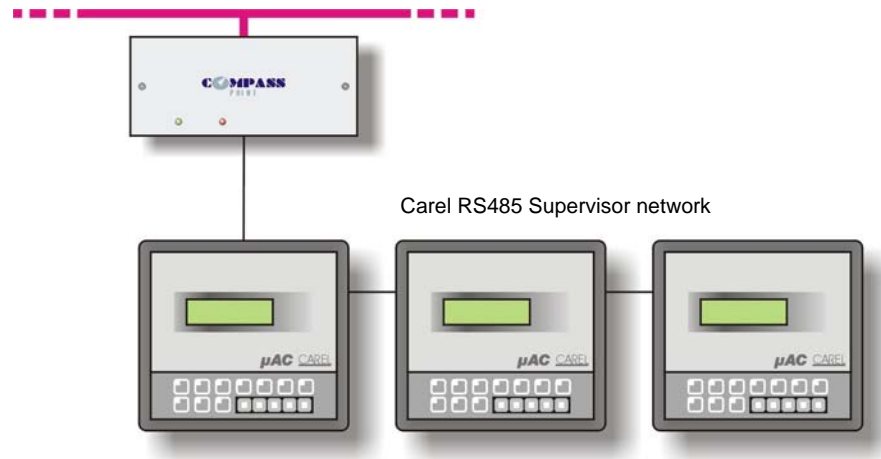# Product Engineering Guide
Compass v22 Carel v20 MRTC485

Introduction

The Carel Compass Point links the range of Carel air-conditioning and refrigeration packaged controls to the Compass Network. The Compass Point connects to a network of up to 31 Carel controllers fitted with an RS485 serial card.

Carel RS485 Supervisor network

Supported Range

Carel OEM controls are badged by various air-conditioning and refrigeration manufacturers, including Airedale, Climaveneta, Klima-Therm, McQuay, RC Group, Trane, Uniflair, York, and many others. Each version of controller is fitted with application firmware tailored to the final product. Values in the controller are accessed as a list of analogue, integer and digital values. To understand the list you will require a description of these values from the manufacturer.

The driver is compatible with the following units when fitted with the **RS485** interface card.
- pCO, pCO^1, mP20
- pCO^2
- µAC/FCM, microAC

The driver is also compatible with the following units with additional hardware.
- ASM2, mP3/hP3 – this requires an additional RS485 to RS422 converter
- µChiller – requires a Carel ISA72 interface card and an additional RS485 to RS232/RS422 converter.

The Compass Point can generally access the following from each unit:
- Remote start and stop of the unit;
- Reading and setpoint adjustment of regulation and alarm parameters;
- Acquisition of the output status;
- Reading of temperature and humidity measured by the sensor of the unit;
- Acquisition of the alarm status.

Notes

The Carel system does not report alarms to Compass. If alarms are needed then an alarm generation device, such as AlarmGen, will be required. For more information, search the North Helper application for 'Alarm'.

The Carel system does not provide logging facilities to Compass. If logging of values is needed then a LogMax device will be required. For more information, search the North Helper application for 'Log'.

Engineering

Step 1 – Mount the Compass Point

Refer to the 'Mounting' section within the 'MRTC485 Compass Point Hardware' document for details on how to mount the Compass Point securely to a wall or within a cabinet.

Step 2 – Configure Carel System

The Carel units can be networked using the RS485 Supervisor network, to which the Compass Point is connected. Please note the pLAN network is used for communication between controllers only.

The terms used in this section may vary between manufacturer versions. The unit address should be unique on the supervisor network. A baud rate of 19200 is recommended.

μAC

Fit the RS485 serial card (ref. MAC2SER000) to the μAC display unit.

From the μAC display, access the user parameters by pressing the 'Alarm' key for 5 seconds. Enter the user password and configure the following parameters:

Parameter	Description	Value
Ho	Address of μAC on supervisor network	1…200
HP	Baud rate of supervisor network	1=1200, 2=2400, 3=4800, 4=9600, 5=19200

pCO

Fit the RS485 serial card (ref. PCO1004850 or PCOSER0000) to the 9-pin connector J7 on the pCO card. If applicable, set the jumper to RS485 communication.

From the display, access the service menu and configure the following parameters:

Menu	Parameter	Value
Remote Control	I/O via Serial	Yes,No
	Id #	1…16
	Speed	1200, 2400, 4800, 9600, 19200

pCO^2

Fit the RS485 serial card (ref. PCO2004850) to the serial card expansion slot in the pCO^2 unit.

