

WEB08S

USER MANUAL

TCP/IP ETHERNET

HTTP WEB CLIENT

RFID TERMINAL

Version SP01

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AVEA International Company Limited

(<http://avea.cc>)

Table of Contents

Table of Contents	1
WEB08S TCP/IP Ethernet HTTP Web Client RFID Terminal	3
1. SETUP THE READER.....	4
1.1 DEFAULT SETTINGS	4
1.2 RESET WEB08S TO DEFAULT	4
1.3 FORCE DHCP MODE.....	4
2. INSTALLATION.....	6
2.1 POWER REQUIREMENTS	6
2.1.1 Terminal Block	6
2.1.2 Power from Cat-5/e Ethernet cable	7
2.2 EXTERNAL RELAY CONTROL.....	7
2.3 CONTACT SWITCH	8
2.4 SLAVE READER	8
2.5 MECHANICAL DIMENSIONS:	9
3. SOFTWARE	10
3.1 REQUESTS TO HTTP SERVER	10
3.1.1 \avea.php	10
3.1.2 \$date and \$time	10
3.1.3 \$id.....	10
3.1.4 \$code	11
3.1.5 \$cmd.....	11
3.1.6 \$type	11
3.1.7 \$mode	11
3.1.8 \$ver.....	12
3.1.9 \$contact.....	12
3.1.10 \$sid	12
3.1.11 \$ulen	12
3.1.12 \$uid.....	12
3.1.13 \$deviceid	12
3.1.14 \$md5.....	13
3.2 RESPONSES FROM HTTP SERVER	14
3.2.1 HB=xxxx.....	14
3.2.2 BEEP=x	14
3.2.3 CK=YYYY-MM-DD HH:MM:SS.....	14

3.2.4 GRNT=x	15
3.2.5 DENY	15
3.2.6 ROOT=xxxxxxxx	15
3.2.7 EXT=x	15
3.2.8 DHCP=x	16
3.2.9 IP=xxx.xxx.xxx.xxx	16
3.2.10 GW=xxx.xxx.xxx.xxx	16
3.2.11 NM=xxx.xxx.xxx.xxx	16
3.2.12 WS=xxx.xxx.xxx.xxx	17
3.2.13 PT=xxxx	17
3.2.14 RLY=x	17
3.2.15 SID=xxxxxxxx	17
3.2.16 MD5=xxxxxxxxxxxxxxxx	17

4. PHP CODE EXAMPLE 18

WEB08S TCP/IP Ethernet HTTP Web Client RFID Terminal



WEB08S is a TCP/IP Ethernet based RFID terminal for reading 125KHz type RFID cards. It is implemented as a standalone HTTP web client (i.e. no extra computer is needed).

Upon RFID card detected by the reader, it will sent a GET request to the web server and requesting the page \avea.php. The server responses with standard HTTP reply to reader

with embedded controls between <AVEA> and </AVEA> tags.

Various page extension are selectable, like .php, .asp, .cfm, .pl, .htm, .html and aspx. So various HTTP web server systems (e.g. IIS and ASP from Microsoft; Apache with PHP with MySQL database server from Unix/Linux; standard html web server).

Since the system is a standard web based system, no programming is required. Just a simple design of a web page, a complete and powerful access control system and time attendance system can easily be implemented.



1. Setup the reader

In order to work properly, WEB08S must be configured correctly. For normal condition, the blue LED is blinking. While relay is engaged, the red LED will be lighted up simultaneously.

In order to setup the reader, a web server is expected at 192.168.1.1 with \avea.php. And the avea.php contains the expected settings for the reader. Power up the reader with the default settings. It will try to connect the web server and get the settings. The settings stored in the reader is preserved after power off. Then the reader can be deployed to the production field.

1.1 Default Settings

The default configurations of the WEB08S is listed as follows:

Parameter	Description	Default
IP	IP address of the reader itself	192.168.1.234
GW	Gateway IP address	192.168.1.1
NM	Netmask	255.255.255.0
WS	HTTP server IP address	192.168.1.1
PT	HTTP server port number	80
EXT	Page extension	php

1.2 Reset WEB08S to default

Before power up, put a jumper cap over J4. When power on, the settings of WEB08S will be cleared and set to the default condition. It must be removed for normal operation.

