CooLinkNet
Programmers Reference Manual (PRM)

CooLinkNet
Universal Interface Adapter
for HVAC Systems

Document Revision 0.2 4/25/2016

Table of Contents

1 Document Revision History

Rev 0.1

- Preliminary

Rev 0.2

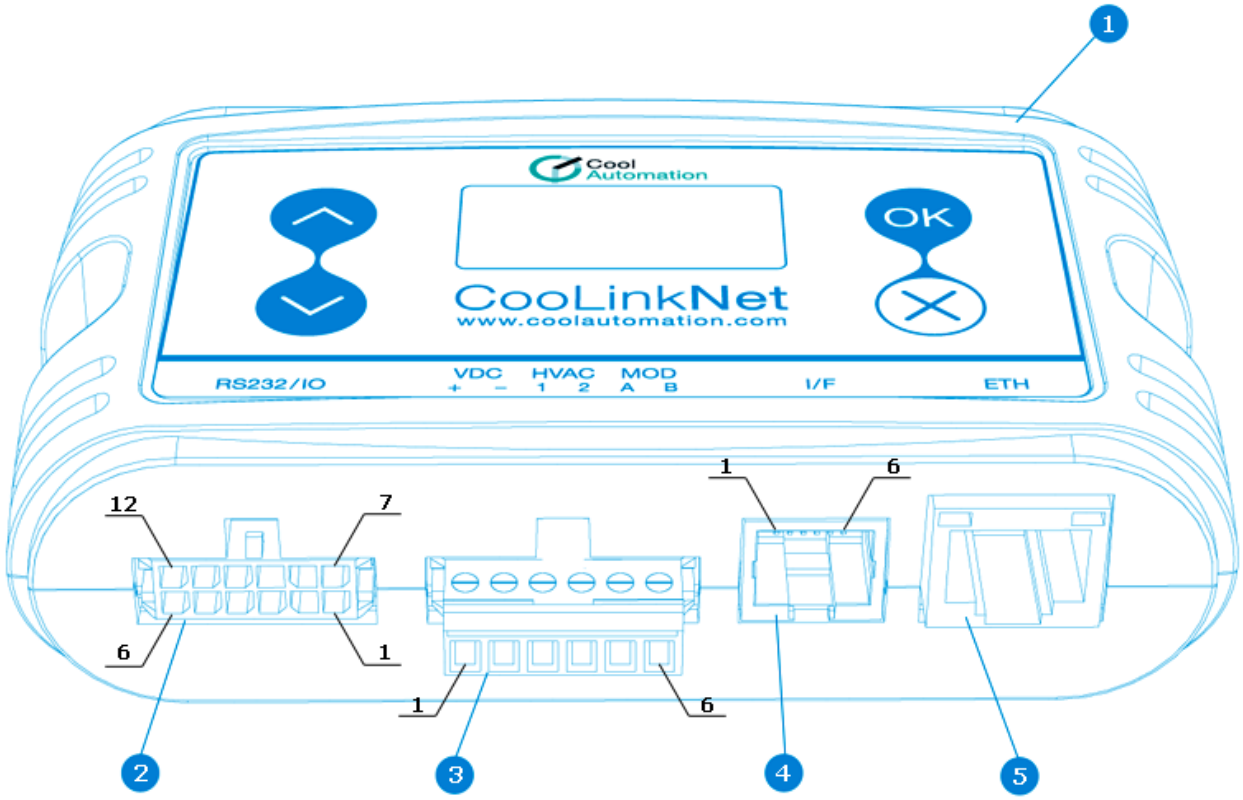
- Meitav-tec models supported: CTU 4500 3 BT, CTU4500 H3 WS, CTU4501 CP IRD 05, CTU4501 IRD 05, FMH485-02

2 Acronyms

DTE	Data Terminal Equipment
GPIO	General Purpose Input/Output
HVAC	Heating Ventilation and Air Conditioning
N.C.	Not Connected
TBD	To Be Defined

3 Outlines

3.1 Layout



(1) - Mini USB Device Connector

Used to connect CooLinkNet to PC USB Host for FW Update and maintenance.

