

uFR Online – Quick Start Guide Version 3.6



Table of contents

Ins	talling uFR Online Reader	5
	Step 1: Power on a device	5
	Step 2: Connect to the uFR Online	5
	Step 3: Set up your device	5
	Step 4: Finish setting up your device	5
uFF	R Online Reader settings	6
	Open WiFi network settings dashboard	6
	Open advanced settings dashboard	6
	uFR Online Test	7
	Access Point settings	8
	UDP/TCP ports and protocols settings	8
	UART settings	9
	Transparent mode settings	10
	Login credentials settings	10
	Master/Slave mode settings	10
	BT Serial mode settings – available in versions 2.0+	11
	BLE HID mode settings – available in versions 2.0+	11
	BLE HID mode reverse UID settings – available in versions 2.0+	12
	BLE mode settings – available in versions 2.0+	12
	BLE mode characteristic settings— available in versions 2.0+	13
	BLE mode security settings— available in versions 2.4.7+	13
	BLE TX power settings— available in versions 2.5.8+	14
	BLE/Network combine mode- available in versions 2.5.9+	14
	Host address settings	15
	Using Basic HTTP authentication: http://username:password@example.com/	15
	From firmware version 2.6.1+ there is an option available for a second server. For more details read	4 -
	section Master mode flow diagram	15
	Master mode settings	16
	Linear read settings	17
	DESFIRE UID settings	18
	Additional POST parameters	19
	Lard UID format	19

2



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Mobile AID settings	20
HTTP command test	21
UDP broadcast IP settings	21
UDP broadcast format settings	23
UDP broadcast retry settings	24
Install uFR firmware	24
Modem sleep settings	25
Static IP address settings	26
Basic information	26
uFR Reader Async UID send mode	27
Cloud IoT settings	27
Network timeout on boot settings	28
Log mode settings	29
LED brightness control	31
AP mode NFC Tag polling settings	31
uFR Online LED status table	32
uFR Online default settings table	33
uFR Online REST services	34
uFR Online Reader basic usage	37
UDP/TCP communication	37
UDP/TCP communication – Reader opening example	37
BT serial mode communication	37
BT serial mode communication – Reader opening example	37
BT serial mode communication	38
Transparent mode communication – Reader opening example	38
HTTP mode communication	38
HTTP mode communication – GetCardIdEx example	38
uFR Online Reader protocols structure	39
Master mode POST request	39
Master mode POST response	40
Master mode UDP broadcast	41
UDP discovery server	41
Master mode flow diagram	42
uFR Online only COM protocol commands	43
uFR Online Reader tools	64

3



uFR Online flasher oneclick – Update tool uFR Online finder – Network discovery tool	
uFR Online OEM lock/unlock uFR NFC Browser Extension – Useful links	

Revision history



Installing uFR Online Reader

Follow the instructions below to install your uFR Online reader.

Step 1: Power on a device

- 1. Connect the device to a power source.
- 2. Wait for a few moments to device boot in Access Point mode (see LED status table below).
- 3. Device will blink until client is not connected.

Step 2: Connect to the uFR Online

- 1. Scan for networks using your WiFi enabled device (computer, smartphone etc.).
- 2. Connect to a device named ONxxxxxx.
- 3. Wait for the connection to be made successfully.
- 4. Open your favorite web browser and navigate to http://192.168.4.1

Step 3: Set up your device

- 1. After the web page is loaded successfully log in using default credentials (see table 1 below).
- 2. Wait for a few moments to scan the device for available WiFi networks.
- 3. Select a WiFi network and click the connect button.
- 4. Enter password for wireless network if needed and wait to connect successfully.

Step 4: Finish setting up your device

- 1. Click on uFR Online button on the top left corner to find out your new IP address.
- 2. Reboot your uFR Online reader.



uFR Online Reader settings

Follow the instructions below to change uFR Online reader settings.

Open WiFi network settings dashboard

- 1. Open your favorite web browser and navigate to http://<device-ip-address>.
- 2. Log in using default credentials (see table 1 below).
- 3. After the web page is loaded successfully, WiFi settings dashboard will be shown.
- 4. If the reader is working in BLE, BT or HID mode, WiFi station mode is not available (Only AP).

uFR Nano configurator All changes will not take affect until device restart.	Other se	ttings Restart	Check for update
CONNECTED TO:			
CH 1 -78 dBm			
AVAILABLE NETWORKS (1): ひ			
CH 1			

Open advanced settings dashboard

- 1. Follow the instructions above (WiFi network setting section).
- 2. Click on the Other settings button.
- 3. Advanced settings dashboard will be shown on screen.

uFR Nano configurator All changes will not take affect until device rest	nt.	WiFi settings	Restart	Check for update
	Access point SSID: UN101502 Password: Edit			
	UDP ports - Click to switch to TCP			



uFR Online Test

- 1. Open advanced settings dashboard.
- 2. Navigate to the Open µFR Online test section and click.
- 3. Use color wheels to change LED colors.
- 4. Click on the Beep button to send a sound signal.
- 5. Approach an NFC card or tag to read UID.