1.3 Force DHCP mode

When a jumper cap put over J6. DHCP mode will be forced for automatic configuration of the WEB08S. The DHCP server must be configured to response the options www-server,

i.e. option 72.

Example of dhcpd.conf:

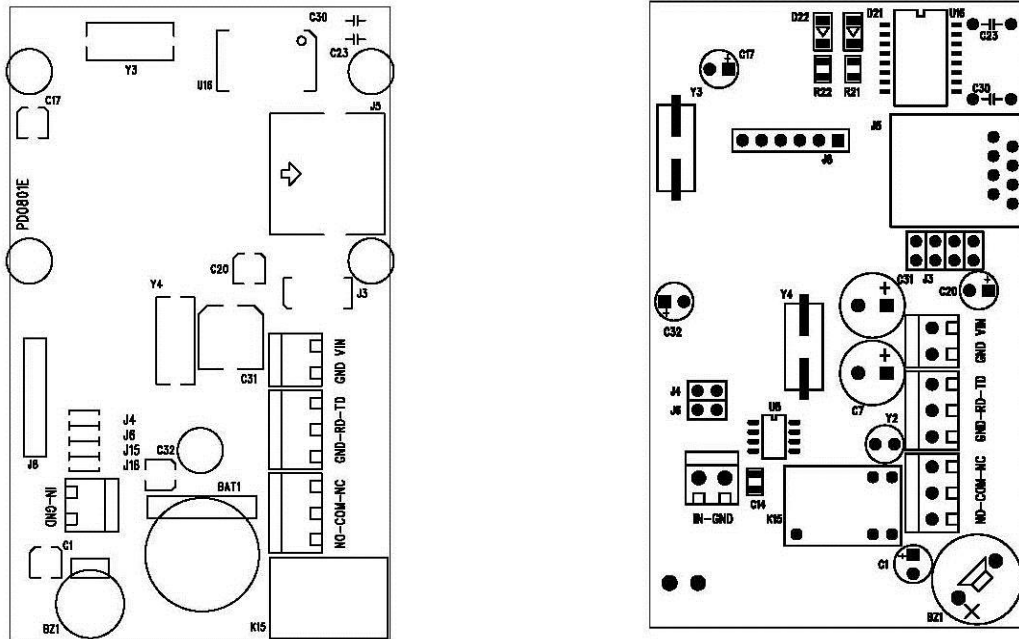
```
#example of dhcpd.conf for web08s
ddns-update-style      ad-hoc;

subnet 192.168.1.0 netmask 255.255.255.0 {
    # --- default gateway
    option routers 192.168.1.1; # default gateway
    option subnet-mask 255.255.255.0; # netmask
    option www-server 192.168.1.123; # it must setup to the web server's IP
    range dynamic-bootp 192.168.1.10 192.168.1.99;
    default-lease-time 300;
    max-lease-time 3600;
}
```

2. Installation

In order to work properly, WEB08S must have stable power supply, a 10-baseT Ethernet connection, an optional slave reader and an optional electric strike or magnetic lock.

There are two versions of PCB for the WEB08S:



There is no electrical difference but the terminal blocks' layout is changed.

2.1 Power Requirements

WEB08S requires 9 to 12V DC 500mA for normal operation. There are two ways to supply the power to the reader:

2.1.1 Terminal Block

Apply the power supply to the terminal block J11, with positive terminal to VIN and negative terminal to GND (ground). The voltage can be 9V to 12V and the minimum current rating is 500mA or bigger.

2.1.2 Power from Cat-5/e Ethernet cable

Besides the supply power through J11, the power can go through the Ethernet cable on the RJ45 connector, where Pin 7 and 8 is connected to GND (ground), and Pin 4 and 5 is connected to VIN. Meanwhile, jump block J3 must be shorted out by four two-pin jumper headers.

