remote operation

·-- 0 3 3 0×

rotork

034 0

rotork

rotork

Established Leaders in Actuation Technology

netuork remote operation unuuuuuuuuu.

-1-33-3 Gorge



Pakscan Ethernet

network and internet actuator control

Publication S118E issue 11/04

rotork[®]

Pakscan Ethernet Network and Internet actuator control

Ethernet is the most popular network for communication of data in use in the world today. The staggering growth of this technology has now reached into the area of industrial controls and automation. Many DCS and PLC systems rely on an Ethernet connection between the gateways and controllers used in constructing the control system; Ethernet backbones to control systems are becoming commonplace.

The Pakscan Ethernet connection lets this technology reach right down to the control of valves and actuators by linking the well established Pakscan system to a Local Area Network or the Internet. The Ethernet connection's high speed and wide bandwidth lets multiple users gain controlled access to the same actuator for control and diagnostic purposes at any time.

Pakscan Ethernet is pre-engineered to provide "Plug and Play" installation that automatically collects the status and alarm data about the connected actuators and field devices. This data is instantly available at the communications connection.

The embedded web server provides access to all the information available from the system, as well as configuration and diagnostic information via pre configured dynamic web pages.

Email notification is included to automatically notify appropriate personnel of selectable events indicating alarm conditions or maintenance is needed.

Security is ensured at all times by a fixed unique internet address and limiting access to password protected areas of the browser. Normal Modbus TCP communications is protected by standard firewall technology.







MODBUS TCP





Pakscan Field Network

The actuators are connected together in the plant by a 2 wire twisted pair cable linking them in a series loop. The single fault tolerant 2 wire twisted pair digital network is the backbone of the Pakscan system.

- Plug and play installation
- Low cost of ownership
- Increased plant productivity
- 20 km distance capability
- Up to 240 field units
- No repeaters required

Fault Tolerant

All Pakscan systems are inherently fault tolerant. In the event of a single open, short or ground fault on the field cabling the unique Loopback facility automatically isolates the faulty cable segment. The system then continues to communicate with all the connected actuators. Inherent network diagnostics provide quick and easy identification of the location and type of network fault.

- Loopback mode
- High reliability field units
- Hot standby master stations
- Inclusive of lightning protection

Master Station Integrity

Modular design and pre-engineered functionality ensure the master station reliability. The inbuilt display and keypad allows simple on site diagnostics and set up alteration.

- Continuous monitoring of the 2 wire loop
- Monitors actuator availability
- Permits field unit parameterisation
- Alarms on loss of field device

Modbus TCP

Industry standard Ethernet protocol, Modbus TCP provides the ideal format for data exchange to and from the Pakscan system.

- Supported by all major PLC and DCS vendors
- Industry standard protocol
- Ideally suited to Ethernet

Multiple Data Format

Two data formats are available for transmission by Modbus TCP. The most popular formats previously supported on the Modbus RTU communication link are retained for Pakscan Ethernet comms.

Control and Data

Data requests are served from the system's internal data base ensuring minimal message turn round times. The data base is continuously updated with the status of the field equipment.

Commands are prioritised and pass directly to the actuators and valves.

- Transparent to commands
- Services data requests from internal data base
- Simple to configure

Ethernet LAN

Signals are transported over the LAN using standard Ethernet components. The LAN can include hubs, switches, routers and other users as well as the dedicated valve control system

- Industry standard LAN
- Standard components used

World Wide Web

The embedded web server allows information to be displayed over any LAN or the Web using TCP/IP and standard web browser technology.

- Embedded Web server
- Full actuator control and reporting

The embedded web server provides a graphical interface to the system through pages showing system status, user diagnostics, system configuration and field unit setup using any Web Browser software such as Microsoft Internet Explorer.

Control of field devices is also allowed to users with sufficient access rights. These pages run concurrently with the host Modbus TCP communications and use TCP/IP protocol.



Security Access

The web server includes 3 levels of customer configured user name and passwords to restrict access to the system and user privileges.

- Administrator
- Operator
- Viewer

The lowest level (Viewer) can observe the system only, whilst an Operator can make changes to the actuator position and Pakscan system settings. Administrators can set up the whole system, including the email facility.

Master Station Status

The master station status page provides an overview of the status and health of the Pakscan system. Visual indications of the field network condition, master station health, internal processor integrity and presence of alarms are displayed.

- System condition
- Reset loop

Field Unit Organisation

A dynamically constructed list shows all the connected field units together with their tag name and actuator type. Any alarm on any actuator is visible from this screen and it provides the route to the individual actuator status and control screens. The list automatically updates to reflect any changes to the system.

