Guide to the GOLD version E/F functions, SMART Link DX

1. General

The *SMART Link DX* function is designed for controlling the supply air temperature via interconnection of one GOLD air handling unit with rotary heat exchanger (GOLD RX) and one to four Celest+ chillers/heat pumps.

The function includes the type TCCC air heater/cooler, which can be used for up to 3 Celest+ units as standard (A special air heater/cooler is required if 4 Celest+ units are installed).

1.1 Installation

All the necessary control functions are ready to be activated. On selecting the type of unit, the control system automatically activates the extra regulation sequence. No IQlogic+ module is required.

For particulars of the Modbus ID of each unit: See the diagrammatic sketch below.

See also the separate installation instructions for the GOLD and Celest+ respectively.

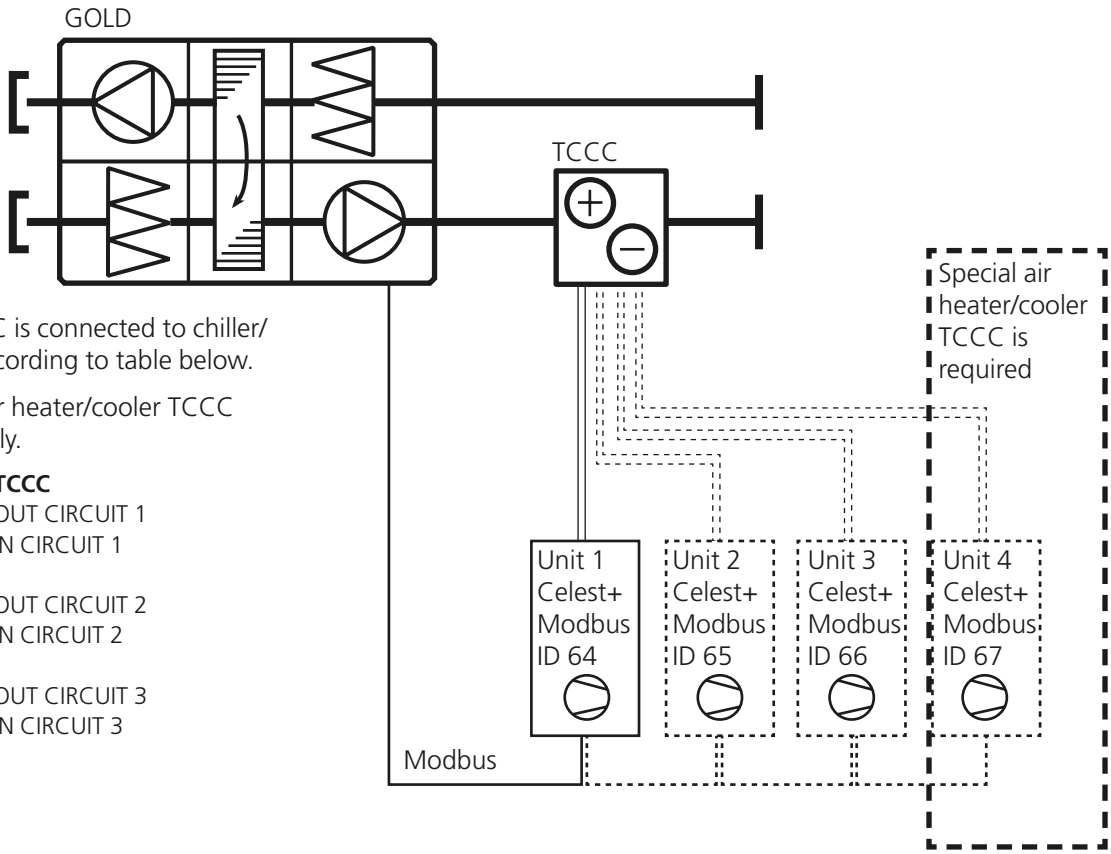
2. Material Specification

Air handling unit	**GOLD RX**
Chiller/Heat pump (1-4 units)	**Celest+ /LE or /LE/HP**
Air heater/cooler	**TCCC**

(A special air heater/cooler is required if 4 Celest+ units are installed.)

Cable adapter	**TBLZ-1-64**

1.2 Diagrammatic sketch



Air heater/cooler TCCC is connected to chiller/heat pump Celest+ according to table below.

Also see labeling on air heater/cooler TCCC and Celest+ respectively.

Celest+ unit 1	**TCCC**
IN	OUT CIRCUIT 1
OUT	IN CIRCUIT 1
Celest+ unit 2	
IN	OUT CIRCUIT 2
OUT	IN CIRCUIT 2
Celest+ unit 3	
IN	OUT CIRCUIT 3
OUT	IN CIRCUIT 3

3. Function

3.1 General

Operation is performed according to the GOLD unit's extra regulation sequence function. See the Operation and Maintenance Instructions for the GOLD.

