Manual Wireless LAN Module (Lantronix xPico)

for Reinhardt Weather Stations



REINHARDT System- und

Messelectronic GmbH Bergstr. 33, D-86911 Dießen-Obermühlhausen Tel. 0049 - 8196 - 934100 or 7001 E-Mail: <u>wetter@reinhardt-testsystem.de</u> WEB: <u>www.reinhardt-wetterstationen.de</u>

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1 For compliance

1.1 Usage

The wireless LAN module for all Reinhardt MWS weather stations and sensors of the M and 55 series includes a WLAN module from Lantronix (xPico) with antenna for connecting a weather station with simultaneous data retrieval on 2 ports. In addition to the WLAN functionality, these modules have a serial port that can be used for configuration if the WLAN has not yet been set up. The WLAN module with its 2 serial ports enables the integration of a weather station into your network via WLAN at a single IP address via 2 ports (ports 10001 (full access) and 10002 (read only) are preset by default).

With the WLAN outdoor module, a wireless connection to your network can be established in infrastructure mode. With a PC or laptop with an integrated WLAN module, you can establish an ad-hoc connection to the WLAN module. This then corresponds to a cable replacement for the direct connection of the weather station and PC.

When operating with a router, you must integrate the wireless outdoor module into your network. For details, please refer to the instructions for your router and the detailed technical manual for the WLAN module on the weather USB stick. Please note that only one PC can access the IP address of the WLAN module exclusively!

The minimum supply voltage is 6VDC, the maximum supply voltage is 24 VDC ! The current consumption at 18VDC is app. 75 mA.

1.2 Safety instructions



The instruments are manufactured in accordance with modern technical standards and can be operated without danger when used as directed.



Damage caused by non-observance of this operating manual can lead to forfeiture of warranty. REINHARDT System- und Messelectronic GmbH is not liable for subsequent damage.



REINHARDT System- und Messelectronic GmbH is not liable for damage of items or persons caused by improper handling or non-observance of the safety instructions! In such cases any guarantee claims shall become null and void.



Dear customer, the following safety and hazard notices not only protect your health, but also the appliance. Please read the following points carefully.



Do not leave the packaging material lying around. These parts are dangerous toys in the hands of children.

1.3 Mounting

The WLAN module is installed by clamping it to the pipe bracket on a 1 "pipe directly under the weather station.

The connection sockets must point downwards, unused sockets must be closed with the cover caps!

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2 Commissioning

2.1 Hardware Installation

2.11 WLAN-Module in Infrastructure mode

In WLAN mode, the WLAN module is connected to the standard cable (7-pin round plug, possibly with an additional WLAN adapter cable) and supplied with voltage.

The weather station (s) are also connected directly to the WLAN outdoor module (on the middle socket) using a 1:1 cable. The button on the right is used to configure settings via the serial interface The antenna is plugged into the 4th connection (SMA socket) (far left).

If there are problems transmitting data due to too big distance to the router or WLAN-Indoor. Module or due to fences then in most casses an antenna with amplifier or a directional antenna will solve this problem.



<u>Please do not use any tools to fasten the connectors in order to avoid the connectors</u> working themselves loose due to too big force when fastening the connectors!!



For serial operation via CLI (for configuration changes on the module via the COM port), the weather station must be unplugged and the COM port of the pre-assembled power cable connected to the COM port of a PC via a null modem adapter, as well as the Coding plug must be plugged into the right connection of the module!



2.12 WLAN Module in Ad-Hoc-Mode (direct cable replacement)

If integration into a network is not desired or is not possible, a WLAN module can be operated directly with a laptop via WLAN as a cable replacement in ad-hoc mode. The WLAN module is located on the weather station and is supplied with power via the standard cable. Parallel to the WLAN, the data can be read in on another PC via a serial interface.



2.13 Direct connection to a Laptop (Ad-Hoc connection)

In WIN10, an ad hoc connection with a WLAN module can no longer be set up in the network settings.