#fff00		#ff004d
	Веер	



Access Point settings

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button in section Access point.
- 3. Change fields SSID and Password.
- 4. Click on the button Save.

Access point SSID: UN101302 Password: Edit		
ssiD: UN101302 Password: Edit	Acces	ss point
Edit	SSID: Passwo	UN101302
		Edit

UDP/TCP ports and protocols settings

- 1. Open advanced settings dashboard.
- 2. Click on Edit button in section UDP/TCP ports..
- 3. Change fields Port 1 and Port 2.
- 4. Click on the button Save.
- 5. <u>Click on UDP/TCP ports header text to toggle between these two protocols.</u>



UART settings

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button in the section UART Baud rates.
- 3. Change fields UART 1 and UART 2.
- 4. Click on the button Save.
- 5. Click on UART1 or UART2 RS485 disabled/enabled to toggle RS485 support on the serial port.
- 6. Click on UART2 force mode disabled/enabled to togle UART2 force mode. When force mode is

enabled, UART2 is always on and devices that is not from uFR series can be connected.

	UART Baud rates	
L	JART 1:	
	115200	
U	JART 2:	
	115200	
	Edit	
	UART1 RS485 disabled - Click to enable	
	UART2 RS485 disabled - Click to enable	
	UART2 force mode disabled - Click to enable	





- 1. Open advanced settings dashboard.
- 2. Click on the Edit button in section Transparent mode.
- 3. Change field Reader to toggle between first and second serial ports.
- 4. Click on the button Save.
- 5. Click on Transparent disabled/enabled text to toggle transparent mode.

Reader: 1 Edit	
Edit	

Login credentials settings

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button in the Login section.
- 3. Change fields Username and Password.
- 4. Click on the button Save.

Username: Uffr Password: ••• Edt		
Username: ufr Password: ** Edit	Login	
Edit	Username: ufr Password: •••	
	Edit	

Master/Slave mode settings

- 1. Open advanced settings dashboard.
- 2. Click on text Working in Master/Slave mode to toggle between these two modes.

Working in slave mode - Click to switch to master mode	
Working in slave mode - Click to switch to master mode	



BT Serial mode settings – available in versions 2.0+

- 1. Open advanced settings dashboard.
- 2. Click on text BT serial mode enabled/disabled to toggle BT serial mode.
- 3. This setting is only available in slave mode only if BLE mode is disabled.

BT mode disabled - Click to enable

BLE HID mode settings - available in versions 2.0+

- 1. Open advanced settings dashboard.
- 2. Click on text BT mode enabled/disabled to toggle HID mode.
- 3. <u>This setting is only available in master mode.</u>

BT mode disabled - Click to enable



BLE HID mode reverse UID settings - available in versions 2.0+

- 1. Open advanced settings dashboard.
- 2. Click on text BLE HID mode UID /not/ reversed to change settings.

BLE HID mode UID not reversed

BLE mode settings – available in versions 2.0+

- 1. Open advanced settings dashboard.
- 2. Click on text BLE mode enabled/disabled to toggle BLE mode.
- 3. <u>This setting is only available in slave mode and only if BT Serial mode is disabled.</u>

BLE mode disabled - Click to enable



BLE mode characteristic settings- available in versions 2.0+

- 1. Open advanced settings dashboard.
- 2. Click on text BLE mode using read/notify characteristic to toggle BLE receiving data mode.
- 3. This setting is only available in slave mode and only if BT Serial mode is disabled.

BLE mode using read characteristic

BLE mode security settings- available in versions 2.4.7+

- 1. Open advanced settings dashboard.
- 2. Click on text BLE security enabled/disabled to toggle BLE enable or disable security protocols.
- 3. If security protocols are enabled you can enter 6-digit PIN or enter O(zero) to disable PIN

authorization.

4. <u>This setting is only available if BLE mode is disabled.</u>

BLE security enabled - Click to disable
6-digit PIN (Enter 0 (zero) to disable PIN): 123456
Edit



BLE TX power settings- available in versions 2.5.8+

- 1. Open advanced settings dashboard.
- 2. Click on text BLE security enabled/disabled to toggle BLE enable or disable security protocols.

3. Set TX power from 0 to 7. Default is 7, that is the highest available TX power. To reduce the BLE range, set a lower value.