The speed of rotation of the Celest+ unit is 0-100% controlled between min. and max.speed of rotation. The min. speed is about 15-20 % of the max speed.

A dead band can be set that prevents starting at very low capacities, irrespective of the demand from an extra regulation sequence. The Celest+ unit is then not permitted to start until the supply air temperature (in the cool case) exceeds or (in the heat case) is below the set point by the set value for the dead band (factory setting 0 K, can be set 0-5 K).

When several Celest+ units are used, the ones that are active are always run in parallel (same speed of rotation).

For a system with more than one Celest+ unit, the Celest+ unit with the lowest total operating time is always started first.

If the GOLD unit is shut down, it is run in an overtime operating sequence (afterrun) for 2 minutes with the Celest+ units switched-off.

When an alarm (even a communication alarm) is initiated by a Celest+ unit, this unit is switched off and a new Celest+ unit is started, provided that one is available.

The supply air temperature is likely to drop during the defrost cycle. An air heater for reheating (TBLA/TCLA/TBLE/TCLE) can then be used for heating the supply air temperature to ensure comfort.

3.2 Limitations

The dehumidification function does not work for a system with ordinary cooling in sequence, with combined air cooler/air heater, connected to a Celest+ reversible unit.

Only GOLD air handling units with type RX (rotary heat exchanger) can be used with the SMART Link DX system function.

3.3 Active units

Increasing and decreasing the number of active units takes place according to preset values in the Celest+ control system. These values are always read in Unit 1 (ID 64), if no communication alarm has tripped. If a communication alarm trips, the values in Unit 2 (ID 65) are used, etc. The control system of the GOLD unit uses the same limits for all the Celest+ units, irrespective of whether they are set differently.

Both the heat/cool demand and the actual speed of rotation of all the active Celest+ units are required to be within the limits that enable an increase or decrease in the number of active units.

During every change in the number of active units, the control system freezes the number of active units for 4 minutes (factory setting, resettable). The reason for this is to stabilize the regulation function before a new decision to change the number of units can be made.

During this delay, the rotary heat exchanger is permitted to regulate down or up (depending on the heat/cool capability across the heat exchanger) in order to compensate possible differences in supply air temperature.

This delay also applies if you switch to 0 active units, which means that the shortest time in stopped mode during switching between cool and heat for reversible Celest+ units is 4 minutes (factory setting, resettable).

3.4 Operating modes

Available operating modes:

0. STOP
1. STANDARD OPERATION
2. STABILIZING
3. COMFORT
4. DEFROST DELAY
5. DEFROSTING
6. OIL RECOVERY
7. AFTERRUN

3.4.1 STOP
Occurs when the GOLD unit has stopped.

3.4.2 STANDARD OPERATION
Denotes ordinary operation. In the STARDARD OPERATION mode only, the number of active units can be changed irrespective of the cool or heat demand.

3.4.3 STABILIZING
When the number of active units is changed, the control system freezes the number active units for 4 minutes (factory setting, resettable) so that the regulation function will stabilize. (For a more in-depth description, see Section 3.3.)

3.4.4 COMFORT
When little capacity is needed (one active unit operating at min. speed), the system locks in a so-called comfort mode for 30 minutes (factory setting, resettable).

During this period the number of active units is locked to 1 and the rotary heat exchanger is permitted, if possible, to compensate for possible excess heat or cooling. This means that if the capacity demand rapidly decreases, a period in the comfort mode will still have to run its course. The only way to leave the comfort mode faster is to stop and restart the air handling unit.

The length of the period in the comfort mode can be set down to 0 minutes. (However, a changed length of period will not be valid until the system is no longer in the comfort mode.)

3.4.5 DEFROST DELAY
If defrost is required in a Celest+ unit operating in the heat mode, a delay of 180 seconds (factory setting, resettable) must elapse before the defrost cycle starts. If the need for defrost disappears some time during this delay, the defrost cycle is cancelled.

When the defrost delay begins, one more Celest+ unit will immediately start, provided that one is available.

3.4.6 DEFROSTING
The defrost cycle takes a maximum of 7 minutes (excluding the defrost delay) and it never occurs in more than one Celest+ unit at a time.

3.4.7 OIL RECOVERY
During longer periods of operation at low speeds of rotation, there is risk of insufficient oil circulation in the Celest+ circuit. The unit and the system are then put in the OIL RECOVERY operating mode, i.e. the Celest+ unit increases its speed to 75% (of the maximum speed of rotation) for 4 minutes. The GOLD unit then permits the rotary heat exchanger to regulate down or up. Following operation in the OIL RECOVERY mode, the unit will stabilize for 4 minutes (factory setting, resettable).