The following shows how you can still create an ad hoc connection with WIN10

<u>A hotspot must be set up under Windows 10:</u>

- Start command prompt as administrator:

(WIN + R, then type cmd, then press CTRL & SHIFT + ENTER simultaneously)

- Enter in the command prompt:

netsh wlan show drivers

If the listing shows:

"Supports hosted networks: yes"

then the laptop has a suitable WLAN module installed, if "no",

then procure a suitable WLAN adapter (e.g. FRITZ! WLAN Stick AC860)

- Start displaying network connections:

ncpa.cpl

- Create a new network:

netsh wlan set hostednetwork mode = allow ssid = NAME key = PASSWORD

 $(PASSWORD\ must\ be\ at\ least\ 8\ characters\ long)$

- Start new network (hotspot):

netsh wlan start hostednetwork

- Deactivate new network (hotspot):

netsh wlan stop hostednetwork

Proceed as follows to integrate the WLAN module:

- Determine the laptop's IP address on the laptop with *ipconfig* (e.g. 192.168.137.1)

- Set the WLAN module to a suitable IP address in the network (e.g. 192.168.137.100)
- Encryption is WPA2 / TKIP

- Alternatively, adapt the properties of the new network to the WLAN module in the network connections of the laptop.

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email: <u>wetter@reinha</u>	rdt-testsystem.de Web: www.reinhardt-wetterstationen.de

2.2 Security

The WLAN module features WPA, WPS2 and setting with no security is also possible.

Encryption: CCMP, TKIP

<u>CAUTION!</u> <u>EAP-TLS, EAP-TTLS, PEAP and LEAP</u> are not supported at all!

When the customer hasn't ordered with explicit settings the WLAN module is delivered with following settings: SSID: WETTER Topology: Infrastructure Security: none BOOTP, DHCP und AutoIP: enabled

2.3 Software Installation

The installation and commissioning of the weather 32 software is described in the software manual enclosed on the CD.

 $Operation \ with \ a \ WLAN \ router \ requires \ the \ input \ of \ the \ WLAN \ outdoor \ module's \ IP-address \ and \ port(s) \ (port \ 10001 \ for \ channel1 \ (full \ access) \ and \ 10002 \ for \ channel2 \ (only \ read) \ by \ default) \ instead.$

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3 Technical appendix

3.1 Settings of the WLAN module

3.1.1 WEB interface

In order to access the WEB interface, the wireless outdoor module must of course already be "known" to your router. To do this, the IP address, SUB network mask, SSID and the security settings must be correctly entered in the WLAN module to match the settings of your router.

The preset ports of the WLAN module are 10001 and 10002.

If you did not specify a desired IP address when ordering, the default IP address is "192.168.240.93/24", the SSID is "WEATHER" and Security is "none". (see XML file: xPico_set_ # 192_168_240_93. txt on stick)

This IP address takes you to the WEB interface of the WLAN option, in which you can make all further settings.

Further information can be found in the two manuals for the xPico WLAN module (xPico-Wi-Fi UG.pdf and xPico IG.pdf).

To access the xPico's WEB interface, enter the IP address of the WLAN module in a browser, in our case: 192.168.240.93.

the defau	ilt password is	S: PASSW	ORD.	Passwort:	OK Abbrechen	
After clic	king OK the V	VEB inter	rface opens:			
	~Wi_Fi	¢		LAN	NTRONIX.	
Status	Product Information					
AES Crodontiale	Product Type:	xPicoWifi				
Bridge	Firmware Version:	1.4.0.0R28				
CPM	Build Date:	Oct 22 2015	(18:55:25)			
Clock	Serial Number:	0080A3A00E)A6			
Device	Uptime:	0 days 00:57	(:11			
Diagnostics	Permanent Config:	saved				
Discovery	MAC Address:	00-80-43-40	-00-46			
File System	Interface and	00.00.A3.A0	.00.40			
нттр	State:	Up				
Line	SSID:	XpicoWiFi A	00DA6			
Modern Emulation	Security Suite:	WPA2				
Monitor	IP Address:	192.168.0.1/	24			
NIP	Interface wlan0					
Dower	Connection State:	Connected				
Radio	Active WLAN Profile:	1				
SPI	IP Address:	192.168.240	.93/24			
Tunnel	Default Gateway:	<none></none>				
Users	Brimany DNS:	<nana></nana>				
WLAN Profiles	Secondary DNS:	<none></none>				
	Line Settings					
	Line 1:	115200, Non	e, 8, 1, None			
	Line 2:	115200, Non Tunnel	e, 8, 1, None			
	Tunneling	Accept Mode	Connect Mode			
	Tunnel 1:	1 Active	Disabled			
	Tunnel 2:	Waiting	Disabled			
	Convright © I	antronix Inc. 2007-2	015 All rights reserved			
	oopyngin e <u>e</u>	<u>anuonix, me.</u> 2007 2	oro. / al lights reserved.			
Horo vou	on norform	all degiro	deattings			
Tiere you		all desired	a settings.			

