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Quick Guide to CoolMasterNet for Air Conditioning Systems

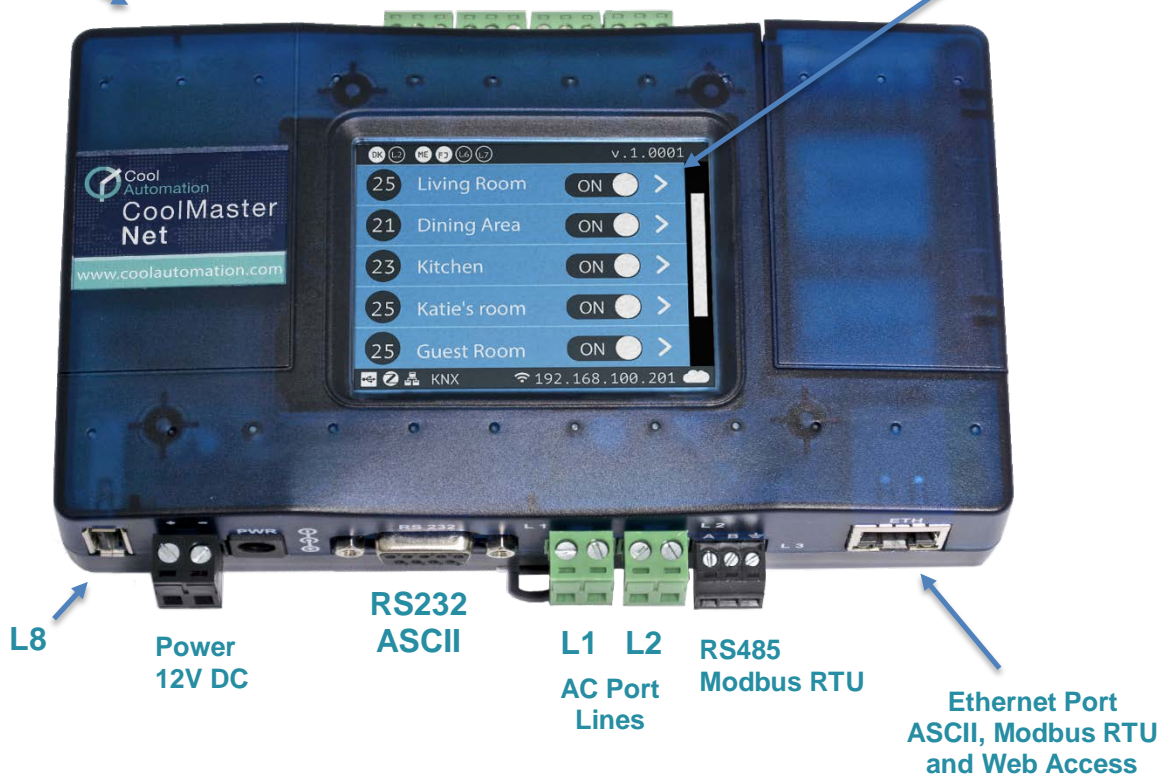
(CoolMasterNet - Interface Adapter for Air Conditioning Systems)

Mini USB

AC Port Lines

Touch Screen

L4 L5 L6 L7



Air Conditioning Communication Bus Lines:

L1 – L2: For Mitsubishi Electric, Daikin, Toshiba, Panasonic, Sanyo and Hitachi

L4 – L7: For Mitsubishi Heavy Industries, LG, Samsung, and Gree

L8 – USB Port for Echelon Stick - Fujitsu



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702

1. Air Conditioning Comms

The vast majority of leading Air Conditioning Manufacturers have incorporated in their Air Conditioning systems a specific, complex and advanced communication Bus line.

The Bus line is used for Intersystem communication between all the units in an Air Conditioning system, as well as for control via a centralised controller.