(2) - RS232/IO Connector

Pin Number	Pin Name	Function
1	VDC+	Input Voltage
2	GPIO1	General Purpose IO
3	VDC-	Ground
4	GPIO2/CK	General Purpose IO
5	HVAC1	HVAC Line L2 / L4
6	HVAC2	
7	GPIO3/RS_TX	General Purpose IO
8	GPIO4/RS_RX	General Purpose IO
9	GPIO5/TX	General Purpose IO
10	GPIO6/RX	General Purpose IO

11	RS232_RX	RS232 ASCII Interface
12	RS232_TX	

(3) Power, HVAC, ModBus Connector

Pin Number	Pin Name	Function
1	VDC+	Input Voltage
2	VDC-	Ground
3	HVAC1	HVAC Line L2 / L4
4	HVAC2	
5	MOD_A	ModBus A(+) Terminal / HVAC Line L3
6	MOD_B	ModBus B(-) Terminal / HVAC Line L3

(4) I/F Connector

Pin Number	Pin Name	Function
1		N.C.
2	K1	HVAC Line L4 for CooLinkNet TD
3	K2	
4	VDC-	Ground
5	VDC+	Input Voltage
6		N.C.

(5) ETH Connector

RJ45 Ethernet connector

3.2 Models

Model	HVAC Manufacturer	Lines	
		Number	Name
CooLinkNet **ME**	Mitsubishi Electric	L4	M1M2
		L3	ModBus*
CooLinkNet **FJ**	Fujitsu	L4	FUS
		L3	ModBus*
CooLinkNet **TD**	Tadiran	L2	TI (Inverter)
		L4	TAD (Split)
		L3	ModBus*
CooLinkNet **MT**	Meitav	L2	MT(Meitav-tec)
		L3	ModBus*

ModBus* - Modbus RTU Slave for DTE integration.

4 Connections

DTE (Data Terminal Equipment) is used to denote the device connected to CooLinkNet e.g. PC or Home Automation Controller.

4.1 HVAC Lines

Depending on the specific CooLinkNet model it supports up to four HVAC Lines denoted as L1, L2, L3, L4. Below tables describe relation between physical connections and HVAC Line numbers.

- CoolLinkNet ME

Indoor Unit		CooLinkNet ME Connectors								HVAC Line	
Manufacturer	Terminal	RS232 /IO	VDC+	VDC-	HVAC 1	HVAC 2	MOD A	MOD B	I/F		Name
Mitsubishi Electric	TB6 No Polarity	2 wires								L4	M1M2

- CooLinkNet FJ

Indoor Unit		CooLinkNet FJ Connectors								HVAC Line	
Manufacturer	Terminals	RS232 /IO	VDC+	VDC-	HVAC 1	HVAC 2	MOD A	MOD B	I/F		Name
Fujitsu	RED BLACK WHITE									L4	FUS

- CooLinkNet TD

Indoor Unit		CooLinkNet TD Connectors								HVAC Lines	
Manufacturer	Terminals	RS232 /IO	VDC+	VDC-	HVAC 1	HVAC 2	MOD A	MOD B	I/F		Name
Tadiran Inverter	RED BLUE YELLOW GREEN									L2	TI
Tadiran Split	RJ11									L4	TAD

- CooLinkNet MT

Indoor Unit		CooLinkNet ME Connectors								HVAC Line	
Manufacturer	Terminal	RS232 /IO	VDC+	VDC-	HVAC 1	HVAC 2	MOD A	MOD B	I/F		Name
Meitav-tec	A(+) B(-)									L2	MT

Meitav-tec supported models:

Meitav-tec Model	CooLinkNet FW version
CTU 4500 3 BT	0.1.1
CTU4500 H3 WS	0.1.1
CTU4501 CP IRD 05	0.1.1
CTU4501 IRD 05	0.1.1
FMH485-02	0.1.1

4.2 RS232 Port

RS232 Interface on CooLinkNet is available from the RS232/IO connector. Adapter cable (if provided) will route RS232 signals to DB9 connector according to the table bleow

RS232/IO Pin	DB9 Pin	Signal Lvel	Description
12	2	±12V	TxD Data from CooLinkNet
11	3	±12V	RxD Data to CooLinkNet
3	5	GND	Ground
	1,4,6,7,8	N.C.	

