

Tel: +90-216 466 84 60 Fax: +90-216 364 65 65 datakom@datakom.com.tr http://www.datakom.com.tr

APPLICATION NOTE

Ethernet Configuration Guide for D-500 D-700						
PRODUCTS AFFECTED:	D-500 / D-700					
WRITTEN BY:	Metin Hekimoglu					
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Issue	02					

	Rainbow Plus D-500 D-700 Installation Guide
	Rainbow Plus D-500 D-700 Usage Guide
Related documents	Dynamic DNS Account Setting for D-500 D-700
	RainbowScada Installation Guide
	RainbowScada User Guide

Introduction

The D-500/700 unit offers a 10/100Mbits/s ethernet port as standard accessory. This document emphasizes the configuration of the ethernet port.

Through the Ethernet port, below features are supported:

-Web server

-Web client (used for dynamic dns update)

-Modbus over IP

-SNMP

- -SMTP (simple mail transfer protocol)
- -Central Monitoring

Ethernet connections



Connect the D-500/700 device to your local area network (LAN) with a standard ethernet cable.

	Ethernet Port Technical Specifications
Description:	IEEE802.3 compliant, 10/100 Base-TX RJ45 ethernet port with indicating leds
Data rate:	10/100 Mbits/s, auto detecting
Connector:	RJ45
Cable type:	CAT5 or CAT6
Isolation:	1500 VAC, 1 minute
_Max distance:	30m.
Functionality:	Embedded TCP-IP, Web Server, Web Client, SMTP, e-mail, SNMP, Modbus over IP

Ethernet port setup

The ethernet port setup is performed using the RainbowPlus program. The RainbowPlus installation and usage is explained in related documents. Only parameter setting will be referenced in this document.

- 1) Open the *RainbowPlus* program
- 2) Connect to the unit through USB
- 3) Select Configuration mode
- 4) Read parameters from device.
- 5) Select *Communication>Ethernet* tab. This page contains ethernet parameters.

Rainbow Plus (Version 1.8)	
File Tools Help	
Scada Configuration	Basic IP Settings Email DNS GSM Ethernet RS485
Module Generator Mains Engine Analog Inputs Digital Inputs	Ethernet Enable IP Address
Communication	Network IP 0 🜲 . 0 📚 . 0 📚 . 0 📚
IP Settings Email DNS GSM	Gateway IP 0 ♀ . 0 ♀ . 0 ♀ . 0 ♀ Subnet Mask 255 ♀ . 255 ♀ . 0 ♀
Ethernet RS485	

- Enable *Ethernet Enable* parameter. This parameter enables all IP services through ethernet port (web server, web client, SMTP, Modbus over IP, SNMP) after saving to the D-500/700 device.
- 7) Do not change *Network IP* section. The 000.000.000 setting causes the D-500/700 device to request an IP from the local network switch. If the local network switch is not DHCP server enabled (cannot give local IP) then this field is necessary. In this case write an IP address in the form 192.168.002.xxx in the Network IP field. (xxx denotes any number between 20 and 250)
- 8) Do not change *Gateway IP* section. The **000.000.000** setting causes the D-500/700 device to request the Gateway IP from the local network switch.
- 9) Do not change *Subnet Mask* section. The **255.255.255.000** setting allows 255 IP addresses in the local network.

10) Select *Communication>E-mail* tab. This page contains E-mail related parameters.

Rainbow Plus (Version 1.8)	
File Tools Help	
Scada Configuration	Basic IP Settings Email DNS GSM Ethernet RS485
Module Generator Mains Generator Mains Digital Inputs Digital Inputs Communication Basic IP Settings Email DNS GSM Ethernet RS485	Smtp Port 25 Mail Server Name mail datakom.com.tr Mail Account Name d500 Mail Account Password 123456 Email Email Email 6 Address 1 d500mail @ gmail.com
	Address 2 @ @
	Address 3 @
Read From Device	

- 11) SMTP field should be filled appropriately. This is the e-mail address from where the unit will send e-mail messages. The information is the same as used in a computer.
- 12) Select *E-mail on IP Change* parameter as required. If this parameter is enabled, the D-500/700 device will send an e-mail message each time the IP is changed.
- 13) *E-mail address 1 (2/3)* is the address to where e-mail messages will be sent. If emails are required, enter your e-mail addresses here. If e-mails are not required, then enter blank fields here. The unit can send up to 3 e-mails at once.
- 14) Select **Communication>Basic** tab. This page contains IP related communication parameters.