The above Bus line is normally present on all the VRF/VRV indoor and outdoor units.
As well, Some Split Air Conditioning Units are equipped with a Bus line for central control communication.
On split Air Conditioning units where the Bus line it is not present by default, Air Conditioning manufacturers offer an optional PCB with Bus line capabilities

Most Air Conditioning Manufacturers have a name for their Bus line:

**Table 1:
Bus Line Names**

Manufacturer	Bus Name
Daikin	DIII Net
Sanyo	S Net
Panasonic	P Net
Toshiba	TCC Link
Mitsubishi Electric	M Net
LG	PI485
Mitsubishi Heavy Industries	Super Link / Super Link II
Hitachi	H Link
Samsung	Nasa Protocol
Fujitsu	VRF Communication Line



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107

2. CoolMasterNet

CoolMasterNet is a plug and play interface that allows exchange of data between Air Conditioning Systems and Home Automation / BMS Systems.

CoolMasterNet acts as a two-way translator between the Air Conditioning Bus line and Home Automation or BMS over RS232 (ASCII), RS485 (ModBus RTU) or ASCII/Modbus over IP (KNX as an extra option).

Once connected, CoolMasterNet allows the Automation system to monitor and control individually all Air Conditioning Indoor units on the Bus line.

Some of the control options are (subject to manufacturer's limitation for some units):

- On/Off
- Mode (Cool, Heat, Auto, Fan)
- Fan Speed
- Temperature set point
- Room Temp feedback
- Fault Code and more...

Each Air Conditioning manufacturer has a limit on how many indoor fan coil units can be connected to one central control Bus line port. Table 2 shows the maximum number of indoor units connectable to a single Port line on the CoolMasterNet.

It is possible to activate more than one AC Port Line on the CoolMasterNet for a site with multiple manufacturers or a large site with many units (Extra Option)

Table 2:

Maximum number of indoor units per line on the CoolMasterNet (Subject to Limitations)

Manufacturer	Maximum Units	Compatible Port Lines on the CoolMasterNet
Daikin	64	L1 - L2
Sanyo	64	L1 - L2
Panasonic	64	L1 - L2
Toshiba	64	L1 - L2
Mitsubishi Electric	50	L1 - L2
LG	128	L4 - L7
Mitsubishi Heavy Industries	128	L4 - L7
Hitachi	64	L1 - L2
Samsung	64	L4 - L7
Gree	16	L4 - L7
Fujitsu	64	L8



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703

3. Home Automation Drivers

On the Automation side of the CoolMasterNet (ASCII), the protocol is similar for all CoolMasterNet Lines/AC Manufacturers. Therefore, one Driver Module will work for all CoolMasterNet Lines/AC Manufacturers.

To facilitate evermore the work with CoolMasterNet, the market leading Home Automation manufacturers have created Driver Modules for CoolMasterNet that can be loaded on their processors by integrators (Table 3).

For bespoke features, Automation Engineers can write and load their own driver.

The ASCII commands and Modbus registers can be found on our CoolMasterNet PRM (www.coolmasternet.co.uk).

In Principle, the Drivers for CoolMaster should work on CoolMasterNet if only one Port Line is in use. Otherwise use only the CoolMasterNet Driver.

Table 3:
Home Automation Drivers

Manufacturer	Maximum Units
Control4	Download drivers from Extra Vegetables
Crestron	Drivers can be found in Crestron drivers database
Lutron	Drivers can be found in Lutron drivers database
AMX	Drivers can be found in AMX drivers database
HAI	Drivers can be found in HAI drivers database
RTI	Drivers can be found in RTI drivers database
ELAN	Drivers are available from manufacturer's database
Push Controls	Drivers are available from manufacturer's database
Vantage	Drivers can be found in Vantage drivers database
Savant	Drivers can be found in Savant drivers database
Ness	Drivers can be found in Ness drivers database
Smart HDL	Drivers can be found in Smart HDL drivers database
TeleTask	Contact TeleTask for details
KNX	Can be used with CD Innovation products
CUE	Contact manufacturer for driver details/options
Phillips Dynalite	Contact manufacturer for driver details/options
Bticino - My home	Contact manufacturer for driver details/options
Unitronics	Contact manufacturer for driver details/options
LiteTouch	Contact manufacturer for driver details/options
Beckhoff	Contact manufacturer for driver details/options
Waga	Contact manufacturer for driver details/options
Domintell	Contact manufacturer for driver details/options
DemoPad	Contact manufacturer for driver details/options
BitWise	Contact manufacturer for driver details/options