3.1.1.1 Setting a new IP-address

Select in WEB-Interface NETWORK --> WLAN0 --> CONFIGURATION

xPic	o Wi-∣		LANTRONIX
QuickConnect Status		ap0 wlan0	[Logout] These settings pertain to the Network Interface on the device.
AES Credentials Bridge		Interface Link	To see the effect of these selections after a reboot, view the corresponding Status. Changes
CLI Server CPM		Status Configuration	Will take effect after reboot or wake from sleep or standby. When ap0 is enabled, DHCP
Clock Device	Interface wland	0 Configuration	Server will assign IP addresses to ap0's clients. DHCP Server manages up to 4 simultaneous
Diagnostics	State:	● Enabled ○ Disabled	clients. (Uniy 3 if Wianu is enabled.)
Discovery	DHCP Client:	O Enabled O Disabled	1
File System	IP Address:	192.168.240.206/24	1
Line	Default Gateway:	<none></none>	
Modem Emulation	Hostname:		
Monitor	Primary DNS:	<none></none>	1
NTP	Secondary DNS:	<none></none>	
Network Dower	MSS:	1460 bytes	
Radio		Cubarth	-
SPI		Submit	
Tunnel			
User			
WLAN Profiles			
	Copyrig	ht © <u>Lantronix, Inc.</u> 2007-2018. All rights reserved.	

After you have entered the desired IP address, click on Submit to apply the settings!

CAUTION:

If you set a different network mask, i.e. change the existing IP address 192.168.240.206/24, e.g. to 192.168.0.100/24, you can only reach the WEB interface in the new network (192.168.0.x) !!

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3.1.1.2 Setting SSID and Secutity

To change the SSID (Network Name) and the encryption (Security), select WLAN Profiles and then the profile to be changed (in most cases profile #1).

×Pico [®] Wi-Fi [®]		LANTRONIX
QuickConnect WLAN Profile Management		[Logout] This page allows view, edit, delete
AES Credentials View or Edit	Delete	or creation of a WLAN Profile on the device.
Bridge CLI Server		Select a profile for editing by clicking its name; this takes you to the Configuration web page.
СРМ		The 🛜 icon indicates the active
Create new WLAN Profile		Delete one or more profiles by
Device		Create a new profile by entering a
Diagnostics		name in the text box. The new profile initially has default parameter values. Up to 4 profiles may be
File System		created.
HTTP Server Line		When you name a new profile or check a box, the Apply and Submit buttons will appear.
Modern Emulation		Use the Apply button to try out the
Monitor		Flash. If the settings do not work,
NTP		still have the original settings.
Network		Use the Submit button to update
Power		are promes and sure ment to ridan.
Radio		
SPI		
Tunnel		
User WI AN Profiles		
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After you set the SSID and the security settings, you can try out the settings by clicking on Apply without saving them.

