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Using OIT500 with Ethernet/IP

Introduction

The Pepperl+Fuchs OIT500 is a code plate reading system designed for high temperatures up to 500°C. The code plates that can be used are model numbers OIC... You can also make your own code plates. Contact Pepperl+Fuchs for details.

Ethernet/IP

The OIT500 only has an Ethernet TCP/IP interface. It does not however directly support Ethernet/IP. In order to talk Ethernet/IP use the converter RTS-UP... unit to convert the TCP/IP data to Ethernet/IP. The Ethernet/IP data will be placed directly into the PLC memory. No ladder logic programming will be required.

<u>RTS-UP-1</u> – Converts one serial and one Ethernet device to Ethernet/IP <u>RTS-UP-4</u> – Converts four serial and four Ethernet devices to Ethernet/IP

This document will show you step by step how to read and write to the MTT devices using Ethernet/IP

Configure the OIT500

Set IP Address

The first thing to do is to configure the Ethernet settings of your OIT system. Here are the default parameters.

Default Ethernet Settings:	IP Address:	192.168.0.65
	Subnet Mask:	255.255.255.0

To change the IP address set your IP address of your PC to one similar to the default. For example set your PC to 192.168.0.64. Then use the <u>OITControl</u> software to change the IP address.

In the OITControl software, first logon as an administrator. Choose Configuration > User Administration > Select User.



Choose Pepperl+Fuchs Administration and enter password "pfadmin"

select	user X
&	Actual user will be logged out; another user can log on. Further actions are restricted to the new permission-level.
	Username Pepperl+Fuchs Administration Password ******
p	fadmin OK Abbruch

Now connect to the OIT500 using the File > Connect to OIT system.



Choose OK

Connec	ct to OIT system	×
2	OITControl makes it possible to establish a connection to the OIT system. After selecting one of the OIT systems from the list and confirmation, the connection is established automatically. Alternatively, you can connect to a defined OIT system by entering the IP address. To do so, enter the IP address, if necessary with the declaration of the port number of the selected OIT system, for example 192.168.0.65 : 10050	10,050 🛬
	OIT system accessible	
	Link Connection	
	Acknowledgement of OIT system	
	ОК	Abbruch

To change the IP address go to the menu option Configuration > OIT system configuration.

oITControl (172.18.30.168 : 10050)				
File Edit View	Configuration ?			
21 23	💫 User administration 🔹 🕨			
	💰 Conform Logging			
-OIT read cycle-	OITControl configuration	I-Mess		
Read error	OIT system configuration	ıs		
😑 ID valid	🚿 Commissioning	too b		
PLC read cycle-	IT-System rebooten	too d		
😑 Reset	OIT system time 🔹 🕨	ny str e betr		
🖯 Start readii 😑 Data valid	System-Logging	e bet		

Enter the new IP address, subnet mask, and gateway and press "Write parameter data". Once you are done. Cycle power on the OIT500 and reconfigure your PC network settings. To verify that the OIT500 has the right IP address, ping the device from your command prompt.



Configure OIT500

The OITControl software can also be used for configuration. The only configuration parameters available are the camera shutter time and the camera gain. Use the default settings unless it is necessary to change them. This menu is in Configuration > OIT System Configuration > Image/test TAB. In this menu you can also write all of the system parameters and IP address configuration to a DATAMatrx code. This code can be used to configure replacement readers.,

Network RFC1006 OIT telegram Control telegram Image/test Evaluation image Image acquisition Camera shutter time : 2,000 ÷ Camera shutter time : 2,000 ÷ Camera amplifying : 150 ÷ Direct PLC read : Image of the sector Image of the sector Verification Set TNR bit : Image of the sector Image of the sector Image of the sector Max. permitted identical code : 0 ÷ Image of the sector Image of the sector Illumination Illumination : Image of the sector Image of the sector Image of the sector
External illumination :
Data carrier Coded papel type : 00 : Default Code (mirrored)
Code parer (pp 1) or Der date Code (min for day) for min for day
Parameter byte 0
Lock parameterization Daylight saving time ON
□ Bit 0.2 □ Bit 0.3 □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □

The only other settings are on the OIT500 itself. The default distance from the code plate to the OIT500 face is $350 \text{ mm} \pm 50 \text{ mm}$. If you want the code plate farther away or close then remove the cover and adjust the illumination slide bar. The camera does not need to be adjusted unless the image is out of focus. See manual for details.