Maximal length of the RS232 Cable should not exceed 25m. By default RS232 Interface is dedicated for ASCII I/F. The default CooLinkNet RS232 Port settings are listed below:

Baud Rate	9600
Data Bits	8
Parity Control	None
Stop Bits	1
Flow Control	None

4.3 Ethernet

CooLinkNet incorporates an IEEE 802.3 compatible 10/100 Mb/s Ethernet port supported via RJ45 connector. Below are main port features.

Parameter	Value	Notes
Max Ethernet Cable Length	137m	CAT5 twisted pair cable
Bit Rate	10/100 Mb/s	
Supported Ethernet Protocols	10BASE-T/100BASE-TX	
Protocol Auto-Negotiation	Enabled	Against Link Partner

RJ45 connector comprises Link and Activity indication LEDs used as specified below.

LED	Color	Function
Link Led	Green	ON for good link OFF for no link
Activity Led	Orange	BLINK for Tx/Rx Activity

Ethernet interface is used by a number of protocol modules available in CooLinkNet

- ASCII I/F (via ASCII I/F IP Server)
- ModBus IP
- CoolRemote

Network setting of the CooLinkNet are controlled with ifconfig command.

4.3.1 ASCII I/F IP Server

ASCII I/F IP Server referenced as **aserver** is a classic TCP/IP socket server. Aserver has the following default characteristics:

Maximal number of simultaneous connections	4	
Default TCP/IP port	10102	

4.3.2 ModBus IP

Currently under development.

4.4 RS485

By default terminals MOD A and MOD B (Line **L3)** are used as an RS485 Interface line for DTE connection. CooLinkNet supports the following RS485 based protocols:

- ModBus RTU (Slave mode)

4.4.1 ModBus RTU

CooLinkNet can be used as a ModBus RTU slave device working in accordance with Modbus-IDA.ORG "MODBUS over serial line specification and implementation guide". RS485 default frame format is

Baud Rate	9600
Data Bits	8
Parity Control	None
Stop Bits	1
Flow Control	None

4.5 USB

CooLinkNet incorporate USB Device port. USB Device port is used for maintenance operations.

4.6 Power

CooLinkNet depending on the specific model type can be powered from different power sources:

- AC/DC adapter via VDC+ and VDC- terminals
- 12-24V DC from HVAC or other equipment via VDC+ and VDC- terminals
- USB Device port

5 ASCII I/F

CooLinkNet provides simple and comprehensive ASCII I/F Protocol, based on text (ASCII) strings, representing verbal commands and responses . ASCII I/F implemented in CooLinkNet is fully backward compatible with previous versions of CooLink products line, but has a number of significant extensions and improvements mainly aimed to support additional CooLinkNet functionality. ASCII I/F can be utilized via RS232 interface (see RS232 Port) or TCP/IP ASCII Server.

5.1 General Protocol Definitions

5.1.1 Messaging

Communication between DTE and CooLinkNet via ASCII I/F is based on text (ASCII) strings. Communication example is shown below

```
>ls L2                                    ←command        DTE to CooLinkNet
L2.102 OFF 20C 27C Auto Cool OK    - 0    ←response
L2.103 OFF 20C 24C Low  Auto OK    - 0    ←exit code      CooLinkNet to DTE
OK                                        ←prompt
>
```

Command string sent to CooLinkNet must be terminated with <CR> (carriage return 0x0D) <LF> (line feed 0x0A) sequence or a single <CR> character. Strings from CooLinkNet (except prompt character) are always terminated with <CR> <LF>. Commands are case sensitive and should not contain leading or trailing spaces. The only separator between command name and command parameter(s) is space (0x20) character.
Configuration parameter **echo** (see set command), defines if characters sent to CooLinkNet via RS232 interface are echoed back or not. If **echo** is not zero - characters are echoed.
In case of RS232 interface, prompt character '**>**' is unconditionally sent by CooLinkNet. In case of ASCII Server prompt sending is configurable.

5.1.2 Exit Code

CooLinkNet provides Exit Code in verbose or numeric form. Numeric form format is
ERROR:N
where N is a number in range 0...999. If verbose format is not specified in table below it means error has only numeric format.