If your settings work, click Submit to permanently save the new settings!

xPic	o⁺Wi-F	ec 	
QuickConnect Status ㎡	WLAN Profile 1	Configuration	[Logout] Use the Apply button to try out settings on the WLAN without
AES Credentials		Basic	saving them to Flash. If the settings
Bridge	Network Name:	WETTER	device, it will still have the original
CLI Server	State:	Enabled Disabled	settings.
CPM		Security	the WLAN settings and save them
Clock	Suite:	WPA2 V	Use the Test Connection button
Device	WPAx Key Type:	Passphrase	to test connecting to the network
Diagnostics			
Discovery	WPAx Passphrase:	••••••	Profile on the device.
HTTD Sopror	WPAx Encryption:		If wian0 connects to an access
Lino		Advanced	channel, a current connection to
Modem Emulation	TX Power Maximum:	17 dBm	ap0 may be dropped due to the channel change. Reconnect to ap0
Monitor	Power Management:	O Enabled Disabled	in order to continue access to the device
NTP		Apply Submit	
Network		rippy Subme	
Power			
Radio			
SPI			
Tunnel			
User			
WLAN Profiles			
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3.1.2 Basic settings of the WLAN module via serial port (CLI)

If you do not have access to the WEB interface, you can perform the basic settings such as IP address, network name (SSID) and settings of the serial interface parameters using the standard RS-232 cable with null modem adapter on a serial port of the PC.

To perform this, start a terminal program (TeraTerm, Putty, Hyperterminal, etc.) with 9600 baud, 8 bit, no parity, 1 stop bit and no protocol.

TCP/IP	Server:	192.168.240.206	~
		☑ Verlauf	
	Dienst	O Telnet TCP-Port 22	
		SSH Protokoll-Version SSH2	
		O Anderer	~
Sorioll	Port	COM3: PCI Express UART Port (COM	13) ~

Now connect the serial cable to the power / data input (left socket) of the WLAN module, the 9-pin D-SUB plug to a serial port of the PC <u>- with null modem adaptor (V3.1)</u>

- without null modem adaptor (since V3.2) and finally the power supply unit of the serial cable to the 230V mains voltage.

Now press the CONFIG button on the WLAN module and then, within the next 3 seconds, press the x button in the terminal program until you receive a message from the WLAN module in the terminal program (up to 10 seconds).

Then immediately press the Enter key. You are now in the serial interface (CLI) of the WLAN module.



By entering a "?" you will receive a list of the possible commands at each command level. With the following commands you can now set the most important parameters to access the module via WLAN and thus also to be able to reach the more comfortable WEB interface:

🔟 COM3 - Tera Term VT	5		×	
D <u>a</u> tei B <u>e</u> arbeiten Ein <u>s</u> tellungen	Ste <u>u</u> erung <u>F</u> enster <u>H</u> il	lfe		
xPicoHifi 00:80:A3:A0:19:34			^	
Press <enter> to continue></enter>			N	
Connand Line started.				
>? config	file system			
help tlog	status ulan scan [netuork-name]			
xnl	exit			
> <mark>conf</mark> ig				
config>?				
exit µrite	ulan apply Access Point			
Clock HTTP Server	CPM Interface <instance></instance>			
Line <instance> SPI</instance>	Роµer Users			
HLAN Profile <instance> Discoveru</instance>	AES Credential (instance)			
Monitor Tunnol (instanco)	NTP Suston (instance)			
Tunner (Instance/	custon (instance)			
cont 192				
			~	
config WLAN profile 1 Basic				
	letwork name NETW	ORK-N	AME	
exit Securi	21			
Securit	y Suite WPA2			
	WPAx			
	key Dave	type pa	ssphrase	
	Pas enc	sspnrase rvntion	PASSWORD TKIP	
	wri	te		
	exit			
enit	xit			
Interface WLAN0				
, IP add	ress 192.168.240.93/2	24		
DHCP	client disable			
write				
CWII				
After the EXIT command, wi at least 10 seconds to restar	th which you left the the module, or brief	CLI moo ly pull o	lule, now press the ut the power plug a	CONFIG button for nd plug it in again
A description of all command <u>xPico-Wi-Fi_UG.pdf</u> , under '	s which can be sent v Using CLI".	ia the se	rial port you'll find	on the USB-stick ir

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3.1.3 Configuration with a text file

A more convenient configuration option is to transfer a text file to the WLAN module using a terminal program.