Rainbow Plus (Version 1.8)	
File Tools Help	
Scada Configuration	Basic IP Settings Email DNS GSM Ethernet RS485
Generator Generator Generator Generator Generator Generator Digital Inputs Digital Inputs Digital Outputs Communication Generator Gener	Modbus Slave Address 3 TCP/IP Port 502 Timer Web Refresh Rate Rainbow Refresh Rate
	Modem Selection Internal Baud Rate 57600 Engine
Read From Device	Serial Number Site Id GPRS DEMO

- 15) **Engine Serial Number** and **Site Id** information are used in the header of SMS and email messages for the identification of the genset sending these messages. Please enter these fields correctly for your ease of operation.
- 16) Do not change *Web Refresh Rate, Rainbow Refresh Rate* and *Ping Period* parameters.

Rainbow Plus (Version 1.8)	
File Tools Help	
Scada Configuration Configurat	Basic IP Settings Email DNS GSM Ethernet RS485 Web Control Enable ✓ Server TCP/IP Port 80 ♀ Programming Enable ✓ User IP Mask IP #1 255 255 255 IP #2 0 0 0 ♀ <
GSM Ethernet RS485 Read From Device	IP #3 0

- 17) **User IP Mask** parameters are used for restricting the external access to the embedded web server. Leave these fields unchanged as above for unrestricted access. Please consult **Datakom** for more details.
- 18) Rainbow Server Adresses are used for RainbowScada remote monitoring program. If RainbowScada program is installed, the IP address (or domain name) of the central monitoring PC should be entered. If only one center is used, enter both addresses the same. Set the Rainbow Server Port to the same value set in the RainbowScada program.
- 19) Select **Communication>DNS** tab. This page contains dynamic DNS update information.

Rainbow Plus (Version 1.8)	
File Tools Help	
Scada Configuration	Basic IP Settings Email DNS GSM Ethernet RS485
Module Generator Auios	Dynamic DNS
⊞ - Engine	Domain Name d500.dyndns-ip.com
 Analog Inputs ■ Digital Inputs 	IP Confirm. Addr. checkip.dyndns.org
Digital Outputs	Membership Addr. members.dyndns.org
Basic IP Settings	Ping Address www.google.com
Email	User Name bahabur
<mark>DNS</mark> GSM Ethernet	User Password 23753313
RS485	

- 20) *IP Confirmation address* and *Membership Address* fields should not be modified and must be left as per above settings.
- 21) **Ping Address** may be set as required. But above address is the most reliable one. It is advised to leave it unchanged as above. This address is used for the verification of internet connectivity.
- 22) Domain Name, User Name and User Password are necessary for using the dynamic dns service. The account creation is emphasized in Dynamic DNS Account Setting for D-500 D-700 document. These parameters are created while opening a dyndns account.

23) When parameter editing is over, click *Write To Device* button. A progress bar will open.

Rainbow Plus (Version 1.8)		
File Tools Help	Pagin IB Settings Email DNS GSM Ethorpot DS405	
Scada Connguration Module Generator Mains Engine Analog Inputs Digital Inputs Digital Dutputs Communication Basic IP Settings Email DIS GSM Ethemet RS485	Basic IP Settings Email UNS GSM Ethernet RS485 Dynamic DNS	
Read From Device Read From File Write To Device Write To File	Write To Device button	Progress bar
🕴 Data Ready 🌒 Tx 🧿 Rx 🌒	•< <u>+</u>	Device ID: D500 - HW Ver: 2.0 - SW Ver: 2.5

24)When the progress bar disappears the write process is done.

Access to Embedded Website

The easiest and most stable access is performed through <u>Static IP address</u>. Please check your <u>webmaster</u> for the availability of static IP address.

<u>If static IP is available</u>, the embedded web page is simply open by writing *http://<IP address>* on your browser's address bar. The IP address is constituted by 4 numbers separated by points.

Example: *http:// 78.179.212.6*

If static IP is not available, then the use of dynamic dns service is necessary. A dynamic DNS account should be open and data should be set in the device as explained in this document.

The device will record its current IP address to the dnydns account and the access will be made by writing the **<domain name>** in the browser address bar. Example: *http://datakom-d500.dyndsn-ip.com*

The embedded web server allows both monitoring and control of the device. A sample digital monitoring page is below.