2.2 External Relay Control

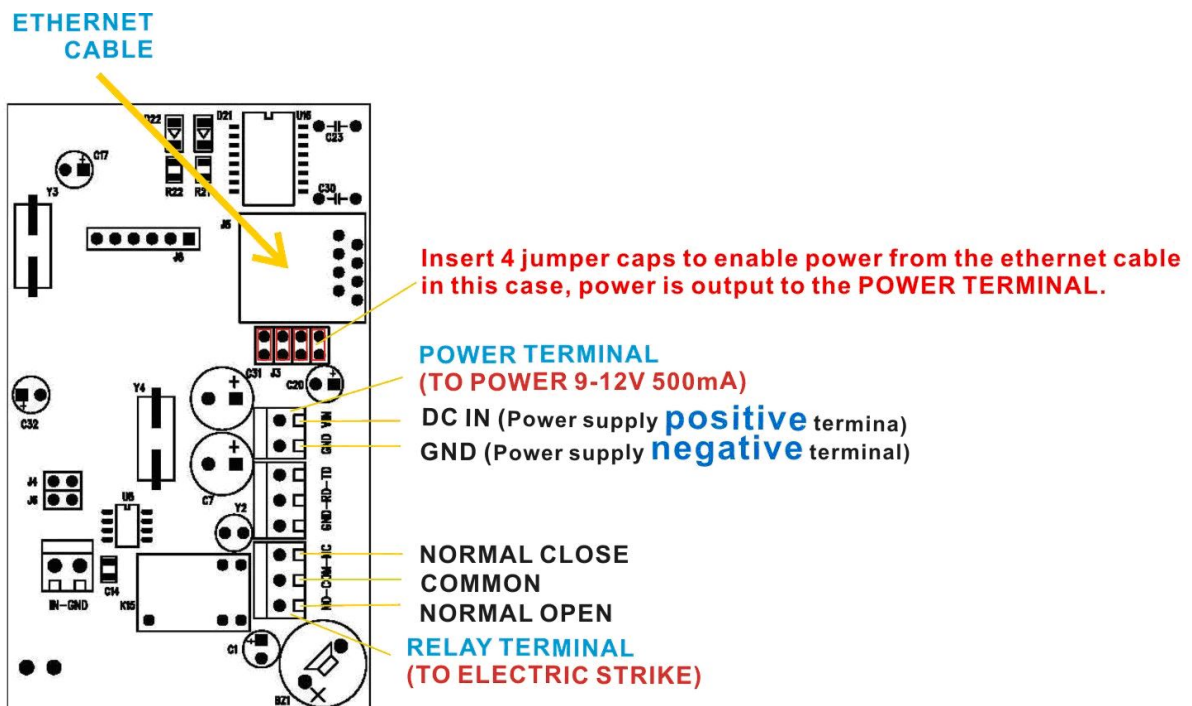
WEB08S is built-in with a controllable relay output on the terminal block J9, where:

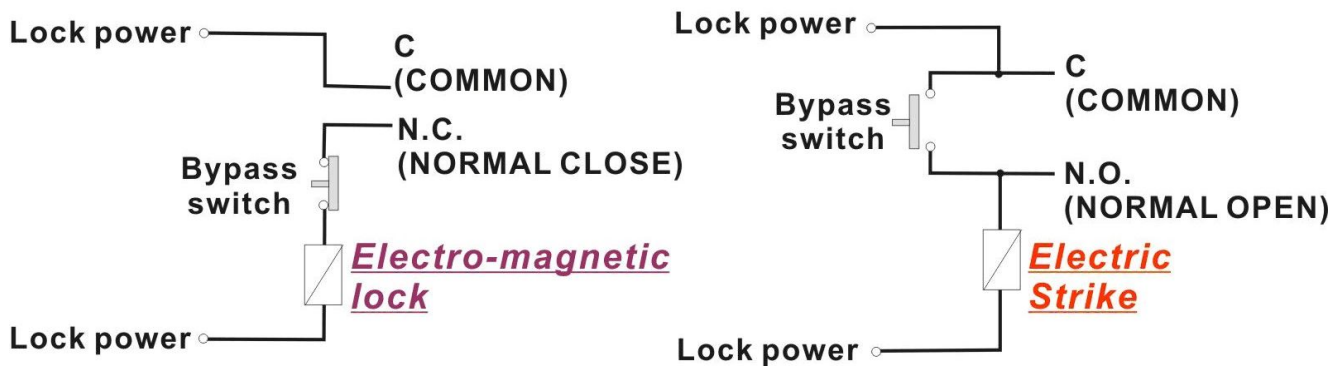
NC - normal close, it is connected to C normally.