BLE TX Power
BLE TX Power (0-7):
7
Edit

BLE/Network combine mode- available in versions 2.5.9+

- 1. Open advanced settings dashboard.
- 2. Navigate to BLE/Network combine mode section.
- 3. Select "Enable BLE slave in current mode" to enable BLE slave mode in combination with current mode (eg. Master mode, UDP/TCP slave mode).

If this mode is enabled alongside Master you can send data from BLE to HTTP server using the following command: HTTP:<DATA TO SEND>. For example, HTTP:TEST where TEST will be passed to the server. For more information read "uFR Online BLE to HTTP POST" document.

BLE/Network combine mode - Experimental! Mode: Enable BLE slave in current mode			
Mode: Enable BLE slave in current mode		BLE/Network combine mode - Experimental!	
Enable BLE slave in current mode	1	Mode:	
Save		Enable BLE slave in current mode	~
		Save	



Host address settings

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button in the Host section.
- 3. Change field Host.
- 4. Click on the button Save.
- 5. <u>This setting is only available in master mode.</u>

Server host URL	
URL:	
Edit	

Using Basic HTTP authentication: <u>http://username:password@example.com/</u>

From firmware version 2.6.1+ there is an option available for a second server. For more details read section <u>Master mode flow diagram</u>



Master mode settings

- 1. Open advanced settings dashboard.
- 2. Switch to master mode.
- 3. Click on the option that you want to enable or disable.
- 4. <u>This setting is only available in master mode.</u>



In Cardholder mode POST requests are sent when a card is placed on the reader and the card is removed from the reader.



Linear read settings

- 1. Open advanced settings dashboard.
- 2. Switch to master mode.
- 3. Enable Linear read.
- 4. Click on the Edit button and change linear read settings.
- 5. Click on the button Save.
- 6. <u>This setting is only available in master mode.</u>

Linear read	settings	
Mode:	LINEAR_READ_AKM1	T
Address:	0	
Size:	10	
Auth mode:	PK_AUTH1A	T
		Edit



DESFire UID settings

- 1. Open advanced settings dashboard.
- 2. Switch to master mode.
- 3. Enable DESFire UID.
- 4. Click on Edit button and change DESFire UID settings.
- 5. Click on the button Save.
- 6. <u>This setting is only available in master mode.</u>

DESFire UID settings
Mode:
Key:
00000000000000000000000000000000000000
000000
Aid key number:
Edit



Additional POST parameters

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button in the Additional POST parameters.
- 3. Change field Parameters.
- 4. Click on the button Save.
- 5. <u>This setting is only available in master mode.</u>

Additional POST parameters	
Parameters (eg. key1=value1&key2=value2):	
Edit	

From firmware version 2.6.1+ there is an option available for a second server. For more details read section <u>Master mode flow diagram</u>

Card UID format

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button in the Card UID format.
- 3. Select UID format (Hexadecimal, Inverted hexadecimal, Decimal, Inverted decimal).
- 4. Click on the button Save.
- 5. <u>This setting is only available in master mode and will change the UID format in HTTP post.</u>

Additional POST parameters	
Parameters (eg. key1=value1&key2=value2):	
Edit	



Mobile AID settings

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button and change mobile AID.
- 3. Click on the button Save.
- 4. <u>This setting is only available in master mode.</u>

	Mobile AID	
AID:		
F00102030	405	
	Edit	

For more details about Mobile AID navigate to:

https://www.d-logic.net/code/nfc-rfid-reader-sdk/ufr-examples-android-host_card_emulation



HTTP command test

- 1. Open advanced settings dashboard.
- 2. Write HEX string in field Command.
- 3. Click on the button Sent to UART1/UART2.

Command: 5526AA000101E0 Send to UART1 Send to UART2	HTTP comma	nd test	
Send to UART1 Send to UART2	Command:	5526AA000101E0	
Send to UART2		Send to UART1	
		Send to UART2	

For more informations about COM protocol visit:

https://www.d-logic.net/code/nfc-rfid-reader-sdk/ufr-doc/raw/master/uFR_COM_Protocol.pdf

UDP broadcast IP settings

- 1. Open advanced settings dashboard.
- 2. Click on Edit button and change UDP broadcast IP address and port.
- 3. Click on the button Save.
- 4. <u>This setting is only available in master mode.</u>

From version 2.6.8 there is option to send UDP bradcast using IP address in card. For more information, read the "uFR Online UDP broadcast using card data" document.