A sample counter display page is below:

🖉 Datakom Web Scada				
WEB Scada				
Measurements Counters	Events	Alarms	Parameters	
COUNTERS				
Engine run	16 hrs			
Engine crank	9			
Genset On Load	0 hrs			
Total engine run hrs.	384 hrs			
Engine hours to service 1	127 hrs			
Engine days to service 1	171 days			
Engine hours to service 2	0			
Engine days to service 2	0			
Engine hours to service 3	0			
Engine days to service 3	0			
Total kilowatt hours	13002			
Total kilovar hours (i)	496			
Total kilovar hours (c)	182			

Sample Event Log file. Last 15 events are available in the embedded web server.

iom We	eb Scada																Home 🔹	5
WEB Scada																		
Mea	suremen	ts Co	ounters	Eve	ents	Al	arms.	Par	amete	rs								
##	Event	Alarm	Date Ti	ime Mode	State	Mains L1	Mains L2	Mains L3	Mains Frq.	Genset L1	Genset L2	Genset L3	Genset Tot Pf	Genset Tot Act. Pow.	Genset Frq.	Oil Pressure	Eng. Tmp.	>
0	Per.Rec.		10-05-201 16:00:00	L2 OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.0Bar 58psi	34 °C 93 °F	
1	Per.Rec.		10-05-201 15:00:00	OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.0Bar 58psi	34 °C 93 °F	
2	Per.Rec.		10-05-201 14:00:00	L2 OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.0Bar 58psi	34 °C 93 °F	
3	Per.Rec.		10-05-201 13:00:00	OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.0Bar 58psi	34 °C 93 °F	
4	Per.Rec.		10-05-201	L2 OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.0Bar 58psi	34 °C 93 °F	
5	Per.Rec.		10-05-201 11:00:00	0FF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.0Bar 58psi	34 °C 93 °F	
6	Per.Rec.		10-05-201	L2 OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.1Bar 59psi	34 °C 93 °F	
7	Per.Rec.		10-05-201 09:00:00	OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
8	Per.Rec.		10-05-201 08:00:00	OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
9	Per.Rec.		10-05-201 07:00:00	OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
10	Per.Rec.		10-05-201 06:00:00	L2 OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
11	Per.Rec.		10-05-201 05:00:00	OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
12	Per.Rec.		10-05-201 04:00:00	L2 OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
13	Per.Rec.		10-05-201 03:00:00	0FF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
14	Per.Rec.		10-05-201	L2 OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	
15	Per.Rec.		10-05-201 01:00:00	OFF		0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	4.2Bar 60psi	34 °C 93 °F	~
<																	>	

A sample alarm list.

🖉 Datakom Web Scada					1
WEB Sc	ada				
Measurements	Counters	Events	Alarms	Parameters	
ALA Engine ShutDow End of Alarm L	RM TYPE n Low Fue ist	ALAR 1 Level	М		

Programming is avalable with password entry. The password is "9876".

Chttp://192.168.2.4/set.shtml	🚹 Home 🔹 🕥 Feeds (J) 👻 🖃 Read Mail 👼 R
	Login
	Enter

Various parameters are available for web programming. Change the value then click **Set** button.

WEB Scada		
Measurements Counters	Events Alarms	Parameters
Controller Config	uration	Electrical Parameters
LCD Contrast [] 39	Set	Current XFMR Primary 500 Set
Screen Scroll Timer 10 [sec.]	Set	Voltage XFMR Ratio 1.0 Set
Language Selection []	<mark>Set</mark> .	Nominal Voltage [V] 230.0 Set
Genset Default Disp. []	Set	Nominal Frequency 50.0 Set
Status PromptsEnable 0 🌱	Set	Nominal Voltage 2 120.0 Set
Fault Holdoff Timer 12 [sec.]	Set	Nominal Frequency 2 60.0 Set
Alarm Relay Timer [sec.]	Set	न्त्रक दिया ≚
Intermittent Alm Rly	Set	Engine Parameters
Emergency Backup	Set	Engine Start Delay [sec.]
Exercise Enable	Set	Preheat Timer [sec.]
Exercise Period	Set	Engine Heating Timer [sec.] 4 Set
Exercise Off/On Load	Set	Engine Heating Meth. []
Delayed SimulateMain	Set	Cooldown Timer [sec.] 120 Set
Modem Selection	Set Set	Fuel Tank Capacity [lts.] 0 Set
11500	n 🐱 Set 🗹	

Central Monitoring

The RainbowScada program will allow the central monitoring of a large number of gensets through internet.

