3.5 ※Internet connection or Windows Disk is necessary to enable it, if it is disabled and Windows 8 / 8.1.
Display	Up to 1024 × 768
USB port	USB 2.0 which corresponds to the Host Function
Sound	Internal speaker (Recommended for communication sound)
User Account	Administrator

Please prepare the PC which met system requirements on the customer side.
The conditions such as the listed temperature are available ranges of this product. Please confirm the condition of the PC to use.

Table 1 Communication specifications

Communication Signal	Transmission: In 250Ω communication mode ····· ±0.5mA In 50Ω communication mode ····· ±2.5mA Either one is selectable Reception: ±0.5mA
Communication rate	600bps
Loop load resistance	In 250Ω communication mode ····· 250 to 600Ω, with 24V power supply In 50Ω communication mode ····· 50 to 250Ω, with 24V power supply A line resistance value is included in either case. Relationship between Supply Voltage and Load Resistance, refer to Figure 1.
Communication distance	1.2km or less (Load capacitance 0.22μF or less, Load inductance 3.3mH or less)
Supplied cable	2m (with alligator clips)

Table 2 Functions (1/3)

Item	Function		Processing for Differential pressure/ Pressure Transmitter	Processing for Immersion Type Level Transmitter
Constant value setting	Measurement unit setting		Sets up a measurement unit	Fixed at meters(m)
	TAG No. setting		Sets up a TAG No.	
	Measurement range setting		Sets up a measurement range	
	Output mode setting		Select either Linear/Square root extraction	—
	Sensor mounting position setting		—	Sets up a mounting position
	Density setting		—	Sets up density
	Damping time constant setting		Sets up a damping time constant	
	Set value comparison		Reads out setting data from a connected sensor and compares it with setting data of the communicator	
	Download		Writes setting data of the communicator to the sensor globally	
	Set data storing		Stores setting data or compares it with held data	
	Static Pressure	TAG No. setting	Sets up a TAG No.	—
		Measurement unit setting	Sets up a measurement unit	—
		Measurement range setting	Sets up a measurement range	—
	Flow Temperature	TAG No. setting	Sets up a TAG No.	—
		RTD setting	Sets up a resistance temperature detector	—
		Measurement range setting	Sets up a measurement range	—
	Temperature/ Pressure compensation	Base temperature (Tb)	Sets up a base temperature	—
		Base pressure (Pb)	Sets up a base pressure	—
		Compensation calculation	Sets up a compensation calculation	—
	Reranging		Sets up a measurement range, using the current differential pressure/pressure monitor value as LRV	—

Table 2 Functions (2/3)

Item	Function	Processing for Differential pressure/ Pressure Transmitter	Processing for Immersion Type Level Transmitter
Monitoring	Output monitor	Input : differential pressure, pressure, temperature, static pressure, flow temperature Output : 4 to 20mA	Input : Water level Output : 4 to 20mA
	Monitor data storage	Stores input/output monitor value data	
	Self-diagnosis	Reads self-diagnostic data	
	LCD check	Reads indicate value of LCD	—
Loop check	Fixed value output	Sets output signal at fixed any value temporarily	
	Step output	Sets output signal to constant-cycle step form temporarily	
Adjustment	Zero-point adjustment	Adjusts output signal to 0% level on the assumption that the current input is LRV	
	Span adjustment	Adjusts output signal to 100% level on the assumption that the current input is URV	
	Zero reset	Resets input value to zero when the applied pressure is zero	—
	Zero shift	Performs zero point shift	
	Static pressure reset	Resets static pressure monitor signal to zero when the static pressure is zero	—
	Adjustment history data storage	Stores adjustment history data	
	Zero elevation	Adjusts output signal to any value	—
Individual identification	Specification read-out	Reads out Range Code, Serial No., Revision No. and Total time	Reads out Standard Range, Serial No. and Revision No.
	History data read-out	Reads out error/maintenance history data and zero shift value	
Function setting	Display item setting	Sets up display item	—
	Scaling setting	Sets up indication scale and display unit	—
	Zero cut setting	Sets up an output cut point on output of square root extraction data	—
	Output setting below cut point	Sets up an output less than output cut point on output of square root extraction data	—
	Burn out setting	Sets up a burnout direction to be taken on detection of abnormality in self-diagnosis.	—
	External Setup setting	Sets up a external setup mode	—
	H/L changeover setting	Sets up a pressure input direction (H, L)	—
	Alarm value setting	Sets up an upper/lower limit alarm level for input	
	Static pressure select setting	Select output static pressure value	—
	Mode setting	—	Sets up an output mode
Output	Screen hard copy	Output a bitmap image format file of the currently displayed screen	
	Setting data global output	Displays or output a text format file setting data globally.	
Other	Stored data function	Reads out setting data, adjustment history data and monitor data from stored data. Displays, outputs or deletes these data.	
	LCD check function	Sets up LCD check function	