 UDP broadcast IP address	
IP address:	
192.168.1.255	
 Port:	
8881	
Edit	



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22



UDP broadcast format settings

- 1. Open advanced settings dashboard.
- 2. Navigate to UDP broadcast and edit parameters.
- 3. Click on the button Save.
- 4. <u>This setting is only available in master mode.</u>

UDP br	oadcast format	
80/		
Serial number (UNxxxxx)		~
1		
UID		~
/0		
Add predefined parameter	Add custom parameter	
Set Dat	e/Time format	
Set U	ID delimiter	
	Save	
	Clear	



UDP broadcast retry settings

- 1. Open advanced settings dashboard.
- 2. Click on the Edit button and change the number of retries (max. 255) and interval (max. 10000).
- 3. Click on the button Save.
- 4. <u>This setting is only available in master mode.</u>

UDP broadcast retry
Number of Retries: 200 Retry interval (msec): 1
Edit

Install uFR firmware

- 1. Open advanced settings dashboard.
- 2. Navigate to install the uFR firmware section.
- 3. Select port and click Get available firmwares button.
- 4. Click on the firmware version to install and wait for a confirmation message.

Install uFR fir	mware		
Port:	1		
		Get available firmwares	



RTC settings

- 1. Open advanced settings dashboard.
- 2. Navigate to the RTC settings section.
- 3. Click on Get UTC date/time button to get current RTC UTC date/time.
- 4. Click on Set current UTC system date/time button to set RTC UTC date/time from system.

UTC Date/time: 01/01/2000 07:52:29 AM Get UTC date/time Set current UTC system date/time			
UTC Date/time: 01/01/2000 07:52:29 AM Get UTC date/time Set current UTC system date/time	RTC settings		
Get UTC date/time Set current UTC system date/time	UTC Date/time:	01/01/2000 07:52:29 AM	
Set current UTC system date/time		Get UTC date/time	•
		Set currer UTC syste date/time	it m

Modem sleep settings

- 1. Open advanced settings dashboard.
- 2. Navigate to the Modem sleep section.
- 3. Click on text Modem sleep enabled/disabled to toggle.
- 3. <u>Modem sleep can reduce performance, but also reduces heating significantly.</u>

Modem sleep enabled - Click to disable



Static IP address settings

- 1. Open advanced settings dashboard.
- 2. Navigate to the static IP section.
- 3. Click on text Static IP enabled/disabled to toggle.
- 4. Click on the Edit button and change ip settings.
- 5. Click on the button Save.
- 6. <u>Note: If you set wrong parameters, use uFR Online flasher to factory reset.</u>

Static IP enabled - Click to disable	
IP address:	
Subnet mask: 255.255.255.0	
Default gateway: 192.168.1.10	
DNS server:	
Edit	

Basic information

- 1. Click on uFR Online button on the top left corner.
- 2. Basic information about the device will pop up on screen.

HTTP comman	d test				
Command:					
		Info		×	
		Firmware version:253 Device serial number:0 Mode: wireles IP address: 192.16 Readers serial numbers:	5.255.0E ON101 ss 58.1.86 : UN101		
Install uFR firm		Ok			
Port:	1				



uFR Reader Async UID send mode

- 1. Open advanced settings dashboard.
- 2. Click on Send async enable command to UART1/2 to enable Async UID mode.
- 3. Click on Send async disable command to UART1/2 to disable Async UID mode.

uFR Reader Async UID send mode
Send async enable command to UART1
Send async disable command to UART1
Send async enable command to UART2
Send async disable command to UART2

Cloud IoT settings

- 1. Open advanced settings dashboard.
- 2. Switch to master mode.
- 3. Enable Cloud IoT support.
- 4. Select Cloud IoT service from list and enter required data.
- 5. Click on the button Save and overwrite. **All settings are read only.**
- 6. <u>This setting is only available in master mode.</u>

Service: Microsoft Azure Connection string: Save and overwrite	Cloud IoT settings (Cannot be	read, only overwrite)
	Service: Microsoft Azure Connection string: Save and overw	νīte





- 1. Open advanced settings dashboard.
- 2. Click on the edit button and change timeout intervals..
- 3. Click on the save button.

Waiting for network timeout determines how long the device will wait for the network before turning AP mode on.

AP mode timeout determines how long the device will be in AP mode before trying again to connect. (min. 5s)

Network timeout on boot settings	
Waiting for network timeout (seconds):	
30	
AP mode timeout (seconds):	
120	
Edit	



Log mode settings

- 1. Open advanced settings dashboard.
- 2. Switch to master mode.
- 3. Enable RTC POST in master mode section settings. Important!
- 4. Enable Log mode support.
- 5. Navigate to the Log mode setting and click on the Edit button.
- 6. Enter NTP server host, NTP sync interval (in hours), Log server host (URL where to send log), log sending time (when to automatically send log).
- 7. Click on the button Save.
- 8. <u>This setting is only available in master mode.</u>