Please read documents on RainbowScada installation and Rainbow Scada usage for more details.

A sample Rainbow Scada screen is below.



The program represents each unit as a coloured box on the map. The map is downloaded from the internet. The colour of the box will indicate the genset status for easy follow_up of the whole network.

An additional status and address bar at the right side of the screen will show the system structure and status.

Information E-mail Messages

The D-500/700 is able to send an e-mail message when the Ethernet IP number is changed.

This message is enabled or disabled by below program parameters: Communication>Options1>Miscallenous>E-mail on IP Change

۹ sa	ample	e mes	sage is	Delo															
-	Message	lnsert	Options Forma	1 It Text	Table Tools Design	Lavout				D50	0 Notify -	Message (HTML)						
Paste	 ✓ Cut ☑ Copy ✓ Format P Clipboard 	Painter	s Nei v 12 v A I U 2 A Basic T	t a*) ⊞ ■ ■ ext	- ;= - (₹ =) ;= 1	Addres Book	s Check Names	Attach A File	ttach Busir Item Carr Incl) ness Calend d → ude	ar Signature	Follow Up *	Permissi Pigh Im Low Imp Options	on * A portance ortance © Pro	BC elling ofing				
This m	essage will b	e sent via data	kom@datakom.com.	tr.															
Sand		<u>d500ma</u>	il@gmail.com																
Accourt	at τ Bcc																		
Account	S <u>u</u> bje	ct: D500 N	otify																
Seria WA	al Numbe N Ip: 95. S Ip: NA	er: 14.149.18	3	\leq	INE	w IP	IS II	ndic	ated	her	e								
Seria WA GPR	al Numbe N Ip: 95.7 S Ip: NA	0 Eve	ents	_		w IP	IS II	ndic	ated	l her	e								
Seria WA GPR	al Numbe N Ip: 95. S Ip: NA	0 Eve	Date Time	Mode	State	Mains L1	IS II Mains L2	Mains L3	Ated Mains Frq.	Genset	Genset	Genset L3	Genset Tot Pf	Genset Tot Act. Pow.	Genset Frq.	Oil Prs.	Eng. Tmp.	Fuel Lvl.	Oil Tmp.
Seria WA GPR La	al Numbe N Ip: 95. S Ip: NA nst 1 Event	0 Eve Alarm	Date Time 02-01-2000 04:12:28	Mode	State Mains Failure	Mains L1 201 V	IS II Mains L2 0 V	Mains L3 201 V	Mains Frq. 49.9 Hz	Genset L1 202 V	e Genset L2 201 V	Genset L3 201 V	Genset Tot Pf 0.64	Genset Tot Act. Pow. 42 kW	Genset Frq. 49.9 Hz	Oil Prs. 3.5Bar 50psi	Eng. Tmp. 50 °C 122 °F	Fuel Lvl. 60 %	Oil Tmp. 71 °C 159 °F
Seria WA GPR L:	Al Number N Ip: 95. S Ip: NA ST 1 Event Per. Rec.	0 Eve Alarm	Date Time 02-01-2000 04:12:28 02-01-2000 04:00:00	Mode OFF OFF	State Mains Failure Mains Failure	Mains L1 201 V 0 V	IS II Mains L2 0 V 0 V	Mains L3 201 V 0 V	Mains Frq. 49.9 Hz 0 Hz	Genset L1 202 V 0 V	e Genset L2 201 V 0 V	Genset L3 201 V 0 V	Genset Tot Pf 0.64 0	Genset Tot Act. Pow. 42 kW 0 kW	Genset Frq. 49.9 Hz 0 Hz	Oil Prs. 3.5Bar 50psi 3.5Bar 50psi	Eng. Tmp. 50 °C 122 °F 50 °C 122 °F	Fuel Lvl. 60 %	Oil Tmp. 71 °C 159 °F 72 °C 161 °F
She Seria WA GPR	Al Number N Ip: 95. S Ip: NA AST 10 Event Per. Rec. Per. Rec.	14.149.18	Date Time 02-01-2000 04:12:28 02-01-2000 04:00:00 02-01-2000 01:00:00	Mode OFF OFF	State Mains Failure Mains Failure Mains	Mains L1 201 V 0 V 0 V	IS II Mains L2 0 V 0 V 0 V	Mains L3 201 V 0 V 0 V	Mains Frq. 49.9 Hz 0 Hz 0 Hz	Genset L1 202 V 0 V 0 V	e Genset L2 201 V 0 V 0 V	Genset L3 201 V 0 V 0 V	Genset Tot Pf 0.64 0	Genset Tot Act. Pow. 42 kW 0 kW 0 kW	Genset Frq. 49.9 Hz 0 Hz 0 Hz	Oil Prs. 3.5Bar 50psi 3.5Bar 50psi 3.5Bar 50psi	Eng. Tmp. 50 °C 122 °F 50 °C 122 °F 50 °C 122 °F	Fuel Lvl. 60 % 60 % 60 %	Oil Tmp. 71 ℃ 159 °F 72 ℃ 161 °F 72 ℃ 161 °F