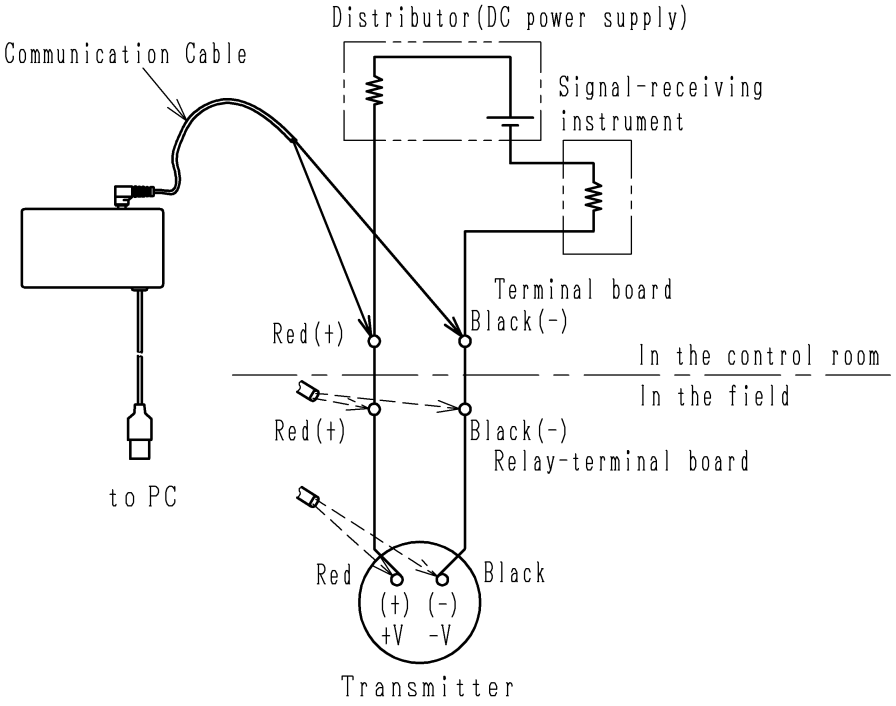
Table 2 Functions (3/3)

Item	Function		Processing for Differential pressure/ Pressure Transmitter	Processing for Immersion Type Level Transmitter
Special functions	4mA/20mA calibration		Calibrates 0% output current to 4mA or 100% output current to 20mA	
	Adjustment reset		Initializes all adjustment values in zero-point adjustment, span adjustment, zero resetting, zero shift and static pressure resetting	
	Output range setting		Sets up an output range for burn-out, saturation and cutoff	Sets up an output range for saturation and cut-off
	Water level reference setting		—	Sets up a reference water level
	Static pressure	Zero-point adjustment	Adjusts output signal to 0% level on the assumption that the current input is LRV	—
		Span adjustment	Adjusts output signal to 100% level on the assumption that the current input is URV	—
	Flow temperature	Zero-point adjustment	Adjusts output signal to 0% level on the assumption that the current input is LRV	—
		Span adjustment	Adjusts output signal to 100% level on the assumption that the current input is URV	—
Optional functions	Capillary compensation function setting		Sets up the capillary compensation function	—
	Density compensation function setting		Sets up the density compensation function	—

The setting items, etc vary according to a connected product and specification.