Configure RTS-UP-... Ethernet/IP adapter

Load Ethernet/IP firmware

The RTS-UP unit comes with socket server firmware. If you want other firmware for industrial busses like Ethernet/IP, PROFINET, or Modbus/TCP then download this firmware from our web site and send the firmware to the unit using PortVision.

Download and install Portvision

You may have to reboot your PC to see the RTS unit. Click "Scan".

😯 PortVision Plus			_ 🗆 ×
File Folder Device View Tools He	alp	1	
👗 🍣 🥔 🤣	· 👍 🔌 🥭 😣	🛛 🎸 🕹 🚯	
Scan Refresh Config Save	Load Upload Reboot Web Mgr	r Notes Help Abou	: Exit
	enu or toolbar to add device-specific hotes in	n (nis area. 🔼	C. Canada Car
			and the second
			19
		*	
Scan Results [1 of 1 online]	A Device Name Model	IP Address MAC Ad	dress Software Version Stat
	Oevice 21:02:AF UP-1P (5-30V)) 172.18.30.96 00:C0:4	E:21:02:AF EtherNet/IP 4.07 ON-L
	•		Þ
For Help, press F1			Scan Results 1 1 Ready

Scanning for RTS-UP... devices

Download the Ethernet/IP firmware

If the Scan Results do not show a device with Ethernet/IP firmware; then highlight the device and go to the menu "Device > Upload Firmware" and update the RTS unit with the right firmware. When you install the Ethernet/IP firmware above the .bin file will be in the folder Comtrol > Ethernet/IP > Ethernetip-x.xx.bin



Loading the Ethernet/IP firmware into the RTS-UP...

Using PortVision you can also double click on the scanned unit and configure the IP Address, subnet mask, and gateway.

- LOOIS	User Guides		
10013		DeviceMaster UP 1-Port (5-30VDC)	
	Detection Type : LOCAL	Device Name : Device 21:02:AF MAC Address : 00:C0:4E:21:02:AF	
ſ	Applu Changes	Natural Sattinga	
-	Apply changes		
	Undo Changes	O Disable IP	
	Undo Changes Reboot Device	C Disable IP C DHCP IP C Static IP IP Address: 172.18.30.96	
	Undo Changes Reboot Device Save Settings to a File	C Disable IP C DHCP IP G Static IP IP Address : 172 . 18 . 30 . 96 Subnet Mask : 255 . 255 . 0 . 0	
	Undo Changes Reboot Device Save Settings to a File Load Settings from a File	C Disable IP C DHCP IP G Static IP IP Address : 172 . 18 . 30 . 96 Subnet Mask : 255 . 255 . 0 . 0 Default Gateway : 172 . 18 . 0 . 52	
	Undo Changes Undo Changes Reboot Device Save Settings to a File Load Settings from a File Help	C Disable IP C DHCP IP C Static IP IP Address : 172 . 18 . 30 . 96 Subnet Mask : 255 . 255 . 0 . 0 Default Gateway : 172 . 18 . 0 . 52	

IP address configuration screen for RTS-UP...

Configure the RTS and OIT to work together

Put the IP address of the RTS-UP... unit in a web browser. You will configure the rts-up...unit here.



Go to Ethernet Device Configuration and open up socket 1. Make the configuration changes you see below. Some settings you will have to customize yourself.

Things you will need to know to make these settings:

PLC IP address

PLC controller slot number(Usually 0)

Control tag variable, SINT array, where the read data will be placed. My example has a variable called OIT500[30] that is an SINT array.