Log mode settings		
NTP server host:		
NTP sync interval:		
Las constructor		
Log server nost:		
Log sending time:		
Type 1 cards:		
000000		L
Type 2 cards:	_	_
000000		L
Type 3 cards:	_	
00000		L
Type 4 cards:		
Type 5 cards:	-	
00000		L
Type 6 cards:	-	0
000000		L
Type 7 cards:	_	_
000000		L
Edit		
Show log		
Send log		

Using Basic HTTP authentication: http://username:password@example.com/

29



	Log fo	ormat		
Date and time	Date and time Card UID 1 Card type			
	Exai	nple		
2021-12-30 10:51	AABBCCDD	1	0	
	Parameters are se	parated by comma		

Card types parameters are optional. There are two options for each card type. First is color in (RGB HEX format) and second is list of card UIDs (Click on L button).



LED brightness control

- 1. Open advanced settings dashboard.
- 2. Click on the edit button and change brightness to a value between 0 and 100.
- 3. Click on the save button.

LED brightness control is global and applies to all modes.

Brightness (0-100): 100
Edit

AP mode NFC Tag polling settings

- 1. Open advanced settings dashboard.
- 2. Click on the edit button and change timeout. To disable polling enter **-1**.
- 3. Click on the save button.

AP mode NFC Tag polling timeout is the time between reading NFC Tag that contains WiFi or BT/BLE connecting parameters and getting commands from transparent mode over USB.

Timeout in seconds (set value to -1 to disable polling) : 10 Edit	AP mode NFC Tag polling
Edit	Timeout in seconds (set value to -1 to disable polling) :
	Edit



uFR Online LED status table

In the table below are described all LED states of uFR Online.

LED status color	Description
Steady white Steady white	Device is booted. Waiting for connection.
Steady blue Steady blue	Device is booted in BT serial mode.
Steady cyan Steady yellow	Device connected to WiFi in Slave mode.
Steady cyan Steady cyan	Device connected to LAN in Slave mode.
Steady blue Steady magenta	Device connected to WiFi in Master mode.
Steady magenta Steady magenta	Device connected to LAN in Master mode.
Blinking cyan Blinking yellow	Device is visible as AP in Slave mode.
Blinking blue Blinking magenta	Device is visible as AP in Master mode.
Steady blue Steady blue	Device is booted in BT serial mode.
Steady orange Steady orange	Device is booted in HID mode.
Steady light blue Steady light blue	Device booted in BLE mode.
Steady red Steady red	Device is booted in uFR Nano flashing mode.
Steady green Steady green	Device is updating firmware OTA.



uFR Online default settings table

In the table below are shown default settings for uFR Online.

Parameter	Value
Access point IP address	192.168.4.1
Server protocol	UDP
Port 1	8881
Port 2	8882
UART1 baud rate	115200
UART2 baud rate	115200
RS485 support	Disabled
Transparent mode	Enabled
Transparent device	1
Master/Slave mode	Slave
AP SSID	uFR Online Serial number (ONxxxxxx)
AP password	None
Login username	ufr
Login password	ufr
Discovery server port	8880
Master mode POST request	Enabled
Master mode UDP broadcast	Enabled
Master mode UDP broadcast address	Local broadcast address (eg. X.X.X.255)
Master mode linear read	Disabled
Default BLE mode PIN	123456



uFR Online REST services

In the table below are described all REST services available on uFR Online. <u>The HTTP method is POST. Basic</u> <u>Authorization is needed except for /uart1 and /uart2. Username and password are the same as Login.</u>

URL	Parameters	Description
/info	None	Get configuration info.
/scan	None	Get available WiFi networks.
/togglemode	None	Toggle master/slave mode.
/toggletransparent	None	Toggle transparent mode.
/changetransparent	None	Change transparent device.
/changeap	ssid, password	Change device AP SSID and password.
/changehost	host	Change master mode host.
/changebroadcast	ip	Change master mode UDP broadcast IP.
/changeauth	username, password	Change authorization credentials.
/changesta	ssid, password	Connect to the WiFi network.
/setport	port1, port2	Change UDP/TCP ports.
/disconnect	None	Disconnect from WiFi network.
/restart	None	Reboot device.
/toggleserver	None	Toggle UDP/TCP protocol. Only in slave mode.
/toggleble	None	Toggle BLE mode.
/setbaud	uart1, uart2	Change UART1 and UART2 baud rates.
/setdefaultbaud	uart	Reset connected uFR device to default baud rate.
/toggle485	None	Toggle UART2 RS485 support.
/setdefault	None	Reset device to factory default settings.