3.4.8 AFTERRUN
On an order to shut down, the GOLD unit will run in an overtime operating sequence (afterrun) for 2 minutes with the Celest+ unit(s) switched off.

4. Electrical connections.

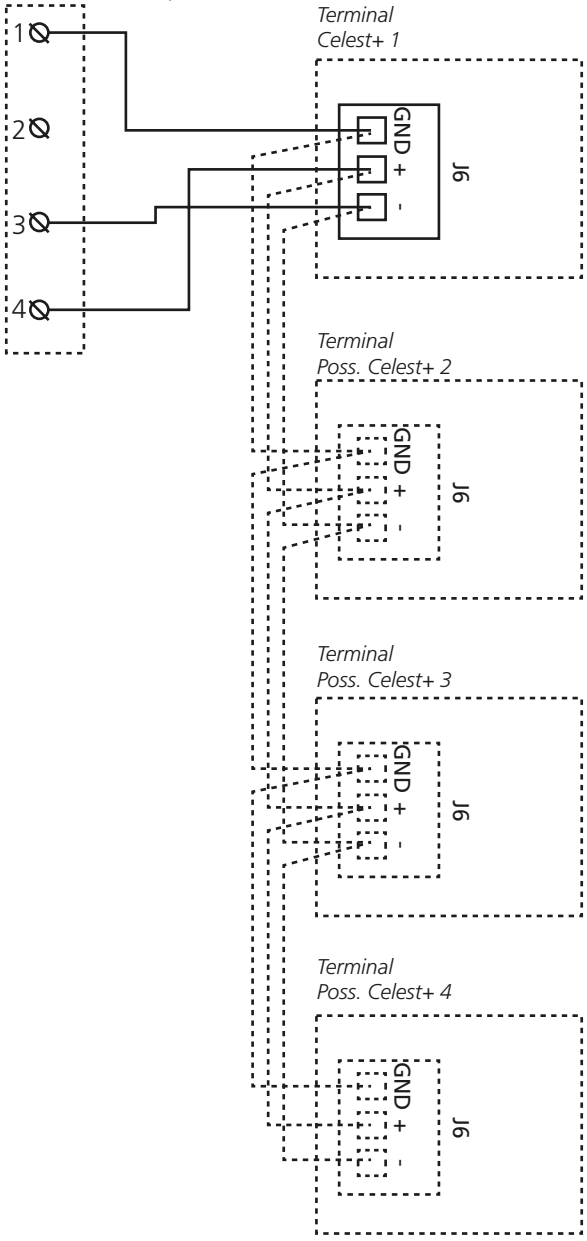
4.1 SMART Link

Connect the bus cable (supplied) between the bus contact, marked COM4, on the control unit of the GOLD unit and an optional bus contact on the cable adapter.

Connect the communication cable between the Celest+ control equipment and the TBLZ-64 cable adapter as illustrated below.

The cable is not included in the supply. A 0.5 mm², twisted-pair cable is recommended. Max. permissible cable length: 100 metres.

Wiring terminals for the TBLZ-64 cable adapter



5. Settings

For basic facts on how to use the hand-held terminal, see the Operation and Maintenance Instructions for the GOLD Air Handling Unit.

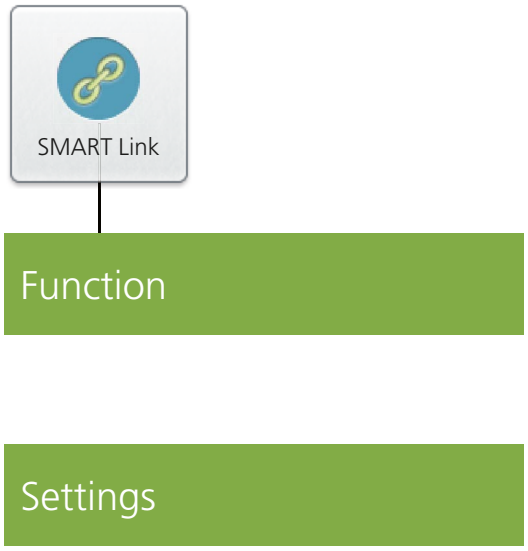
The chiller/heat pump functions must be manually activated under Functions/SMART Link.

Set the supplied type of Celest+ (DX, heat pump/ DX, chiller or DX, reversible).

Set the number of connected units (Celest+) which the GOLD air handling unit will control.

Set the required length of the period for operation in the comfort mode, defrost delay, dead band and the time for stabilization.

Extra regulation sequence for heat and cool resp. is activated automatically.



6. Status

The chiller/heat pump readings can be viewed under Status.

No values can be changed in this menu group.

7. Manual test

The relevant values can be viewed and controlled under INSTALLATION – MANUAL TEST - SMART Link.