Please refer to Instruction Manual of this product and intelligent sensor to be connected.

EXTERNAL CONNECTIONS



Note

1. The total resistance (loop load resistance) of input load resistance of the distributor and receiving instrument on the same loop and line resistance should be within the allowable range indicated in Figure 1.
2. To reduce a deflection of output indication due to communication signals, it is required to equip the receiving instrument with a low-pass filter having a time constant of approx. 0.1 sec.
3. If the loop load resistance is less than 250Ω, the 50Ω communication mode is selectable. However, since the signal level from the communicator becomes higher, output indication may deflect on the receiving instrument.
   So, use the 50Ω communication mode after making sure that no trouble will occur in the system.

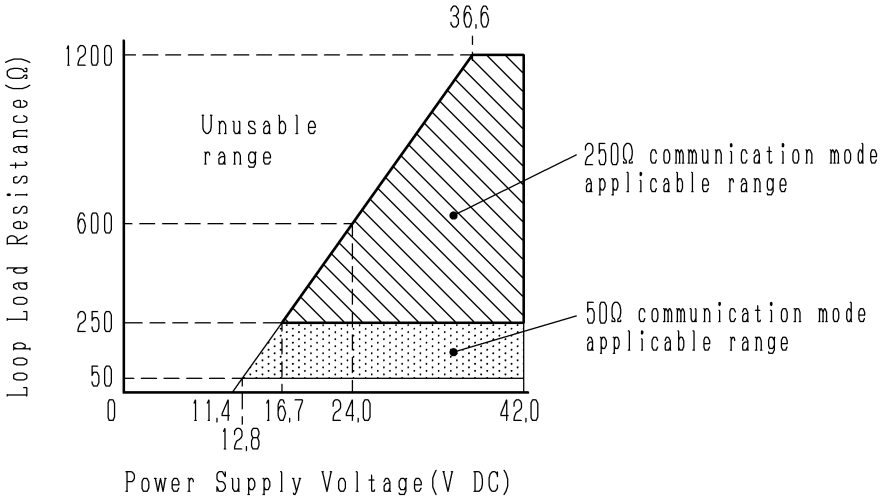


Figure 1 Relationship between Supply Voltage and Load Resistance

REMARKS ON CONNECTIOINS

Depending on the output transmission loop configuration of a sensor instrument, the following caution should be observed.

(1) Where the loop load resistance is less than an allowable level for communication

・If the loop load resistance is less than 50Ω in the 50Ω communication mode.

・If the loop load resistance is less than 250Ω in the 250Ω communication mode.

(Even if the loop load resistance is in a range of 50Ω to 250Ω, output indication may deflect due to communication signals in the 50Ω communication mode to cause an adverse effect on system operation.In this case also, follow the instructions given below.)

In these cases, insert a resistor to the transmission loop as shown in Figure 2 so that the loop load resistance will be within an allowable range of communication.

・Add a resistor between points A and A' or between points B and B'.

・In this arrangement, communication is permitted by connecting the communicator on the left side of A–B (on the side of transmitter or immersion type level transmitter).

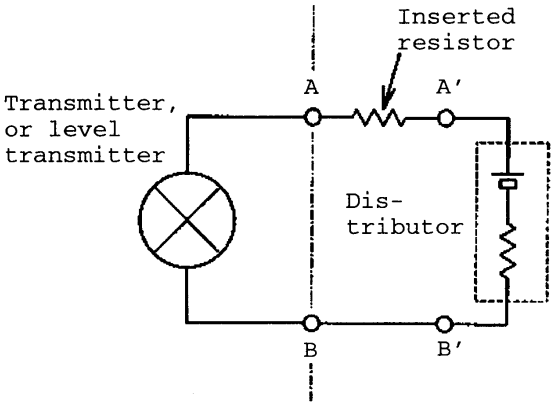
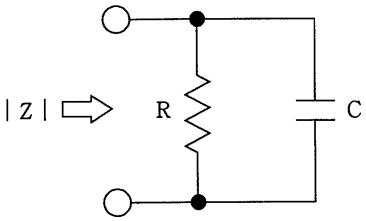