and many others...



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4. Sample of ASCII Commands

help	- Print Help message
set	- set [<setting> <value>] Get/[Set] Setting
boot	- Enter BOOT mode
allon	- Turn ON All Indoors
alloff	- Turn OFF All Indoors
simul	- Simulate Indoor(s): simul [LN] <num>
on	- Turn ON Indoor(s)
off	- Turn OFF Indoor(s)
cool	- Indoor(s) Cool Mode
heat	- Indoor(s) Cool Mode
fan	- Indoor(s) Fan Mode
dry	- Indoor(s) Dry Mode
auto	- Indoor(s) Auto Mode
temp	- Change set point
fspeed	- Change fan speed
vam	- vam <UID> <a b x n L h H s t A>
filt	- Filter sign reset
swing	- Change swing
stat	- Indoor(s) Status
ls	- Indoor(s) Status
query	- query <UID> <o m f t e a h>
lock	- lock <UID> [<+ ->[o m t]...]
wh	- Water Heater change mode: wh <UID> <h e w a>
group	- Group Indoors: group [<UID> <UID> delall -n]
xtr	- xtr [c] [Clear]/Dump XTRACE
i2c	- i2c <hex_sla>[.<[00+]hex_ma>] <sz> [HH+] scan
ifconfig	- Configure ETH
lcd	- lcd T <x> <y> <str> Test Write on LCD
line	- HVAC Lines Status/Control
extio	- ExtIO Status/Control
info	- Board Status
knx	- Configure KNX



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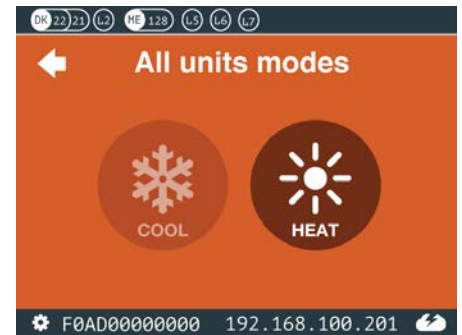
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5. Central Control

The CoolMasterNet is equipped with a Touch Screen which also allows direct control of each indoor AC unit/group individually (subject to limitations).

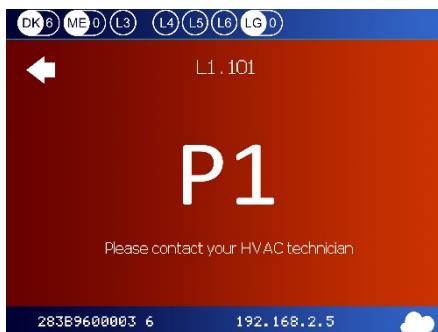
Control on the Touch Screen:

- On/Off (Collective)
- On/Off (individual)
- Temp set point (individual)
- Mode Selection (Collective)
- Fan Speed Selection (individual)
- Fault Code Display (individual)



6. Remote Login

Integrators can login the CoolMasterNet remotely using our CoolRemote web app. This will allow them to view the system Status and Error Codes (where available). As well as basic unit control such as: On/Off (Collective), On/Off (individual), Temperature set point, Mode Selection, Fan Speed Selection.



7. Moving ahead

We recommend that you email us at controls@tenways.co.uk the complete Air Conditioning unit list for each project so we can advise compatibility and installation instructions, if requested.