Last 10 event logs together with measured parameters are always appended to the e-mail message.

Alarm E-mail Messages

The D-500/700 sends an e-mail message when any fault condition occurs.

A sample message is below:

	Message	▲ ♥ ₹ Insert Opt	ions Format Te	xt						D500	Notify - M	essage (Hī	īML)					
Paste	∦ Cut ⊑⊇ Copy ∛ Format P Clipboard	Painter	× 12 × A ∧ <u>U</u> ab2 × A → Basic Text	ĭ) (= ∙ ■ = =		Address (Book N Name	Check A lames	Attach Atta File Iter	ch Busines n Card * Includ	calendar e	Signature *	Follow Up + C	 Permission High Impo Low Impor ptions 	n • AB ortance tance © Proo	ý ing fing			
This n	nessage will b	e sent via datakom	@datakom.com.tr.															
	T 0,	d500mail@q	mail.com;															
Sen		<u> </u>																
Accou	int - Bcc																	
	S <u>u</u> bje	ct: D500 Notify												1				
Seri ENG	al Numbe GINE SHI ast 1	utdown ei 0 Even	mergency Stop ts	p				Las	t ev	ent l	og gi	ives	mea	sured	valu	ies		
##	Event	Alarm	Date Time	Mode	State	Main	L2	L3	Mains Frq.	Genset L1	Genset L2	Genset L3	Genset Tot Pf	Genset Tot Act. Pow.	Genset Frq.	Oil Prs.	Eng. Tmp.	Fuel Lvl.
0	Shtdwn	Emergency Stop	02 <u>-01</u> 2000 04:58:58	OFF	Mains Failure	0 V	0 V	0 V	0 Hz	0 V	0 V	0 V	0	0 kW	0 Hz	3.5Bar 50psi	50 °C 122 °F	60 %
1			02-01-2000 04:12:28	OFF	Mains Failure	201 V	0 V	201 V	49.9 Hz	202 V	201 V	201 V	0.64	42 kW	49.9 Hz	3.5Bar 50psi	50 °C 122 °F	60 %
	_		02 01 2000		Maina											2 5 Dec	E0.00	

Last 10 event logs together with measured parameters are always appended to the e-mail message.

Troubleshooting

The ethernet connection status is monitored at Ethernet screen pages.

In order to display the Ethernet screen pages press Right or Left Arrow buttons of the D-500/700 device until below screen appears.

More ethernet screens are available. They are accessed by pressing \heartsuit_{and} buttons of the D-500/700 device.

Connection status indicator ETHERNET	SCRE	EN	IP address of the unit, assigned by the network
• IP:192.1	68.	2.95	Total data
R× 28031 T× 260405	10 55 07-69	tes tes	bytes received
Data Receive and Transmit Indicators		T	Total data bytes ransmitted





Connection Status Indicators (

This icon displays if the network cable is connected. When the cable is not connected, an unplugged icon will replace the plugged icon.

IP Address:

This field shows the IP address granted by the local network switch.

Data Receive and Transmit Indicators:

These indicators flash when data is received (or transmitted) through ethernet network. Simultaneously data counters are updated.

Data Counters:

These counters increment with data received (or transmitted) through the ethernet port. The ethernet activity is precisely monitored with these counters.

Gateway IP address:

This field shows the IP address of the local network switch.

Client IP address:

This field shows the IP address of the remote web client accessing the web server through ethernet. Only the last client is displayed.

WAN IP Address:

This field shows the real IP address of the network switch.