Numeric	Verbose	Description
0	OK	Command executed successfully
1		UID not found
2		UID must be precise
3	Bad Format	Command format is wrong
4	Failed	Command execution failed
5	Line Unused	Line is unused
6	Unknown Command	Command is unknown
7		Line number is wrong
8		Wrong function
9	Bad Parameter	Command parameter is wrong
10	OK, Boot Required!	Command execution will be effective after reboot

5.1.3 UID

UID is used to identify Indoor Unit or a set of Indoor Units. UID has the following format:

Line	Dot	Indoor Number	
LN	**.**	X	YY

- Line is a CooLinkNet HVAC Line number in range L1..L4. **L*** means "any line". In some cases to provide backward compatibility Line can be omitted from the UID.
- Dot is a separator between Line and Indoor Number. If Line is omitted or has a **L*** form, dot must also be omitted.
- Indoor Number is an Indoor Unit number in HVAC system. Indoor Number can be '*' that means "any"

Examples:

L1.102	Indoor Unit 102 on line L1
L2.003	Indoor Unit 003 on line L2
L*100	Set of Indoor Units 100 on all lines
L3.1*	Set of Indoor Units 1xx on line L3 (L3.100, L3.101, ...)
L4	All Indoors on line L4
L*	All Indoors on all lines
203	Similar to L*203 (for backward compatibility only)

5.2 Commands Reference

Synopsis and description of the commands listed below have the following notation:

- Parameters or parameters group in angle brackets **< >** are mandatory.
- Parameters or parameters group in square brackets **[ ]** are optional and can be omitted.
- The curly braces **( )** are used to denote group inside braces
- The **|** character between parameters inside brackets means OR.

5.2.1 Configuration Commands

set
line
ifconfig

set

SYNOPSIS

set [<SETTING> <VALUE>]
set defaults

DESCRIPTION

Query or change CooLinkNet setting(s). Without parameters **set** command will list all supported settings and their values. To change setting use format with **<SETTING>** and **<VALUE>**. Some settings are read only (RO) and can not be changed.

set defaults will load default values to all settings

<SETTING>	Mode	Printed as	Value*	Description
S/N	RO	S/N		CooLinkNet Serial Number
version	RO	version	X.Y.Z	CooLinkNet Firmware Version

app	RW	application	string	CooLinkNet Application
baud	RW	baud rate	1200...115200	RS232 Interface baud rate. Default: **9600**
echo	RW	echo	0 or **1**	RS232 Interface echo control. 0 - disabled, 1 - enabled
verbose	RW	verbose	0 0r **1**	Exit Code format. 0 - numeric, 1 - verbose
aserver port	RW	aserver port	integer	aserver TCP port. Default: **10102**
aserver prompt	RW	aserver prompt	0 or 1	aserver prompt control
deg	RW	deg C/F	**C** or F	Temperature scale Celsius or Fahrenheit

* - Bold values are defaults.

EXAMPLE

Disable echo:

```
>set echo 0
OK
>
```

Change aserver TCP port:

```
>set aserver port 12345
OK
>
```

Load defaults:

```
>set defaults
OK
>
```

line

SYNOPSIS

line
line <PROPERTY> <Ln> <VAL>

DESCRIPTION

Query or change HVAC Lines status and configuration. In format without parameters **line** command will provide information about current Lines status. Second format is used to change write enabled properties.

<PROPERTY>	Mode	Value	Description	Notes
master	R/W	0 or 1	CooLinkNet acts as a Master device	FUS,M1M2 only
simul	R/W	integer	Simulate given number of Indoor Units. To disable simulation use "0". Simulation is persistent (not disabled after power reset)	
myID	R/W	string	CooLinkNet Own address on given HVAC Line. **For ModBus RTU Line myID is a "Slave Device Address"**	
baud	R/W		Configure UART parameters for given Line. Value format is: <BAUD> <8|9><N|E|O><1|2> For example: 9600 8N1	Where applicable
Tx	RO	integer counter	Transmitted messages	Printed as Total/Last Last means since previous print
Rx	RO		Received messages	
TO	RO		Timeout errors	
CS	RO		Checksum errors	
Col	RO		Collision errors	
NAK	RO		NAK errors	

ambtemp	WO	0 or 1	Ambient temperature in Slave mode is taken from: 0 - Master device 1 - Indoor return air	M1M2 only