/togglepost	None	Toggle master mode POST request.
/togglebroadcast	None	Toggle master mode UDP broadcast.
/togglelinear	None	Toggle linear read. Only in master mode.
/changelinearmode	mode	Change linear read mode (1-8).
/changelinearsize	begin, size	Change linear read address and size.
/changelinearauth	auth	Change linear read authmode (0x60, 0x61)
/changelinearkeyindex	index	Change linear read key index (0-31).
/changelinearkey	HEX string	Change linear read key.
/uart1	HEX string	Send HEX string command to UART1.
/uart2	HEX string	Send HEX string command to UART2.
/tooglebt	None	Toggle BT Serial mode.
/togglesleep	None	Toggle Modem sleep.
/update	requested_fw_version	Request firmware and update.
/getufrlist	uart	Get the uFR Nano firmware list.
/ufrupdate	uart, vers	Update uFR Nano. Request /getufrlist first.
/changeblepin	pin	Change BLE passkey.
/setrtc	rtc	Set RTC UTC date/time.
/getrtc	None	GET request returns RTC UTC date/time.
/getled	None	GET current LED colors (r1g1b1r2g2b2) in HEX
/setled	HEX colors string	Set LED colors
/togglestatic	None	Toggle static/DHCP IP address
/changestatic	ip, mask, gateway, dns	Change static IP address parameters
/getgpios	None	Get all GPIOs states separated by comma.
/setgpios	GPI01, GPI02	Set GPIO state (0 - Low, 1 - High, 2 - Input). Multiple GPIOs can be set in one request using POST parameters (ex. GPIO1=1&GPIO2=0)





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/setbletxpower	bletxpower	Set BLE TX power in range 0 to 7
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uFR Online Reader basic usage

In this section will be described how to use uFR Online reader.

UDP/TCP communication

- All bytes sent to UDP/TCP port 1 will be forwarded to UART1 and vice versa.
- All bytes sent to UDP/TCP port 2 will be forwarded to UART2 and vice versa.
- uFR Series libraries have support for UDP/TCP communication.
- UDP/TCP mode works in parallel with Transparent and HTTP mode.

UDP/TCP communication – Reader opening example

/* Opening reader on IP address 192.168.1.112 and port 8881 for UDP communication. */ ReaderOpenEx(0, "192.168.1.112:8881", 'U', 0); /* Opening reader on IP address 192.168.1.112 and port 8881 for TCP communication. */ ReaderOpenEx(0, "192.168.1.112:8881", 'T', 0);

BT serial mode communication

- All bytes sent to the BT serial port will be forwarded to UART1 or UART2 and vice versa.
- BT serial mode doesn't work in parallel with UDP/TCP and HTTP mode.

BT serial mode communication – Reader opening example

/*

*/

Opening reader in BT serial mode on virtual port COM34. Must disable reset on opening.

ReaderOpenEx(2, "COM34", 0, "UNIT_OPEN_RESET_DISABLE");



BT serial mode communication

- All bytes sent to the USB serial port will be forwarded to UART1 or UART2 and vice versa.
- Transparent mode works in parallel with UDP/TCP and HTTP mode.

Transparent mode communication – Reader opening example

```
/*
Opening reader in Transparent mode using ReaderOpen function.
*/
ReaderOpen();
/*
Opening reader in Transparent mode using ReaderOpenEx function. Must disable reset on opening.
*/
ReaderOpenEx(1, 0, 0, "UNIT_OPEN_RESET_DISABLE");
```

HTTP mode communication

- All HEX string bytes sent in the POST body will be forwarded to UART1 or UART2 and vice versa.
- HTTP mode works in parallel with UDP/TCP and Transparent mode.

HTTP mode communication – GetCardIdEx example

/* Getting Card ID in HTTP mode using HTTP POST request. */

HTTP POST Request body sent to uFR Reader /uart1 or /uart2 > 557caa00aaccec

HTTP POST Response body sent from uFR Reader > de7ced0b08044f52dad9950000000000cb



uFR Online Reader protocols structure

In this section will be described how to use uFR Online reader.

Master mode POST request

- In master mode if a card is detected, the device sends HTTP POST request to the host.
- HTTP response must be "OK" or "FAILED" for firmware version 1.5.4 and below.
- If the response is "OK", device will beep once and turn on green LED.
- If the response is "FAILED", the device will beep twice and turn on the red LED.
- If the server doesn't respond, the device will beep three times and turn on the red LED.
- For firmware version 1.6.0 and above see Master mode POST response protocol section.

	Master mode HTTP POST request structure									
* Form parameters										
Linear read disabled	SN	SN UID CTRLINFO ONLINE								
Linear read enabled	SN	UID	CTRLINFO	ONLINE	DATA					
Description	Reader Serial number	Card UID	Control number from 0 to 255	Number 1 or 2 depends of reader	Linear read data as HEX string					



Master mode POST response

- When the server receives a POST request, uFR Online is waiting for an HTTP response.
- Response contains HEX String commands from uFR COM protocol.
- Response must contain 3 rows delimited by newline character (\n), one for each UART.
- CMD-EXT must be sent in one string preceded by CMD, without any delimiter.
- Sending multiple commands can be done by spliting multiple strings with whitespace delimiter.