On the *WetterStick* you will find some ready-made configuration files in the folder named *!_WLAN-Modul_config*, which you can adapt to your specifications. Once you have completed a configuration file, proceed as follows:



If the file has been transferred correctly, the following completion message appears: *XML import completed*

ATTENTION: The transfer and the following processing take approx. 2 minutes! Do not abort the process under any circumstances before the completion message appears!



In order to check whether the desired IP address has been entered in the WLAN module, enter the following commands one after the other, each followed by the ENTER key:

config interface wlan0 show

The list of the settings for the wireless interface WLAN0 appears:



You can list other possible commands with an ?

<u></u> C	OM2 - Tera Te	erm VT		_		×
D <u>a</u> tei	B <u>e</u> arbeiten	Ein <u>s</u> tellungen	Ste <u>u</u> erung	<u>F</u> enster	<u>H</u> ilfe	
interfac	te HLANO					^
config 1 Interfac DHCP C IP Ado Defau Hostna Prima Second HSS	Interface ulanD ce ulanD Config i Ena Client : Dis Jress : 192 It Gateuay: <no ane : ry DNS : <no dary DNS : <no i 146</no </no </no 	>shou uration: bled abled .168.240.205/24 ne> ne> ne> 0 bytes				
config 1 shou exit DHCP Cli Default Primary HSS <val config 1</val 	Interface µlanD ient <value> Gateµay <value DNS <value> lue> Interface µlanD</value></value </value>	>	urite State (value) IP Address (Hostnane (va Secondary DN)	> value> lue> S <value></value>		~
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You leave the active level with the command *exit*

💆 COM2 - Tera T	ferm VT		_		×
D <u>a</u> tei B <u>e</u> arbeiten	Ein <u>s</u> tellungen	Ste <u>u</u> erung	<u>F</u> enster	<u>H</u> ilfe	
State : Er DHCP Client : Di IP Address : 19 Default Gateway: < Hostname : Primary DNS : < Secondary DNS : < MSS : 1 ² config Interface wlar show exit DHCP Client <value> DFAULT Gateway <value> Primary DNS <value> HSS <value> config Interface wlar config Interface wlar</value></value></value></value>	abled sabled 2.168.240.205/24 lone> lone> l60 bytes l0>? le>	urite State «value) IP Address «v Hostname «va Secondary DNS	> value> lue> S <value></value>		^
>					~

If everything is OK, press the CONFIG button for at least 10 seconds to restart the WLAN module, or pull out the power plug for more than 10 seconds and then plug it in again.

The settings are now permanently saved.

For more information on the xPico WLAN module, read the documentation on the xPico-Wifi from Lantronix. You can find this on the WetterStick or on the Lantronix Homepage.

3.1.4 LEDs and jumpers since V3.2





3.22 Connection cable weather station RS-422 for MWS55, 88, 10 (1:1)

1:1 Kabel RS422 - 1:1 Cable RS422 (MWS55 / MWS88 / MWS10 / Sens_55 (Stand 27.07.2018) (alle Ansichten auf die Frontesite - all views onto front side)

(alle Ansichten auf die Frontseite - all views onto front side) MWS 55, 88, 10: 1,2: GND (gr) WLAN-Modul, ...: 3: R+ MWS (ge) 1,2: GND (gr) 3: R+ MWS (ge) 4: T- MWS (ws) 4: T+ MWS (br) 5: VCC (rs) 6: R- MWS (gn) 5: VCC (rs) 7: T+ MWS (br) 6: R- MWS (gn) MWS - R+ (ae) - (vellow) 7: T- MWS (ws) GND MWS - (gr) - (grey) Stromversorgung, 2 adrig, max 100m Powerline , 2 wires, max 100m C (cMWS - T+ (br) - (brown) VCC MWS - (rs) - (pink) MWS - R- (an) - (areen) MWS - T- (ws) - (white)

> RS422 1:1 Kabel , 6 adrig, max 1000m RS422 1:1 cable , 6 wires, max 1000m

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