Always connect juration

Device TCP Connection Configuration Enable:		
Listen:		Enable
Listen Port:	8000	
Connect To Mode:	Connect-Always	Always connect
Connect Port:	10100	young to commerce
Connect IP Address:	172 18 30 168	OIT500 Easymode port
Disconnect Mode:	Never V	Off Sou Easymode port
Idle Timer:	0 (msec)	IP address of OIT500
Socket Packet ID Settings Rx Timeout Between Packets:	100 (ms)	Disconnect Never
STX (Start of Transmission) Rx Detect:	one byte 💌 Byte 1:35 Byte 2: (dec)	One prefex character
ETX (End of Transmission) Rx Detect:	two bytes V Byte 1:13 Byte 2:10 (dec)	# = 35desimal
PLC Specific Settings		# = 55uecimai
STX (Start of Transmission) Tx Append:	none 💌 Byte 1: Byte 2: (dec)	Two Suffix characters
ETX (End of Transmission) Tx Append:	none 💌 Byte 1: Byte 2: (dec)	carriage return = 13dec
Strip Rx STX/ETX:		Line feed = 10dee
Application Specific Settings STX (Start of Transmission) Tx Append:	none 💌 Byte 1: Byte 2: (dec)	Line leed = Todec
ETX (End of Transmission) Tx Append:	none 💌 Byte 1: Byte 2: (dec)	
Strip Rx STX/ETX:		
EtherNet/IP Settings		Writes the OIT500 data
Rx (To PLC) Ethemet Transfer Method:	Write-to-Tag/File	directly to PLC memory
PLC IP Address:	172.18.30.7	
PLC Controller Slot Number (ControlLogix Family):		
Maximum PLC Update Rate (Write-To-Tag/File):	40 (msec)	PLC IP address
Maximum Rx Data Packet Size:	30 (bytes)	
Oversized Rx Packet Handling:	Truncate 💌	
Rx (To PLC) Produced Data Tag/File Name:	017500	Slot the controller is in
Note: File names for SLC/PLC-5 must begin with a "\$" (i.e. \$N10:0) Note: File names for Microl only must begin with a "#" (i.e. #N10:0)		(Not the ethernet card)
Tx Sequence Number Checking:		
Disable Non-Filtered To PLC Rx Queue:		
(PLC-5/SLC) Rx MS Byte First:		Variable Where the
(PLC-5/SLC) Tx MS Byte First:		data will be placed in
Filtering/Data Extraction Configuration To PLC Filter Mode:	0#	Must be type SINT
To PLC Filter Options (RFID Only):	Antonna 🔲 Filter Value 🔤 Serial Number	man or the owned
To PLC Filter Options (RFID/Barcode):	Company Draduct/Location D Encodies/Numberies	
To Application Filter Mode:	Off	
To Application Filter Options (RFID Only):	Antonna 🔲 Eilter Value 📃 Serial Number	
To Application Filter Options (RFID/Barcode):	Company Braduct/Location Encoding/Numbering	
RFID Antenna Grouping:	None	
RFID Reader Interface Type:		
Barcode UPC/EAN Standard 12-14 Digit Format:	None	
Barcode UPC/EAN Eight Digit Format:	None	
Filter Age Time (Time filtered after last read):	0 (min)0 (sec)100 (msec)	
Discard Unrecognized Data (RFID/Barcode):		
Analise Kan TCD Connection Conference Kan	• • • • • • • • • • • • • • • • • • •	

Port configuration screen for RTS-UP...

Once all settings have been made, choose "Submit" at bottom of page. Wait for unit to reboot.

How will you know it is working?

Go back to the web configuration screen of the RTS-UP... unit and now go to the PLC Interface Diagnostics screen. Hardware trigger the OIT500. Refresh screen and the "Messages/Responses Sent to PLC" will count up on the PLC Interface Diagnostics screen. Also at the bottom you will see "No Error Detected"

PLC Interface Diagnostics

Server Configuration Home Serial Device Configuration Ethernet Device Configuration Communication Statistics Display Serial Logs

EtherNet/IP Interface Statistics	Reset Statistics
Messages/Responses Received From PLC:	3
Broadcasts Received From PLC:	0
Messages/Responses Sent To PLC:	3
Request Messages From PLC:	0
Bad Responses to Msgs Sent To PLC:	0
Invalid Network Path Errors:	0
No Response From PLC Errors:	0
Pending Request Limit Errors:	0
Unexpected Event Errors:	0
Unsupported CIP Request Instance Errors:	0
Unsupported CIP Request Service Errors:	0
Unsupported CIP Request Class Errors:	0
Unsupported CIP Request Attribute Errors:	0
Improper Configuration Errors:	0
Invalid Message Data Errors:	0
System Resource Errors:	0
Oversized Received Data Packet Errors:	0
Writes To Offline Ethernet Device on Socket1	:0
First Error Description:	No Error Detected

In the PLC the data will also appear. Make the size of the variable in the PLC 30. Or SINT[30]

...

The amount of data from the OIT500 will always be exactly 14 bytes. There will be a four byte header in the PLC that will be used by your PLC program to figure out when new messages arrive. You program should look for the counter

See below what the tag data will look like in the PLC.