- Dynamically updated
- Complete Tag list of the connected valves
- Actuator type identified
- Pending alarm indication

Actuator Status

Clicking on the 'FCU Control' button opens up a web page showing the current status of the actuator including any alarms that may be present.

The actuator may be opened or closed, or set to an intermediate position from this screen provided the user has suitable access rights.

- Current condition of the actuator
- Control the actuator position
- Select the alarm or torque (on IQ) screen





		5 00		~	
ut Bridge m Marterst	latheon Cook Rig	Performet Blag	nertics PCD Nene	RUPA	attet fars Adam
		FCU Me	inv		
	ddress	Teg	Tepe	Alarm	Nevigation
100	1	33333	10/307	0	FCU Control
	z	875863	30 Analogue	0	(FCU Control
	3	NOV3	TPEQI	0	(FCU Control)
	4	240344	TQ/TQT	0	FCU Currel
	3	HOUS	10/101	0	FCU Central
	4	DANI	Integral	0	(RCU Central
	7	MINEY	(Integral	0	FCU Control
		4452	Integral	0	FCU Convel
	4	dan2	Integral	0	ERCU Centrel
	10	3_WZ_3	GPFCU · GP	0	FCU Control
	.11	1234	Integral	0	(RCU Cannot
	12	NIPRO	GPTCU + GP	0	(PCU-Central)
	12	QL	GRECU - GR	0	(PCU Coveral
	14	34/7597.w	GPECU - GP	0	FCU Central
	15	manber15	GHTCU - GP	0	FCU Canval





Actuator Alarms and Diagnostics

The Actuator Status screen includes additional pop up windows to show alarm and torque data. Alarms may be accepted by clicking the Alarm Accept button and the indication will return to normal if they are no longer present. The actuator Torque profile can also be displayed from the status screen and this gives a chart showing torque versus position.

- Alarm latch and Accept facility
- Torque profile

rotork		50		- Mary		0
Ratestates Rate	estation Cooling	Nettenet BL	-geortics	PCO Name PCO P	ananatara Adam	Ant
	N	ehvork Diogne	refice			
Stat	us Informatio	•••		-	Fault Inform	ation
No of devices on loop 03 No of FCU's found on system 17			Last loop reset	Initiated by	gure command received	
Leop Status	tatus Lospback in Use		Loop fault type		Loop oper circuit	
Loop Baud Rate			Z400	No of FEU's an	A side	9
Loop config status	eop cenfig status Configuration campints		arolata.	No of FCU's am	8 side	0
	Testing	(94	ing map	Facet Loop	Tan	
	- FURNER.	11	-1	Unknown	P56-1020	
				Tabaccal	153.172	
	2	12	0	GPFCU · CP	F56-002E	
		12	0	GFFCU - GP	PSE-002E PSE-001A	
	3	12 13 24	0 0	GPECU - GP GPECU - GP GRECU - GP	PSE-OG2E PSE-OGLA PSE-OGLB	
	2	12 13 24 15	0 0 0	GPECU - GP GPECU - GP GPECU - GP GPECU - GP	P36-0021 P36-0018 P56-0018 P56-0018	
	2 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	12 13 24 15 26	0	GPECU - GP GPECU - GP GPECU - GP GPECU - GP	P56-0021 P56-0018 P56-0018 P56-0010 P56-0010	
	2 2 4 7 8	12 13 24 15 26 17	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GFFCU - GF GFFCU - GF GFFCU - GF GFFCU - GF GFFCU - GF GFFCU - GF	P36-002E P36-0018 P56-0018 P56-0018 P56-0010 P36-0011	
		12 13 24 15 26 17 20	0 0 0 0 0 0 0 0	GFFCU - GF GFFCU - GF GFFCU - GF GFFCU - GF GFFCU - GF GFFCU - GF	P34-0021 P34-001A P54-001A P54-001B P54-001C P34-001C P34-001C	
	2 3 4 5 7 8 9 10	12 13 24 15 26 17 20 9	000000000000000000000000000000000000000	GPECU - GP GPECU - GP GPECU - GP GPECU - GP GPECU - GP GPECU - GP Integral	F36-0022 F36-0018 F56-0018 F56-0010 F36-0010 F36-0010 F56-0020 F36-0020	
	2 3 6 7 8 9 10 11	12 13 24 15 26 17 20 9 5	000000000000000000000000000000000000000	GPFCU - GP GPFCU - GP GPFCU - GP GPFCU - GP GPFCU - GP GPFCU - GP Integral 20/107	PSE-0022 PSE-0023 PSE-0013 PSE-0010 PSE-0010 PSE-0020 PSE-0020 PSE-0020 PSE-0020 PSE-0020 PSE-0020 PSE-0020	
	2 3 4 5 7 8 7 8 9 10 11 12	22 23 24 15 26 17 20 9 2 8	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GPPCU - GP GPPCU - GP	PSt-0021 PSt-0018 PSt-0018 PSt-0010 PSt-0010 PSt-0010 PSt-0020 PSt-0020 PSt-0021 PSt-0021	
	2 3 6 7 8 9 9 10 11 11 12 12	12 23 24 26 17 20 9 5 0 7	000000000000000000000000000000000000000	GPPCU - GP GPPCU - GP GPPCU - GP GPPCU - GP GPPCU - GP GPPCU - GP GPPCU - GP Integral Totheoral Integral	PSE-0022 PSE-001A PSE-001A PSE-0010 PSE-0010 PSE-0010 PSE-0010 PSE-0020 PSE-0020 PSE-0020 PSE-0020 PSE-0021 PSE-0021 PSE-0021 PSE-0021	