EXAMPLE

```
>line
  L1: Unused
   Tx:0/0 Rx:0/0 TO:0/0 CS:0/0 Col:0/0 NAK:0/0
  L2: TI U00/G00
   Tx:40/40 Rx:0/0 TO:39/39 CS:0/0 Col:0/0 NAK:0/0
  L3: CLMB Address:0x50(80) 9600_8N1
   Tx:0/0 Rx:0/0 TO:0/0 CS:0/0 Col:0/0 NAK:0/0
  L4: FUS Slave U00/G00 Not Connected
   Tx:0/0 Rx:0/0 TO:0/0 CS:0/0 Col:0/0 NAK:0/0
OK
```

Become Slave on Line L4

```
>line master L4 0
OK, Boot Required!
```

Set Line L3 baud rate to 19200, 8 data bits, even parity, 1 stop bit

```
>line baud L3 19200 8E1
OK, Boot Required!
```

ifconfig

SYNOPSIS

ifconfig
ifconfig <PROPERTY> <VALUE>
ifconfig enable|disable

DESCRIPTION

Query or configure Ethernet network settings. Without parameters, **ifconfig** command will list current configuration. To change configuration use format with **<PROPERTY>** and **<VALUE>**. Parameter **IP** can be set to **DHCP** (DHCP client) or fixed IP number. In case of DHCP - Netmask and Gateway values are provided by DHCP server. By default CooLinkNet is configured for DHCP client operation. CooLinkNet Ethernet module can be enabled or disabled with corresponding command.

EXAMPLE

Query

```
>ifconfig
MAC    : 28:3B:96:FF:FF:FE
Link   : Up
IP     : 192.168.1.109 (DHCP)
Netmask: 255.255.255.0
Gateway: 192.168.1.1
OK
```

Configure fixed IP and Gateway

```
>ifconfig IP 192.168.1.102
OK, Boot Required!
>ifconfig Gateway 192.168.1.0
OK, Boot Required!
```

Configure DHCP client operation

```
>ifconfig IP DHCP
OK
```

Disable Ethernet

```
>ifconfig disable
OK, Boot Required!
```

boot

SYNOPSIS

boot
boot [N]

DESCRIPTION

- <N> omitted - Enter Boot Mode
- <N> = 2 - Reset CooLinkNet

5.2.2 HVAC Status and Control Commands

on
off
cool
heat
fan
dry
auto
temp
fspeed
swing
filt
stat
ls
query
iset
feed
eco

on

SYNOPSIS

on [UID]

DESCRIPTION

Turn on Indoor Unit(s).

EXAMPLE

Turn on Indoor Unit 102 on line L1

```
>on L1.102
OK
>
```

Turn on all Indoor Units on Line L2

```
>on L2*
OK
>
```

off

SYNOPSIS

off [UID]

DESCRIPTION

Turn off Indoor Unit(s).

EXAMPLE

Turn on Indoor Unit 102 on line L1

```
>off L1.102
OK
>
```

Turn on all Indoor Units on line L2

```
>off L2*
OK
>
```

cool

SYNOPSIS

cool [UID]

DESCRIPTION

Set Indoor Unit(s) operation mode to cool.

EXAMPLE

Set Indoor Unit 102 on line L1 to cool mode

```
>cool L1.102
OK
>
```

Set all Indoor Units on line L2 to cool mode

```
>cool L2*
OK
>
```

heat

SYNOPSIS

heat [UID]

DESCRIPTION

Set Indoor Unit(s) operation mode to heat.

EXAMPLE

Set Indoor Unit 102 on line L1 to heat mode

```
>heat L1.102
OK
>
```

Set all Indoor Units on line L2 to heat mode

```
>heat L2*
OK
>
```

fan

SYNOPSIS

fan [UID]

DESCRIPTION

Set Indoor Unit(s) operation mode to fan.

EXAMPLE

Set Indoor Unit 102 on line L1 to fan mode

```
>fan L1.102
OK
>
```

Set all Indoor Units on line L2 to fan mode

```
>fan L2*
OK
>
```

dry

SYNOPSIS

dry [UID]

DESCRIPTION

Set Indoor Unit(s) operation mode to dry.