⊡-0IT500	{}	ASCII	SINT[30]	
	12	Decimal	SINT	-
±-0IT500[1]		Decimal	SINT	- Reply counter
±-0IT500[2]	14	Decimal	SINT	
<u> </u> −01T500[3]	0	Decimal	SINT	Received Length
	'#'	ASCII	SINT	incontrou Eorigin
	0'	ASCII	SINT	
	101	ASCI	SINT	
	יסי	ASCII	SINT	
	'0'	ASCII	SINT	Code
	121	ASCI	SINT	
+-OIT500[10]	'2'	ASCII	SINT	
	\$00'	ASCII	SINT	
	'\$00'	ASCI	SINT	
	'\$00'	ASCI	SINT	Status
+-OIT500[14]	ن 00غ	ASCII	SINT	
	(**'	ASCI	SINT	Checksum
+-OIT500[16]	'\$r'	ASCH	SINT	0
	'\$1'	ASCI	SINT	Suffix

Response when code is present

□-0IT500	{}	ASCII	SINT[30]
÷-0IT500[0]	13	Decimal	SINT
÷-0IT500[1]	0	Decimal	SINT
÷-0IT500[2]	14	Decimal	SINT
÷-0IT500[3]	0	Decimal	SINT
÷-0IT500[4]	'#'	ASCII	SINT
÷-0IT500[5]	'N'	ASCII	SINT
÷-0IT500[6]	'0'	ASCII	SINT
±-0IT500[7]	'R'	ASCII	SINT
±-0IT500[8]	'E'	ASCII	SINT
±-0IT500[9]	'A'	ASCII	SINT
+-OIT500[10]	יםי	ASCII	SINT
+-OIT500[11]	'\$OO'	ASCII	SINT
+-OIT500[12]	'\$OO'	ASCII	SINT
÷-0IT500[13]	'\$OO'	ASCII	SINT
±-0IT500[14]	'3'	ASCII	SINT
±-0IT500[15]	'\$O3'	ASCII	SINT
	'\$r'	ASCII	SINT
±-0IT500[17]	'\$1'	ASCII	SINT

Response when no code is there

An Add-on instruction is also available. The instruction takes the 18 character string and breaks the data up into a counter, code, and status. The code is also converted from an ASCII string to a Double integer.



Software Trigger

An alternative to a hardware trigger a command can also be sent from the PLC when a code plate should be read.

		A command #RC <cr><l Class 74, Instance 1,</l </cr>	.F≻ is sent for a software trigger Attribute 1 for Ethernet Port 1	
	soft_trigger_bit		Massaga	-MSG
- [Message Control	OITSoftwareTrigger
		Enable rung whenever a	software trigger is i	required

Message Configuration - OITSoftwareTrigger	X
Configuration Communication Tag	
Message Type: CIP Generic	
Service Set Attribute Single	Source Element: OITCommand[0]
туре.	Source Length: 20 🐳 (Bytes)
Service 10 (Hex) Class: 74 (Hex) Code:	Destination
Instance: 1 Attribute: 1 (Hex)	New Tag
🔘 Enable 🔾 Enable Waiting 🔵 Start	🔘 Done 🛛 Done Length: 0
Error Code: Extended Error Code:	🔲 Timed Out 🗲
Error Path: Error Text:	
OK	Cancel Apply Help

MSG configuration

Message Configuration - OITSoftwareTrigger	X					
Configuration Communication Tag						
Path: ENET, 2, 172.18.30.96 Browse ENET, 2, 172.18.30.96						
Communication Method © CIP DH+ CIP With Source ID Source Link: Destination Node: Image: Cip						
Connected Cache Connections						
● Enable ◯ Enable Waiting ◯ Start ● Done Done Length: 0						
○ Error Code: Extended Error Code: ☐ Timed Out € Error Path: Error Text:						
OK Cancel Apply Help						

Communication configuration

OITCommand	{}	Decimal	SINT[30]
+-OITCommand[0]	1	Decimal	SINT
+-OITCommand[1]	0	Decimal	SINT
+-OITCommand[2]	4	Decimal	SINT
+-OITCommand[3]	0	Decimal	SINT
+-OITCommand[4]	'#'	ASCII	SINT
+-OITCommand[5]	'R'	ASCII	SINT
+-OITCommand[6]	'\$r'	ASCII	SINT
+-OITCommand[7]	'\$1'	ASCII	SINT
+-OITCommand[8]	0	Decimal	SINT
+-OITCommand[9]	0	Decimal	SINT
+-OITCommand[10]	0	Decimal	SINT
+-OITCommand[11]	0	Decimal	SINT
+-OITCommand[12]	0	Decimal	SINT
+-OITCommand[13]	0	Decimal	SINT

Structure of the command

Using the RTS with the OIT500 is very easy. If there are any questions please contact Tim Cicerchi at 330-486-0118