	Master	mode HTTP POST respo	onse st	ructure							
Command sent to UART2	١n	Command sent to UART1		Command sent to Transparent UART							
Example - Sending USER_INTERFACE_SIGNAL command to UART1 and UART2											
5526AA000101E0	١n	5526AA000000E0	\n	0							
Command sent to UART1	\n Command sent to UART2		\n	Nothing sent to Transparent UART							
Example - S	ending U	SER_DATA_WRITE com	mand t	o UART1 (CMD_EXT)							
551CAA110000F96A 6A0000360000003000 32003800410054	١n	0	\n	0							
Command sent to UART1	\n	Nothing sent to UART2	\n	Nothing sent to Transparent UART							

PHP Server API for handling Master mode request with example is available at: <u>https://www.d-logic.net/code/nfc-rfid-reader-sdk/ufr_online-examples-php-master_mode</u>



Master mode UDP broadcast

• In master mode if a card is detected and UDP broadcast is enabled, the device sends a UDP broadcast.

- If the HTTP POST request is enabled, the indication is the same as described above.
- If the HTTP POST request is disabled, the device will beep once and turn on a green LED.

Master mode UDP broadcast structure

80/ReaderSerialNumber/CardUID/0

UDP discovery server

- The UDP discovery server is used for finding uFR readers in the local network.
- Send any UDP packet to uFR reader port 8880 and wait for response.

						UDP	disco	very s	server	respo	onse e	xamp	le					
* UART 1 PORT UART 2 PORT																		
* IP address Port CP Baud rate									Port CP Baud rate									
DEC	192	168	1	5	88	81	'T'		115	200		88	82	'U'		250	000	
HEX	CO	A8	01	05	B1	22	54	4 00 C2 01 00					22	55	90	DO	03	00
			*CP i	s a n	etwoi	rk con	nmunia	ation	protoc	ol. 'T' s	tands	for TC	P and	'U' for	UDP.			



Master mode flow diagram

Case 1: First Server available and second server not available (second server host URL is empty). Additional parameters (if set) are appended to POST request.



Case 2: First Server available and second server available (second server host URL is set). Additional parameters (if set) are appended to each POST request respectively..





uFR Online only COM protocol commands

- This commands are uFR Online only.
- Commands are sent in ASCII mode
- Commands are used in Transparent, BT Serial and BLE mode.

Command	Description
!TURN_MST_MODE_ON!	Toggle device to WiFi master mode.
!TURN_SLV_MODE_ON!	Toggle device to WiFi slave mode.
!TURN_BLE_MODE_ON!	Toggle device to BLE mode.
!TURN_SPP_MODE_ON!	Toggle device to BT Serial mode.
!TURN_HID_MODE_ON!	Toggle device to BLE HID mode.
!TURN_APO_MODE_ON!	Turn off Access Point when BT/BLE is used.
!TURN_AP1_MODE_ON!	Turn on Access Point when BT/BLE is used.
!TURN_LDO_MODE_ON!	Turn off LED indication when BT/BLE is used.
!TURN_LD1_MODE_ON!	Turn on LED indication when BT/BLE is used.



uFR Online Reader tools

In this section will be described available uFR Online reader tools.

uFR Online flasher oneclick – Update tool

- This tool is used for installing firmware and OEM unlocking device.
- Download tool from: <u>www.d-logic.net/code/nfc-rfid-reader-sdk/ufr_online-flasher-oneclick</u>

uFR Online USB to	cools				×
COM PORT	COM50 V R Connect uFR Online	Serial number:	MAC address:	Hardware version: WiFi+BLE	
	Firmware install tool		Reset to default tool	OEM unlock tool - Developers only	
	Available versions: 1.5.2W,Custom UDP broadcast address added.	~		OEM lock	
	Install firmware		Reset to factory defaults	OEM unlook	
STATUS: CONNEC	TED OEM: LOCKED				

uFR Online finder – Network discovery tool

- This tool is used for finding device in the local network.
- Download tool from: <u>www.d-logic.net/code/nfc-rfid-reader-sdk/ufr_online_finder</u>

🖳 uf	R Online tester											- 0	Х
			Scan for uFR On	ine readers			, i	Jsername ufr		Password **	**]	
	Serial number	IP address	Port 1	Port 1 protocol	UART1 baudrate	Port 2	Port 2 protocol	UART2 baudrate	UI Signal	Toggle mode	Done	Encryption	
•		192.168.1.143	8881	TCP	115200	8882	TCP	115200	Веер	Toggle	Reset	Check	



uFR Online OEM lock/unlock

CAUTION!!!