EXAMPLE

Set Indoor Unit 102 on line L1 to dry mode

```
>dry L1.102
OK
>
```

Set all Indoor Units on line L2 to dry mode

```
>dry L2*
OK
>
```

auto

SYNOPSIS

auto [UID]

DESCRIPTION

Set Indoor Unit(s) operation mode to auto.

EXAMPLE

Set Indoor Unit 102 on line L1 to auto mode

```
>auto L1.102
OK
>
```

Set all Indoor Units on line L2 to auto mode

```
>auto L2*
OK
>
```

temp

SYNOPSIS

temp [UID] [±]<TEMP>
temp [UID] <TEMP.d>

DESCRIPTION

Change Indoor Unit(s) Set Temperature.

- In form **temp <UID> [±]<TEMP>**

<TEMP> parameter must be decimal natural number. Command can work in relative or absolute manner. If plus '+' or minus '-' sign precedes **<TEMP>** parameter it's value will be added to or substituted from current Set Temperature value. Otherwise Set Temperature will be set to the given **<TEMP>** value.

- In form **temp <UID> <TEMP.d>**

Set Temperature parameter **<TEMP.d>** is a fractal number with 0.1 precision. (In this case preceding +|- are not allowed). If HVAC System does not support 0.1 precision for the Set Temperature (see table below), the final value will be nearest supported value.

AC Type	Set Temperature Precision
DK	0.1ºC
ME	0.1ºC

The **deg** setting (see set command) defines which temperature scale Celsius or Fahrenheit is used for **<TEMP>** and **<TEMP.d>** parameters value.

EXAMPLE

Set Indoor Unit 102 on line L1 Set Temperature to 23º

```
>temp L1.102 23
OK
>
```

Decrease all Indoor Units on line L2 Set Temperature by 2º

```
>temp L2* -2
OK
>
```

Set all Indoor Units on line L2 Set Temperature to 24.5º

```
>temp L2* 24.5
OK
>
```

fspeed

SYNOPSIS

fspeed [UID] <l|m|h|t|a>

DESCRIPTION

Set Indoor Unit(s) Fan Speed to:

- l - low
- m - medium
- h - high
- t - top
- a - auto

Not all Indoor Units support Fan Speed options listed above. Specific Fan Speeds support depend on specific Indoor Unit capabilities. If requested Fan Speed is not supported by Indoor Unit(s) **fspeed** command will have no effect.

EXAMPLE

Set Indoor Unit 102 on line L1 Fan Speed to low

```
>fspeed L1.102 l
OK
>
```

Set all Indoor Units on Line L2 Fan Speed to high

```
>fspeed L2* h
OK
>
```

filt

SYNOPSIS

filt <UID>

DESCRIPTION

Reset Filter Sign.

EXAMPLE

Reset Filter Sign on Indoor Unit 102 0n line L1

```
>on L1.102
OK
>
```

Reset Filter Sign on all Indoor Units on Line L2

```
>on L2*
OK
>
```

stat

SYNOPSIS

stat [UID]
stat2 [UID]
stat3 [UID]
stat4 [UID]

DESCRIPTION

Get Indoor Unit(s) status list.
These commands are deprecated and are not recommended for use in CooLinkNet. They are implemented for backward compatibility only. Detailed description of these commands can be found in the PRM of previous CooLink versions.

ls

SYNOPSIS

ls [UID]

DESCRIPTION

Get Indoor Unit(s) status list. If UID is omitted all Indoor Units connected to CooLinkNet will be listed.
Indoor Unit status line has strict format, so that every status field is printed in fixed position.