C - common, it will connects to either NO or NC, but not both.

NO - normal open, it is open circuit normally.

The maximum switching voltage of the relay is 120VAC or 60VDC, and the maximum switching current is 2A. It can be used to connect to the bypass switch of an electric strike for door access controlling. Overloading the maximum ratings may cause damages to the reader permanently and cannot be repaired anymore.



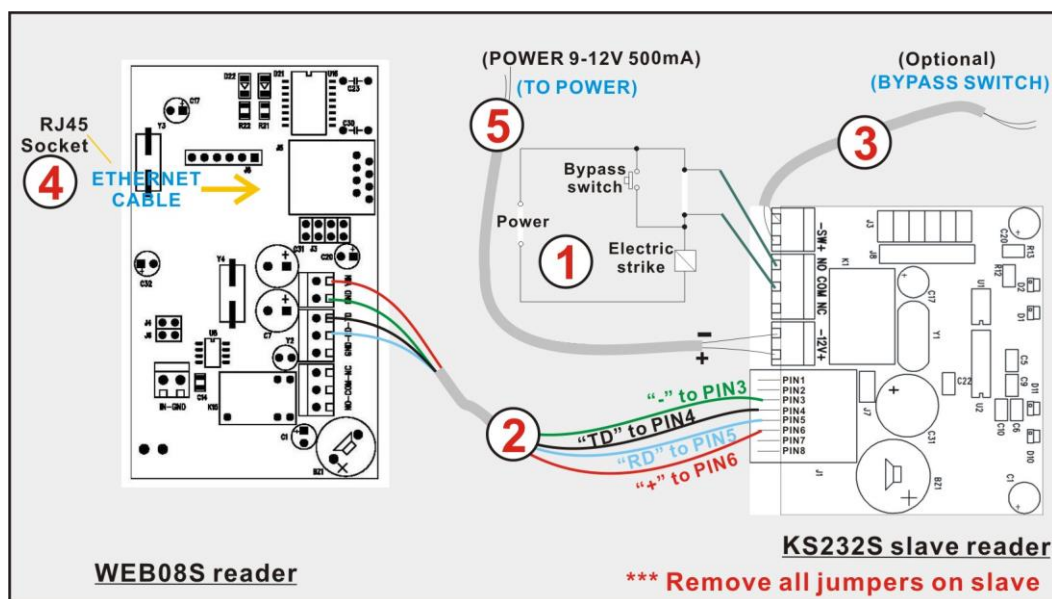


2.3 Contact Switch

WEB08S allows a external contact switch (i.e. a push button) to be connected to the SW terminals. The changes of its status (i.e. shorted or opened), will post corresponding messages to the web server.

2.4 Slave Reader

WEB08S allows a slave reader (MODEL NO: KS232S) to work together and the host software can identify the actions is come from the WEB08S or the slave reader by check the variable \$type. The following is the connection diagram assuming the WEB08S is installed outside the premises while the slave reader is installed inside the premises.



Remarks:

1. Connection to the electric strike.
2. Connection from the slave reader to WEB08S which consists of 4 wires, power '+' and '-', and data signals RD and TD.
3. Connection to an internal bypass switch.
4. Connection to Ethernet network.
5. Connection to power supply for WEB08S and the slave reader.

2.5 Mechanical Dimensions:

Height: 97mm

Width: 57mm

Depth: 24mm

3. Software

WEB08S is a HTTP client with PHP enabled. It will send PHP URL requests to the HTTP server with the various parameters. And it accepts responses from the HTTP server to perform various actions on the reader.

3.1 Requests to HTTP server

The followings are the variables presented to the PHP. User can access it correspondingly.

