



Modbus TCP/IP

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DGT300+ COMMUNICATION PROTOCOL

1 DESCRIPTION OF THE INTERFACE

DGT300+ is equipped with an Ethernet RJ45 connector on the side of the unit.



Use this port for communication with PLC through Modbus TCP/IP protocol.

2 PROTOCOL DESCRIPTION

2.1 *Modbus TCP/IP protocol specification*

Refer to MODBUS Messaging on TCP/IP Implementation Guide V1.0b.pdf

2.2 *Client / server model*

PLC acts as a client (Master)
DGT300+ acts as a server (Slave)

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2.3 Connection parameters

IP address by default on DGT300+: 192.168.1.33

Local port: Modbus communication usually runs via **port 502**.

2.4 Modbus TCP adress reference

2.4.1 DATA

Data type: Holding register

2 registers are required for 1 float or a long word.

Size and alignment of data types

Type	Size in bits	octet
reg	16	2
int	32	4
long	32	4
float	32	4

2.4.2 TYPES OF DATA

There are 3 types of data:

- DGT300+ **internal setting parameters** (can be read and write from PLC)
- **Acquisition data** parameters (only read)
- **Command parameters** (only write)

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2.5 Parameter definition (read & write holding registers)

@ register	Type	Parameters	Min	Max	factory setting	Hexa value	Nota
0	Float	Memory selection	0	5	0	00 00 00 00	1
2	Float	Language selection	0	7	1	3F 80 00 00	2
4	Float	unit Measure	0	6	6	40 C0 00 00	3
6	Float	unit Diameter	0	1	0	00 00 00 00	4
8	Float	Display Line1	0	6	2	40 00 00 00	5
10	Float	Display Line2	0	6	4	40 80 00 00	5
12	Float	Display filtering	0	99	6	40 C0 00 00	
...		Not applicable					
22	Float	Measure filtering	0	9999	0	00 00 00 00	
24	Float	full scale % value	0	100	100	42 C8 00 00	
26	Float	Measure high value	1	9999	100	42 C8 00 00	
28	Float	Measure low value	0	9999	0	00 00 00 00	
34	Float	Max effort	1	9999	1	3F 80 00 00	
...		Not applicable					
42	Float	Diameter filtering	0	9999	1000	44 7A 00 00	
...		Not applicable					
54	Float	Max diameter value	0.01	99	2	40 00 00 00	
56	Float	Min diameter value	0.01	99	1	3F 80 00 00	
...		Not applicable					
70	Float	Line speed filtering	0	9999	0	00 00 00 00	
72	Float	Speed type selection	0	1	0	00 00 00 00	6
74	Float	Pulse by meter value	1	999	10	41 20 00 00	
76	Float	Speed threshold value	0	100	0	00 00 00 00	
...		Not applicable					
82	Float	Open loop coefficient	0	100	0	00 00 00 00	
84	Float	Close loop coefficient	0	100	100	42 C8 00 00	
86	Float	Inertia coefficient	0	100	0	00 00 00 00	
88	Float	Web width coefficient	0	100	0	00 00 00 00	
...		Not applicable					
96	Float	Alarm 1 value	0	100	100	42 C8 00 00	
98	Float	Alarm 2 value	0	100	0	00 00 00 00	
...		Not applicable					
106	Float	Regulation type selection	0	2	1	3F 80 00 00	7
108	Float	P coefficient	0	9999	30	41 F0 00 00	
110	Float	I coefficient	0	9999	10	41 20 00 00	
112	Float	D coefficient	0	9999	30	41 F0 00 00	
114	Float	P coef(variable pid-small)	0	9999	0	00 00 00 00	
116	Float	I coef(variable pid-small)	0	9999	0	00 00 00 00	
118	Float	D coef(variable pid-small)	0	9999	0	00 00 00 00	

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120	Float	P coef(variable pid-large)	0	9999	0	00 00 00 00	
122	Float	I coef(variable pid-large)	0	9999	0	00 00 00 00	
124	Float	D coef(variable pid-large)	0	9999	0	00 00 00 00	
126	Float	Speed gain value	0	100	0	00 00 00 00	
128	Float	Speed coefficient value	0	100	0	00 00 00 00	
130	Float	Over speed value	0	10	0	00 00 00 00	
...		Not applicable					
140	Float	Set point type selection	0	1	0	00 00 00 00	8
142	Float	Set point value	0	9999	50	42 48 00 00	
144	Float	Slope duration	1	9999	1	3F 80 00 00	
146	Float	Set point filtering	0	9999	0	00 00 00 00	
...		Not applicable					
156	Float	Start delay value	1	999	1	3F 80 00 00	
158	Float	Stop delay value	1	9999	300	43 96 00 00	
...		Not applicable					
166	Float	AO1 upper limit	-10	10	0	00 00 00 00	
168	Float	AO1 bottom limit	-10	10	10	41 20 00 00	
170	Float	Power output gain	1	100	30	41 F0 00 00	
...		Not applicable					
180	Float	E-stop type selection	0	1	0	00 00 00 00	9
182	Float	E-stop fixed value	0	100	0	00 00 00 00	
184	Float	E-stop proportional gain	100	500	100	42 C8 00 00	
...		Not applicable					
190	Float	No stop enable disable	0	1	0	00 00 00 00	10
192	Float	Taper %	0	100	0	00 00 00 00	
						42 48 D7	
194	Float	Hold value	0	100	50	0A	
196	Float	Taper start diameter	0.01	99	1	3F 80 00 00	
198	Float	Output polarity selection	0	1	0	00 00 00 00	11
200	Float	AO2 readout selection	0	3	0	00 00 00 00	12
...		Not applicable					
210	Float	IPAddress_0	0	255	34	42 08 00 00	
212	Float	IPAddress_1	0	255	200	43 48 00 00	
214	Float	IPAddress_2	0	255	200	43 48 00 00	
216	Float	IPAddress_3	0	255	200	43 48 00 00	
218	Float	IPMask_0	0	255	0	00 00 00 00	
220	Float	IPMask_1	0	255	255	43 7F 00 00	
222	Float	IPMask_2	0	255	255	43 7F 00 00	
224	Float	IPMask_3	0	255	255	43 7F 00 00	
226	Float	IPGateway_0	0	255	6	40 C0 00 00	
228	Float	IPGateway_1	0	255	200	43 48 00 00	
230	Float	IPGateway_2	0	255	200	43 48 00 00	
232	Float	IPGateway_3	0	255	200	43 48 00 00	
...		Not applicable					