Network Diagnostics

The powerful Networks Diagnostic function automatically develops an 'as wired' field network map showing the physical connection order of all the field devices on the Pakscan loop. It also shows the current status of every actuator's communications and current performance of the system.

Should a field cable fault occur the nature of the fault is indicated and

its position is shown by shading the two addresses in loopback. This provides a quick and efficient fault identification minimising repair down time.

- Full loop map
- Comms Failure counts for every actuator
- Position of any loopback faults

4-BADL +	2 Oberth Grantes Oreca	3 3-33	• 🖃 🛛 Google •	- 10
rotori k Masa Tarat Briga		The second	0	
Macherstation Macherst	Configuration	None PCD Paramet	ters Admin Area	
-	and the second second second			මො
	Master Station Information			
	She name		Area 3	71 - Tark Farr
	Taginame			TRIBBUE
	Modbus address		Seo/IN N/A	Peer 7 N/A
	Senal ESD			enabled x
	Keyped ESD			Enabled .
	Hardwired COD			Enabled x
	Pin 3023	Hut in and at	beringer for	-
	Haster type		111 36	Hot, Handley 20
	Number of channels			212 -
	Processor andware version			
	Loop driver software version			5.2
	Z Wire Loop Cenfiguration			
	Number of field units			17
	Loop speed			2436 -
	Leop speed doubling			CH a
	Ratain data on less of communi-	rations		01 +
	DVI nervent			C# .

Master Station Configuration

The settings for the master station, including the number of field units and loop speed, are editable from this screen. Only users with 'Administrator' access permission can make alterations. The tag name and communications settings can also be altered here. A print function is included to allow a permanent record of the settings to be kept.

- Port configuration
- Loop configuration
- PIN number
- Hot standby parameters



Field Unit Parameters and Settings

Every field unit has a number of parameter settings that determine its performance. If these are not correctly set then some features of the control system or the actuator will not be available for the end user. These screens allow the settings of all the field unit parameters to be examined.

- Actuator type
- Software version fitted
 - Complete configuration details of actuator system related parameters

Automatic Email on Alarm

The system is able to automatically generate messages by email to specified recipients. These messages will send information relating to specific alarms generated on the system. For example the maintenance supervisor could be sent a message if the system develops a field network fault. The configuration of this feature requires Administrator access. Each user has their own set of email generation instructions lodged in the Pakscan system.

- Alarm event cause email generation
- Date and time stamped
- Destination of email programmable

rotorit	-	1: 0	
Harterstellen Hert	Alarm	ICE How ICE Parameters Admin Ame Unor tarbowit Social	Alam
t-med Option Indef Inde Path IdTD Genor	6 da Carl	Logida Linhamm Logida Linhamm Common Andre Mit Alem Common Andre Mit Alem Status Colonia Anne Status Coloni Inschler Logi Common Anne Logi Common Anne Logi Common Anne Logi Common Anne Alem Tanta Ferrer annesi Markotola Lina Alem Tanta Alem Status Yok Robertstein VCK	BBBBCLLLLLBLLL



Authorisation

The Pakscan Ethernet connects to an Ethernet Local Area Network. User security can be maintained on that connection in a number of ways. For absolute protection the Ethernet connection should be kept to a specific LAN for actuator control use on the installation.

LAN Connection

If the LAN is kept as an Intranet with no external connection then only authorised users of that Intranet will be able to view the Pakscan data. The Intranet firewall will prevent the Pakscan equipment from being accessed from outside the LAN.

Internet Connection

If the Pakscan Ethernet is connected to a LAN and suitable router with onward connection to the Internet or World Wide Web then the router must be set up with some protection against unwanted intrusion onto the LAN. The control data uses Modbus TCP that in itself provides security since most routers will not have their Modbus TCP port enabled.

Web Server

Access to the web server is protected by three levels of password. These must be securely kept and should periodically be changed to ensure against malpractice.