- Indoor Unit status line with Celsius temperature scale

```
012345678901234567890123456789012345678
L2.102 OFF 20C 27C High Cool OK   - 0
```

- Indoor Unit status line with Fahrenheit temperature scale

```
012345678901234567890123456789012345678
L2.102 OFF 120F 127F High Cool OK   - 0
```

Field	Position in string		Values
	Celsius	Fahrenheit	
UID	0-5		LN.XYY
On/Off	7-9		ON,OFF
Set Temperature	11-12	11-13	nnC or nnnF
Room Temperature	15-16	16-18	nnC or nnnF
Fan Speed	19-22	21-24	Low, Med, High, Top, Auto
Operation Mode	24-27	26-29	Cool, Heat, Fan, Dry, Auto
Indoor Failure Code	29-32	31-34	OK - no failure, else Indoor Failure Code
Filter Sign	34	36	- or # (Filter Sign)
Demand	36	38	0 or 1

EXAMPLE

```
>ls L2
```

```
L2.101 ON  25C 27C Low  Cool OK   - 1
L2.102 OFF 20C 27C High Cool OK   - 0
OK
>ls L2.101
L2.101 ON  25C 27C Low  Cool OK   - 1
OK
>ls
L1.101 ON  25C 24C Low  Cool OK   - 1
L1.102 ON  22C 23C Med  Cool OK   - 0
L2.101 ON  25C 27C Low  Cool OK   - 1
L2.102 OFF 20C 27C High Cool OK   - 0
OK
```

query

SYNOPSIS

query <UID_STRICT> <o|m|f|t|h|e|a|s>

DESCRIPTION

Query one of the operation conditions of given Indoor Unit. **<UID_STRICT>** parameter must define single Indoor Unit in form **LN.XYY** or **XYY** (see UID). Resulting value is printed as alpha-numeric value according to the table below.

Query	Operation Condition	Value
o	On/Off	0 - Off, 1 - On
m	Operation Mode	0 - Cool 1 - Heat 2 - Auto 3 - Dry 4 - Haux 5 - Fan
f	Fan Speed	0 - Low 1 - Medium 2 - High 3 - Auto 4 - Top
t	Set Temperature	Natural
e	Failure Code	0 - No failure, otherwise failure code same as in ls command
a	Ambient Temperature	Natural
h	Set Temperature	0.01º Precision
s	Louver Position	0 - No Louver Control a - auto (swing) h - horizontal 3 - 30º 4 - 45º 6 - 60º v - vertical

EXAMPLE

```
>query L1.100 o
1
OK
```

```
>query L1.100 m
0
OK
>query L1.100 t
25
OK
>query L1.100 a
27
OK
>query L1.100 f
2
OK
>query L1.100 e
U4
OK
>query L1.100 e
0
OK
>query L1.100 h
20.50
OK
```

swing

SYNOPSIS

swing <UID> <h|v|a|3|4|6>

DESCRIPTION

Set Indoor Unit(s) louver position to:

- h - horizontal
- v - vertical
- a - auto (swing)
- 3 - 30º
- 4 - 45º
- 6 - 60º

Not all Indoor Units support louver position options listed about or have louver position control at all. Louver control is capability of the specific Indoor Unit type. If requested louver position is not supported by Indoor Unit(s), **swing** command will have no effect.

EXAMPLE

Set Indoor Unit 102 on line L1 louver to horizontal position

```
>swing L1.102 h
OK
>
```

iset

SYNOPSIS

iset <UID> <SETN>
iset <UID> <SETN> <VAL>

DESCRIPTION

Read/Write Indoor Unit internal parameter (setting). If value not specified the parameter is read otherwise it is written with **<VAL>** and read back. Below is the list of the most useful settings.

<SETN>	Function	Mode	Value	Description
M1M2 (Mitsubishi Electric)				
02	Ambient Temperature	R/W	1	Average
			2	Indoor Unit return air sensor
			3	Wired Thermostat sensor
05	Auto Mode	R/W	1	Enabled
			2	Disabled
FUS (Fujitsu)				
42	Ambient Temperature	R/W	0	Indoor Unit sensor only
			1	Depends on setting 48
48	Ambient Temperature with Wired Thermostat	R/W	0	Indoor Unit and Wired Thermostat sensors
			1	Wired Thermostat sensor only

The complete up-to-date information about internal parameters and their values should be taken from related manual of the specific HVAC system and Indoor Unit type. Information in above table is provided only for reference.