Devices OEM lock and unlock state can only be changed 6 times (unlock -> lock -> unlock -> lock -> unlock -> permanent lock). After that, when you lock it again, the OEM will be permanently locked!

In this section will be described how to OEM lock and unlock device. By default the device is OEM locked.

• If the device is OEM **locked**, you can install only official firmware.

• If the device is OEM **unlocked**, you cannot install official firmware. Unlocked device can be used as a development platform for writing your application in ESP-IDF, Arduino, Micropython and other available platforms for ESP32.

For locking and unlocking device, uFR Online flasher oneclick – Update tool is used.

OEM lock

In this section will be described how to OEM lock device.

- 1. Open uFR Online flasher oneclick Update tool
- 2. Select COM port and click button connect.
- 3. Wait for the connection to be made successfully.
- 4. Click on the OEM lock.
- 5. Wait for the locking process to finish.
- 6. After process is done, the latest firmware will be installed.

OEM unlock

In this section will be described how to OEM unlock device.

- 1. Open uFR Online flasher oneclick Update tool
- 2. Select COM port and click button connect.
- 3. Wait for the connection to be made successfully.
- 4. Click on button OEM unlock.
- 5. Wait for the locking process to finish.
- 6. After process is done, 'hello world' app will be installed on device.

45



***Unlocked device restrictions: ESP32 efuse BLK1 and BLK3 are reserved and cannot be used. Also, flash encryption must be disabled.



uFR NFC Browser Extension

In this section will be described how to use uFR NFC Browser extension with uFR Online reader.

uFR NFC Browser Extension – Useful links

Google Chrome and Opera download link:

https://chrome.google.com/webstore/detail/nfc-reader-browser-extens/kjfmmgpfhdohhcodbkaodgkidben kgog

Mozilla Firefox download link: https://addons.mozilla.org/en-US/firefox/addon/nfc-reader-browser-extension/?src=search

Native host installers for Window, Linux and MacOS download link: <u>https://www.d-logic.net/code/nfc-rfid-reader-sdk/ufr-browser_extensions/tree/master/Store%20installer</u> <u>s</u>

uFR NFC Browser Extension demo web app: <u>https://www.d-logic.net/browser-extension-demo/</u>

uFR Reader API reference document:

https://www.d-logic.net/code/nfc-rfid-reader-sdk/ufr-doc/blob/master/uFR%20Series%20NFC%20reader% 20API.pdf



uFR NFC Browser Extension - UDP reader opening example

ReaderOpenExUDP	- 0	ip_address:port	UO	SEND	J	

uFR NFC Browser Extension - TCP reader opening example

ReaderOpenExTCP 0 ip_address.port T 0 SEND

uFR NFC Browser Extension - BT serial reader opening example

|--|

uFR NFC Browser Extension - Transparent serial reader opening example

ReaderOpenEv Transparent - 2			SEND
ReaderOpenExTransparent - 2 port	rt_name 0 UNIT_OPEN_RESE	ET_DISABLE	SEND



Revision history

Date	Version	Comment
2019-04-11	1.0	Base document.
2019-05-09	1.1	Master mode communication protocol changed.
2019-06-17	1.2	Added firmware 2.0+ changes.
2019-06-20	1.3	RTC and IO pins control added.
2019-06-24	1.4	OEM lock/unlock.
2019-07-19	1.5	uFR Test added.
2019-08-09	1.6	HID reverse UID option added.
2019-09-20	1.7	Static IP address option added.
2020-02-11	1.8	Added UART async mode and uFR protocol async mode.
2020-02-13	1.9	BLE receiving data mode
2020-03-12	2.0	DESFire UID, additional custom POST parameters
2020-03-25	2.1	Cloud IoT support
2020-04-29	2.2	Log mode support
2020-05-26	2.3	UDP broadcast settings
2020-05-27	2.4	Network timeout settings
2021-01-12	2.6	Transparent mode reader opening updated
2021-01-18	2.7	Added brightness control and AP Tag polling timeout
2021-03-03	2.8	BLE Security settings
2021-05-27	2.9	HTTP rest API updated.

49







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2021-08-31	3.0	BLE TX power added.
2021-09-07	3.1	BLE/Network combination mode added.
2021-10-04	3.2	Master mode flow diagram added. UID format added.
2021-10-29	3.3	Updated
2021-12-09	3.4	Mobile AID added. Cardholder mode added.
2022-02-01	3.5	Combine mode and UDP broadcast details added.
2022-04-02	3.6	UART2 force mode option added.

50