Pakscan IIS Ethernet Master Station Option

With a Pakscan IIS Ethernet master station a single Ethernet connection is provided for Modbus TCP to the host system over the LAN. The system is fully pre-configured for data collection and transmission and the engineering required to complete the settings for each system is minimal, comprising the IP address and simple data settings.

PS610 – A separate enclosure housing the additional components to give the Pakscan IIS Ethernet master station an Ethernet connection. The two configurable RS232/RS485 ports of the master station are also available.

Dedicated Interlocking

With Ethernet many potential points of control are possible. Interlocking or 'control permissive' can be difficult to implement. The Pakscan IIS master station includes a dedicated interlocking facility to ensure control conditions are satisfied for all potential points of control.





PS610 Option

COMPATIBILITY

Pakscan IIE Ethernet Master Station Options

In the case of a Pakscan IIE Ethernet master station, one or two Ethernet connections are available. For hot standby systems a common connection to both stations is provided. As with the IIS, the system is fully engineered connectivity and integrates seamlessly with PLC, DCS and Rotork's In-Vision.



Single Pakscan IIE Ethernet master station

P5601 – Ideal for single master stations, this option includes an Ethernet output plus an RS232 port which can be used for serial communications.

PS602 – A second alternative for single master stations, in this option the Ethernet output is supplemented by an RS485 port. The RS485 port allows a conventional serial highway to be used in addition to the Ethernet highway.

PS603 – When dual Ethernet communications are required from a single master station, this is the option to choose. Two Ethernet ports are included.

Hot Standby Pakscan IIE Ethernet master station

PS604 – For Hot Standby Pakscan IIE Ethernet master stations this is the option to choose. Either one or two Pakscan Ethernet ports are provided. When PS410 converters are fitted there can be both RS485 and Ethernet connections, or two Ethernet connections for dual host communication.













In-Vision LAN Web Browsei DCS Ethernet RS232 RS232 In-Vision LAN Web Browser Ethernet R5489 In-Vision I AN 1 I AN 2 Web Browser DCS Etherne



Pakscan IIE and IIS upgrades

Rotork has developed a field upgrade modification kit to enable customers with existing Pakscan systems to incorporate the Ethernet technology and web server.

The Pakscan master station software must be compatible with the upgrade kit. In the case of Pakscan IIE units the version of software must be V5.8/V5.2 or higher and for Pakscan IIS units the software must be V3.1/V5.2 or higher to maintain full functionality.

The upgrade kit can comprise PS610 assemblies for external connection or new master station hardware for integral assembly.

Pakscan Ethernet Option

Common:

Ethernet Port:	RJ45, 10Base-T or 100Base-Tx (IEEE 802.3)		
IP address:	user set during configuration		
Protocols:	Supports Modbus TCP for data exchange and TCP/IP for Web Server		
Comms Connec	tions: Max of 10 simultaneous Ethernet connections		
Email:	Supports email generation on alarm detection. (Requires SMTP server).		
Environmental:	Operating temp 0 to 50°C Storage temp –10 to +70°C Humidity 5% to 95% RH, non-condensing		
Password Protec	ction:		
3 levels	Read Only – read data from the plant and bridge Read/Write – read data and control outputs Administrator – read, control outputs and set configuration parameters		
Web Server:	Requires system to use Generic Data base setting		

Module Options:

For Pakscan IIE Systems -

PS601

A single Ethernet connection from each PS100 module, with an additional RS232 port

PS602

A single Ethernet connection from each PS100 module, with an additional RS485 port

PS603

Two Ethernet connections from each PS100 module

PS604

A single Ethernet connection common to both PS100's in a hot standby system. A second port (RS232 or RS485) is also available. (For RS485 two PS410 converters must be fitted).

For Pakscan IIS Systems -

PS610

A stand alone assembly with an RS232 port for connection to the Pakscan IIS master station

Connections:	Screw clamp terminals for the RS232 connection, RJ45 for the Ethernet connection. Lever clamp terminals for the power supply (0.5mm max)
Power supply:	100 to 260V, 50/60 Hz, fuse 1 amp
Dimensions:	278(w) x 188(d) x 130(h) mm



UK head office Rotork Controls Limited telephone Bath 01225 733200 telefax 01225 333467 email mail@rotork.co.uk

A full listing of our worldwide sales and service network is available on our website at **www.rotork.com** USA head office Rotork Controls Inc telephone Rochester (585) 328 1550 telefax (585) 328 5848 email info@rotork.com

As part of a process of on-going product development, Rotork reserves the right to amend and change specifications without prior notice.

Published data may be subject to change.

For the very latest version release, visit our website at www.rotork.com





Rotork Controls Inc, Rochester,

The name Rotork is a registered trademark. Rotork recognizes all registered trademarks. Published and produced in the UK by Rotork Controls Limited.