3.1.1 \avea.php

The reader send a GET request to access a fixed web page of the HTTP server: avea.php located on the root of the website. The file extension is user selectable, e.g. avea.asp, avea.cfm avea.pl, avea.htm and avea.html. But it is server changeable to any numeric filename located on the root.

3.1.2 \$date and \$time

Hold the date and time of that request. The format of date is YYYY-MM-DD, e.g. 2007/01/23 means 23rd Jan 2007. The format of time is HH:MM:SS where HH is hour, MM is minute and SS is second. Make sure the date and time of the reader is set, otherwise it may not work properly.

3.1.3 \$id

It is the IP address of the reader, e.g. 192.168.1.234. It must be set to different value for each reader in order to function properly.

3.1.4 \$code

It is the unique code number of the ID card presented to the reader.

3.1.5 \$cmd

It holds the action that was taken on the reader.

- I. \$cmd=PU, it is sent once after the reader is just power up.
- II. \$cmd=CO, it is sent with an ID card is read on the reader. The card number is stored in \$code.
- III. \$cmd=HB, it is sent when the programmed heartbeat rate is reach. The default heartbeat rate is 300 seconds.
- IV. \$cmd=SW, it is sent once when contact switch is just shorted or opened.
- V. \$cmd=PG, it is sent when the reader is being pinged.

3.1.6 \$type

It defines the action is coming from the WEB08S or the slave reader.

- I. \$type=m, the action is coming from the WEB08S.
- II. \$type=s, the action is coming from the slave reader.

3.1.7 \$mode

For internal use, \$mode indicates the operating mode.

3.1.8 \$ver

For internal use, \$ver indicates the software version.

For \$ver=1.3 or lower, it is standard WEB08S.

For \$ver=1.4 or above, it is WEB08S-SP01.

3.1.9 \$contact

It is used with \$cmd=SW to indicate the state of the contact switch. If the switch is opened, \$contact=OPEN. If the switch is closed, \$contact=CLOSE.

3.1.10 \$sid

This is the value set by the SID response.

3.1.11 \$ulen

It is the byte length of the UID of the EM card. It should be 5.

3.1.12 \$uid

It is the UID of the EM card, the string is in hexadecimal format and is of variable size. \$ulen tells the length.

For examples:

for \$ulen=5, \$uid=309E80732F

3.1.13 \$deviceid

This is the 32-bit unique ID of the reader.

3.1.14 \$md5

It is the MD5 checksum of the user's MD5 secret key, date and time. It will be sent together in the request for identification purpose.

For examples:

assuming

- MD5 secret key is '01234567' (ASCII),
- date of the request is '2012/08/08' (ASCII),
- time of the request is '10:19:54' (ASCII)

the combined string is

- '012345672012/08/08-10:19:54' (ASCII)

hence the MD5 checksum of the combined string is

- b62a8cf4adfd10874f1121686b0bba9

On the server side, the MD5 secret key is known, so it can compute the MD5 checksum and check against the received checksum for verification.

Since the MD5 secret key is unknown to others, only those authenticated reader can send out correct MD5 checksum.

3.2 Responses from HTTP server

After sending request, WEB08S will wait for a response from the HTTP server. It looks for the starting flag <AVEA> and the ending flag </AVEA>. Then it interprets the strings in between. There must be no space between the keywords and parameters. The maximum size of the response packet should be less than 600 bytes.

The following responses are supported:

3.2.1 HB=xxxx

Set the heartbeat rate of the reader in seconds. It is a fixed length format in decimal value. Example:

HB=0300 set the reader send a heartbeat request to the HTTP server once in 300 seconds.

HB=0000 to disable the heartbeat request.

3.2.2 BEEP=x

Make a beep sound on the reader. It is a fixed length format. Example:

BEEP=1 make a short beep.

BEEP=0 make a long beep.

3.2.3 CK=YYYY-MM-DD HH:MM:SS

Set the clock of the reader. The year must be in 2000 to 2099. It is a fixed length format in decimal values. Example:

CK=2007-01-23 12:34:56 set the clock to 23rd Jan 2007, pm12:34:56.