COMPATIBILITY

M1M2	Yes
TAD	N.A.
FUS	Yes

feed

SYNOPSIS

feed <Ln> [±]<TEMP[.d]>

DESCRIPTION

This command defines CooLinkNet Own Ambient Temperature (as if it were measured by CooLinkNet itself). Command can work in relative or absolute manner. If plus '+' or minus '-' sign precedes **<TEMP>** parameter it's value will be added to or substituted from current value. Otherwise Own Ambient Temperature will be set to the given **<TEMP>** value. **<TEMP>** can be provided with 0.1 precision. If **<TEMP>** is zero CooLinkNet will not use Own Ambient Temperature for it's operation.
CooLinkNet keeps separate Own Ambient Temperature for each HVAC Line. If **<Ln>** is omitted the first not "Unused" HVAC Line will be taken.

Own Ambient Temp usage depends on HVAC Line type.

HVAC Line	Own Ambient Temp usage
M1M2	If non zero, sent to Indoor Unit as Wired Thermostat temperature sensor value
FUS	
TAD	Temperature sent to Indoor Unit in i-feel message

EXAMPLE

```
>feed 24.5 L2
OK
>
```

eco

SYNOPSIS

eco [UID]<0|1>

DESCRIPTION

Turns off - **0** or on - **1** ECO (economy) mode on Indoor Unit(s).

EXAMPLE

Turn on ECO mode on Indoor Unit 102 on line L2

```
>eco L2.102 1
OK
>
```

COMPATIBILITY

M1M2	N.A.
TAD	N.A.
FUS	Yes

6 ModBus RTU

CooLinkNet is fully compliant with following ModBus specifications:

- MODBUS over Serial Line Specification and Implementation Guide V1.02
- MODBUS application protocol specification V1.1b

ModBus Interface Physical Layer

CooLinkNet physical connection to ModBus is Two-Wire EIA/TIA-485 standard interface via 485-A and 485-B terminals, recommended by ModBus specification. On such 2W-bus, at any time only one driver has the right for transmitting thus a ModBus communication is always initiated by the master. CooLinkNet will never transmit without receiving a request from master. A number of CooLinkNet devices can be connected to single 2W-bus. Each CooLinkNet in this case must have unique ModBus slave address (command **line myID <Ln> <VAL>**).

ModBus RTU Frame Format

CooLinkNet by default supports ModBus RTU Transmission Mode with following frame format:

Baud Rate	9600
Start Bits	1
Data Bits	8
Parity	No
Stop Bits	1

Frame format can be changed with **line baud <Ln> <VAL>** command.

Supported MODBUS Functions

Function Code	Function Description
03 (0x03)	Read Holding Registers
06 (0x06)	Write Single Register
16 (0x10)	Write Multiple registers
43 14 (0x2B 0x0E)	Read Device Information

6.1 ModBus Address Map

Holding Reg Address*		Description	Read Write	Required**		Notes
Hex	Dec			Version	Model	
CooLinkNet Internals						
0001	1	CooLinkNet Version	R			
0002	2	CooLinkNet S/N	R			
0003	3	CooLinkNet Model	R			
0004	4	ModBus Address	R W			ModBus Address change is effective only after reset
0005	5	Reset	W			1 - Enter Boot mode CooLinkNet does not respond to the write request into this register 2 - Reset
0010	16	Internal State • 0 - Not Connected to RC line • 1 - Connecting • 2 - Connected as single RC • 3 - Connected as Master RC. Detected Slave RC • 4 - Connected as Slave RC	R			
0011	17	0 - Master Mode (default) 1 - Slave Mode	R W	0.0.4		
0012	18	UID	R			MSB - X, LSB - YY
Indoor Status and Control						
0100	256	On/Off 0-Off, 1-On	R W			
0101	257	Operation Mode (see Mode Encoding)	R W			
0102	258	Fan Speed (see Fan Speed Encoding)	R W			
0103	259	Set Point °C	R W			
0104	260	Failure Code	R			
0105	261	Indoor Ambient Temperature °C	R			MSB - Integer Part LSB - Fraction Part
0110	272	Feed Temperature °C	R W			

*On the ModBus wire registers address range starts from 0 and thus register address is sent decremented (-1).
** If Version or Model is not specified, it means that register is supported in any CooLinkNet version and/or model. N.A. means future option.

Mode Encoding

Cool	0
Heat	1
Auto	2
Dry	3
Haux	4
Fan	5

Fan Speed Encoding

Low	0
Medium	1
High	2
Auto	3
Top	4