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Nota	1	0- M1 / 1- M2 / 2- M3 / 3- M4 / 4- M5 / 5- Ram
	2	0- Fr / 1- En / 2- De / 3- It / 4- Cn / 5- Jp / 6- Tk / 7- Es
	3	0- N / 1- kg / 2- lb / 3- Nm / 4- Pli / 5- Ftlb / 6- %
	4	0- m / 1- in
	5	0- AO1 readout / 1- AO2 readout / 2- setpoint / 3- diameter / 4- measure / 5- AO1 config / 6- AO2 config
	6	0- Analog / 1- Pulses
	7	0- OpenLoop / 1- simplePID / 2- variablePID
	8	0- Internal / 1- external 0/10v
	9	0- Fixe / 1- proportional
	10	0- disable / 1- enable
	11	0-(- → +) / 1-(+ → -)
	12	0- setpoint / 1- measure / 2- diameter / 3- speed

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2.6 Data acquisition definition (read holding registers)

@ register	Type	Acquisition parameters	data information	Nota
260	Long	Logical inputs (A-B-Init- Reg)	binary data	1
262	Long	-		
264	Long	-		
266	Long	-		
268	Long	-		
270	Long	-		
272	Float	Frequency direct		
274	Float	Diameter val (*10)	diameter information (*10)	
276	Long	Logical output: Alarm	binary data	2
278	Long	-		
280	Long	-		
282	Float	VAL P	0-10v signal	
284	Float	VAL I	0-10v signal	
286	Float	VAL D	0-10v signal	
288	Float	info1 =Open loop	0-10v signal	
290	Float	info2 = Close loop	0-10v signal	
292	Float	info3= Inertia	0-10v signal	
294	Float	info4 = rotation speed	0-10v signal	
296	Float	set point value	calibrated value	
298	Float	measure value	calibrated value	
300	Float	diameter value	calibrated value	
302	Float	line speed value 0-100%	calibrated value	
304	Float	AO1 output value	0-10v signal	
306	Float	AO2 output value	0-10v signal	
308	Float	regulation +/- 10V	0-10v signal	

Nota

1 **A = 1** if value = 256 or 768 or 1280 or 1792 or 2304 or 2816 or 3328 or 3840
B = 1 if value = 512 or 768 or 1536 or 1792 or 2560 or 2816 or 3584 or 3840
Init = 1 if value =1024 or 1280 or 1536 or 1792 or 3328 or 3584 or 3840 or 3072
Reg = 1 if value = 2048 or 2304 or 2560 or 2816 or 3328 or 3584 or 3840 or 3072

2 **AL1 =1** if value = 4 or 6
AL2 =1 if value = 2 or 6

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2.7 Command definition (write single register)

@ register	Type	Name	Command
320	Reg	memories command	0x8000 to 0x8004 : M1 to M5 reading 0x80FF : RAM reading 0xC000 to 0xC004 : M1 to M5 writing
321	Reg	display button locked command	> 0 Display locked, decrease 1unit /second
322	Reg	setting command	0x5501 : Calibration High value 0x5502 : Calibration low value 0x5503 : Calibr Diam min 0x5504 : Calibre Diam max 0x5505 : factory setting 0x5506 : Preset 0-10v scale 0x5507 : Tare

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3 Example

- 1- Configure DGT300+ for your application with DGT300+soft.
Once setting done, use this configuration as reference for future settings through PLC.
- 2- Create a buffer (holding registers) on PLC memories to receive DGT300+ parameters blocks.
We advise using at least 4 blocks in PLC data area:
 - 2 (or more) blocks for parameters from 0 to 233.
 - 1 block for acquisition parameters from 260 to 309
 - 1 block for command from 320 to 323
- 3- Connect DGT300+ to PLC
Refer to IP address, IP mask and IP gateway of the DGT300+ parameter
- 4- Download DGT300+ memory in buffer
Write 0x80FF in @320 (case of Ram reading instruction)

*Working directly with memory parameter is possible:
Write 0x8000 in @320 (Memory M1 reading instruction)*
- 5- Modify parameters (parameters setting up)
 - a-Modify parameters in buffer
Example set point value modification in @142
 - b- Download modified parameters in DGT300+
Write 0xC0FF in @320 (Ram writing instruction)

*Working directly with memory parameter is possible:
Write 0xC000 in @320 (Memory M1 writing instruction)*
- 6- Read data (data acquisition function)
Example read measure data.

Write 0x80FF in @320 (update reading block acquisition parameter from 260 to 309).
Read data in @298
- 7- Use setting command for calibration or Tare functions

Example Tare function
Write 0x5507 in @322