Figure 2 Addition of Resistor to Output Transmission Line (between A and A')

(2) Where a capacitor having a relatively large value is connected in parallel to the input load resistance in the receiving instrument on the transmission loop. (e.g., Flying-capacitor input scheme)

・Figure 3 shows the equivalent input circuit. Even if the input load resistance R is within an allowable range of communication, the capacitor C may absorb the signal frequency component used in communication to disable it.



$$|Z| = \frac{R}{\sqrt{1+(2\pi fCR)^2}} \text{〔Ω〕}$$

|Z| : AC impedance〔Ω〕

R : Input load resistance〔Ω〕

C : Capacitance [F]

f : Communication frequency of 600 [Hz]

Figure 3 Equivalent Input Circuit of Receiving Instrument

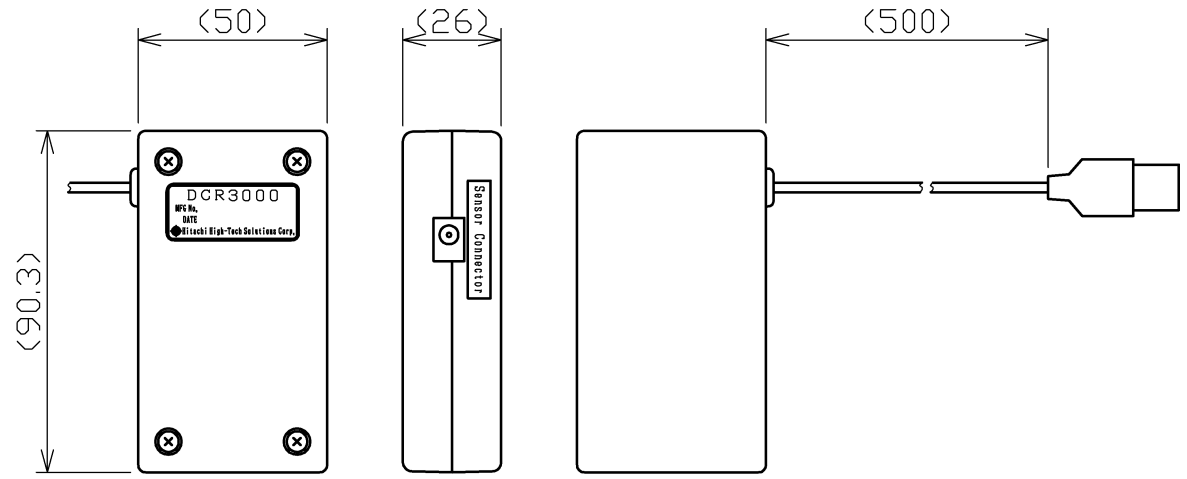
(3) Where the output transmission loop has an inductance load having a relatively large value: (e.g., Electropneumatic converter)

・Communication is disabled if signal frequency components are reflected by the inductance load (more than 80mH). In this case, online communication is impossible. If it is necessary, disconnect an instrument of the inductance load temporarily to provide a loop arrangement having resistance load only. Then, connect the communicator to the loop.

(4) Where external induction noise is given to the output transmission line

・If induction noise due to commercial power frequency (particularly due to frequency components near the communication frequency of 600 Hz) is applied, it may become impossible to distinguish between the communication signals and noise, resulting in communication being disabled. Also, if high-frequency noise is applied, the communicator or sensor instrument may malfunction to disable communication. To prevent the above condition, provide the output transmission line apart from such a noise source as heavy-duty electric devices or large-power lines. For protection against induction noise, use shielded cables or metallic conduits.

DIMENSIONS



[Unit : mm]

CODE TABLE

Code		Description	Accessories
Model	Language		
DCR3000	JP	Japanese	DCR3000 Setup disk Sensor connecting cable (2m, alligator clip) Body fixing fastener (2pc)
	EN	English	

●Be sure to read the Instruction Manual to ensure correct, safe use.
●Some specifications and design are subject to change with or without notice for improvement of quality and performance.