From the display, access the user parameters by pressing the 'Prog' key. Enter the user password and configure the following parameters on page Pf:

Parameter	Value
Identific. number for BMS	1…200
Comm. Speed	1200, 2400, 4800, 9600, 19200
Protocol type	Carel

From the manufacturers parameters (accessed by pressing 'Menu' and 'Prog') the following parameter can also be set to allow control from the Compass Point:

Menu	Parameter	Value
Configuration	BMS Network	Yes,No

ASM2

Carel ASM2 cards are networked using RS422 and will require a powered RS485/RS422 converter connected to the Compass Point at one end, and a closing (Carel ref: 98C145C025) at the other. The ASM2's are then connected between via a T connector (Carel ref: 98C145C019).

For each of the ASM2's connected to the Carel RS422 network, configure its address using the 4-way DIP-switch SW1. The address should be unique on the network in the range 1 to 15.

Step 3 – Connect Compass Point to Carel System

Connect the Carel supervisor network cable to the RS485 terminal block of the Compass Point. Refer to the section '*Cable*' below for details of the cable.

Step 4 – Apply Power to the Compass Point

Refer to the 'Power' section within the '*Compass Point MRTC485*' document. Once power is applied, the green LED should be lit continuously to show that the Compass Point is working correctly on the Compass Network.

Step 5 – Configure the Carel driver within Compass Point

The baud rate, device number, direct connect, and maximum address on the supervisor network are configured using objects. Use object engineering software, such as ObView, to view and modify the objects within the Compass Point.

Step 6 – Access Objects within the Carel System

The driver scans the Carel supervisor network for available units. The driver then polls the attached units for their values and stores these within the Compass Point. The red LED near the RS485 port of the Compass pulses when a valid message is transmitted or received by the Compass Point.

Values from the Carel system are made available as objects on the Compass Network. Any object software that is connected to the Compass Network can access these objects.
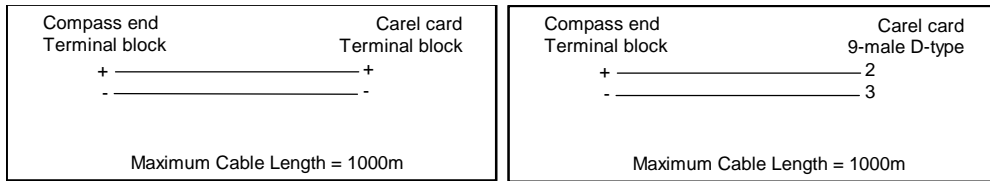
Step 7 – Configure the Transfers within the Compass Point

Compass Point transfers are also configured using objects. Refer to the 'Transfers' section within the 'Compass Point Overview' document for more details.

Engineering Reference

Cable Specification

The cable between the Compass Point and the Carel RS485 serial card as follows:

```
Compass end                Carel card          Compass end                Carel card
Terminal block        Terminal block           Terminal block       9-male D-type

    + ————————————— +                              + ————————————— 2
    - ————————————— -                              - ————————————— 3


    Maximum Cable Length = 1000m                    Maximum Cable Length = 1000m
```

Objects

When the Compass Point is powered-up the following objects are created on the Compass Network, use object software to access these objects.

Object	Label	R/W	Type
D*n* [1]	Carel System	-	Carel [2]
P*p* [3]	Carel Compass Point	-	*[Compass v22\Carel v20]*

Notes

[1]   The Device Number, *n*, is a number in the range 0…63.

[2]   This object has a variable content and as such requires scanning. If a network of controllers is attached the object has the type *[Carel v20]*
        If a single unit is attached with the 'direct connect' option set, the object has the type *[Carel v20\Unit]*. If the controller is a fixed-function μAC
        the object has the type *[Carel v20\MicoAC]*.

[3]   If the Compass Point has its device number configured the Point address, *p*, is a number in the range 1…63. If no device number is set the Point
        address, *p*, is the Compass Point serial number in the range 1000000…99999999

Notes

Revision History

Version	Build Date	Details
1.0	6/7/98	Released
1.0	29/3/99	Mod: Update 'Comms Status' timer when 'no values changes' message received. Driver reports communications fault.
2.0	1/03/03	Major driver redesign implementing all current Carel protocol versions up to 3.0s