3.2.4 GRNT=xx

Set the reader to a grant access state, i.e. to engage the relay from NO state to NC state for xx seconds and return to NO state. Meanwhile a LED will be turn on and off simultaneously. It is a fixed length format in decimal value. Example:

GRNT=03 set the relay to NC state and LED on for three seconds and return to NO state and LED off.

3.2.5 DENY

Set the reader to a deny access state, i.e. to make sure the relay is in NO state.

3.2.6 ROOT=xxxxxxxx

This will change the root page to be access by the reader. It is a fixed length format in decimal value. For example: ROOT=00024689, this will make the reader to access the page /24689.php rather than the default /avea.php. By setting ROOT=00000000 will reset to access the default page.

3.2.7 EXT=x

This will change the root page's file extension to be access by the reader. It is a fixed length format.

Value of x	File extension
0	.php
1	.asp
2	.cfm
3	.pl
4	.htm
5	.html
6	.aspx

3.2.8 DHCP=x

This will control DHCP feature of the reader. If DHCP=1, DHCP is enabled. If DHCP=0, DHCP is disabled. If enabled, it will send requests to DHCP server to acquire the following items:

- host IP
- netmask
- default gateway
- www-server IP

3.2.9 IP=xxx.xxx.xxx.xxx

This is a fixed length command and values are in decimal. It will change the IP address of the reader. Example:

IP=192.168.001.234

3.2.10 GW=xxx.xxx.xxx.xxx

This is a fixed length command and values are in decimal. It will change the default router of the reader. Example:

GW=192.168.001.002

3.2.11 NM=xxx.xxx.xxx.xxx

This is a fixed length command and values are in decimal. It will change the netmask of the reader. Example:

NM=255.255.255.000

3.2.12 WS=xxx.xxx.xxx.xxx

This is a fixed length command and values are in decimal. It will change the web server IP address to be accessed by the reader. Example:

WS=192.168.001.001

3.2.13 PT=xxxxxx

This is a fixed length command and values are in decimal. It will change the port number to be used to access the web server in decimal. Example:

PT=00080

3.2.14 RLY=x

This is a fixed length command and values are in decimal. If RLY=1, the relay will be turned on. If RLY=0, the relay will be turned off. The state of relay will be affected by the subsequence commands.

3.2.15 SID=xxxxxxxxxx

This is a fixed length command and values are in hexadecimal value. It is a non-volatile value and will not changed after power removed.

3.2.16 MD5=xxxxxxxxxxxxxxxxxx

This is a fixed length command and 64-bit values are in hexadecimal value. It is a non-volatile value and will not changed after power removed. This is the secret key used for computing MD5 checksum.

4. PHP Code Example

The following is an self explainable example of PHP script located on the HTTP server.
The filename is \avea.php.

```
<html>
<body>
<?php
// setup variables
$cmd=$_GET["cmd"];
$mode=$_GET["mode"];
$code=$_GET["code"];

$now=time(); // stamp the current time
$st=date('Y-m-d H:i:s',$now); // set the datetime string to correct format
$mycard=359452; // replaced by your card number
$rtime=$date . $time; // access the date and time of the reader
$remote_open=1;

echo "<AVEA>"; // starting flag
switch ($cmd) {
case "PU": // power up
    echo "CK=$st"; // set clock
    if ($mode==ID2) { // for web08s only
        echo "DHCP=1"; // turn on the DHCP feature
    }
    break;

case "CO": // card only
    if ($code==$mycard) {
        echo "MSG=3f737937"; // show message OPEN
        echo "GRNT=01"; // grant access
    } else {
        echo "DENY"; // deny access
    }
    break;

case "HB": // heartbeat
    echo "CK=$st"; // set clock
```

```
        break;

case "PG":    // being pinged
    if ($_GET["contact"]=="CLOSE") {
        echo "GRNT=01";    // grant access
    }
    break;

case "SW":    // being pinged
    if (remote_open==1) {
        echo "GRNT=01";    // grant access
    }
    break;
}
echo "</AVEA>";    // ending flag
?>
</body>
</html>
```