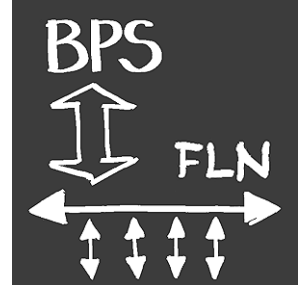


VISONIK®

BPS communication with TEC™

Function sheet

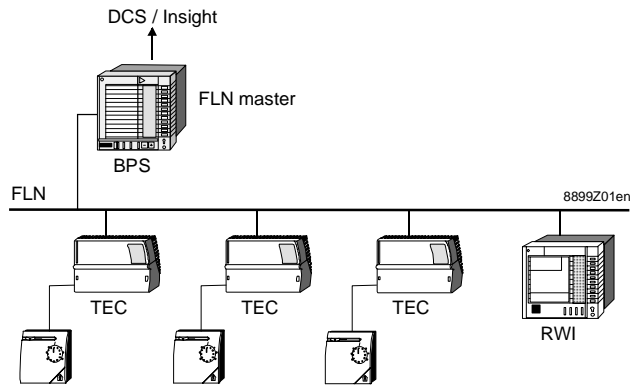


Terminal equipment controllers—short TEC—are communicative individual room controllers. They can be linked to form a system via the floor level network (FLN). If a VISONIK system is used for higher room management, the building process station (BPS) server as the communication master (FLN master). AEROGYR ventilation controllers RWI can be integrated in addition to TEC devices.

Use

Topology

The TECs control and supervise the temperature or humidity of individual rooms. The RWI controllers help control ventilation plants. Both device families can communicate with the BPS via FLN (equipped with COM2 communication card). The BPS as the FLN master coordinates the individual devices and integrates them in the higher management station.



Commissioning the FLN master

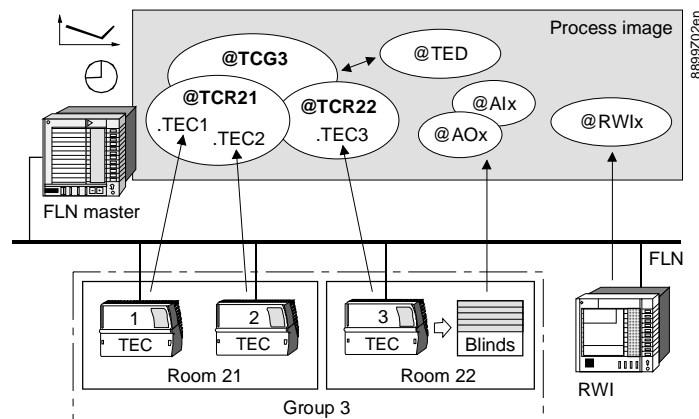
The FLN master carries out the following tasks in addition to controlling and supervising communication on the floor level network:

Task	Examples
Provide information for users	Operating mode, setpoints for heating and cooling, present room temperature, etc..
Coordinate TECs	Form TEC rooms and groups, calculate, transmit operating values, etc..
Support RWI	RWI data points, higher functions.
Allow for service action	Enabling, valve purge, etc..

Integration

Principle

During engineering, the devices on the floor level network are defined as data points in the FLN master's process image:



Point types and information

The following point types are available to image the FLN devices to the FLN master. They contain the following information:

Point types	Information
TEC rooms @TCR	TEC rooms (@TCR) comprise 1 to max. 10 TEC controllers (TEC1, TEC2, etc.) according to their arrangement in the building. TEC rooms contain information such as: <ul style="list-style-type: none"> – The most important actual values of the room. – Defaults from the higher group. – FLN addresses of the allocated TEC, etc.. Comment: Master-slave principle if more than 1 controller in room.
TEC groups @TCG	TEC groups (@TCG) comprise 1 to max. 20 TEC rooms according to the climatic/technical zones or occupancy profiles. TEC groups contain information such as: <ul style="list-style-type: none"> – Operating mode (Comfort, Comfort Reduced, Economy, Standby) and setpoints. – Setpoint correction according to outside air temperature. – Minimum, maximum, median values for room temperatures, etc..
Energy demand @TED	The energy demand points (@TED) in the FLN master gather the energy demand of individual TECs and forward the demand. <ul style="list-style-type: none"> – Up to 30 TECs featuring the same type of energy (e.g. hot water, chilled air, etc.) are grouped in one TED. – Calculation of minimum, median, and maximum value by TED.
Link points @AO / @Al	I/O points not used by the TEC application can, for example, be used for blinds or main light switches, and be integrated as link points (@AOx or @Alx).
RWI points @RWI	RWI points each image an AEROGYR device (@RWIx) and contain information such as the operating mode, setpoints, actual values, fault messages, manipulated variables, etc..

FLN master functions

Via the integrated data points, the FLN master executes the central control and coordination tasks for the FLN devices as programmed:

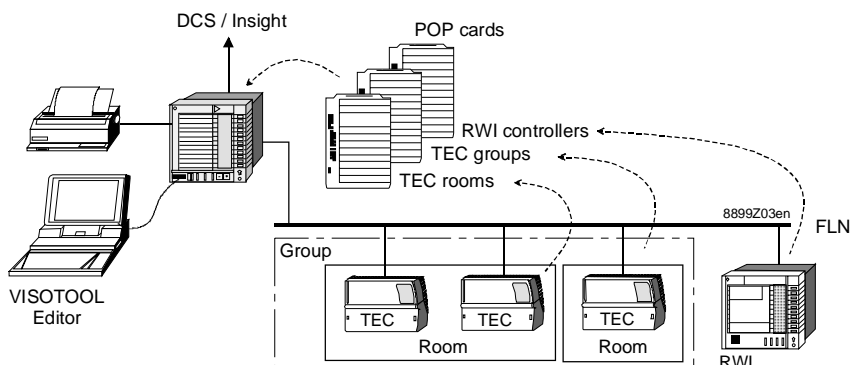
- Coordination of TEC and RWI with respect to scheduler programs, operating modes, and setpoints.
- Coordination of central air and energy handling, and of the supervision and protection functions.
- Special functions for room management: Night ventilation, smoke extraction, etc..
- Demand-controlled ventilation: Room air quality, pressure control (VAV).

Operation

Options

The controllers integrated as data points can be operated via:

- POP cards (standard cards / project cards).
- PC with VISOTOOL Editor.
- Insight station on the DCS.



What can I operate?

Operation accesses the following data points and parameters (examples):

Data points	Parameter for ...
TEC groups	<ul style="list-style-type: none"> – Default operating modes: Comfort, Economy, etc.. – Setpoint defaults for heating/cooling in the operating modes. – Reading of calculated values. For instance, portion of Comfort (%), median value of room temperatures, etc.
TEC rooms	<ul style="list-style-type: none"> – Default operating modes: Comfort, Economy, etc.. – Associated setpoint defaults for heating/cooling. – Reading of current room temperature values. – Reading of current values for output signals to the actuating devices.
Link points	<ul style="list-style-type: none"> – Query point status, command output (blinds up/down, etc.).
RWI controller	<ul style="list-style-type: none"> – Operating mode defaults and setpoints for heating/cooling. – Reading of current values for inputs and outputs.

RMR reports

The room management report RMR (VISOTOOL Editor) displays or prints information on groups, rooms, and controllers of the individual room control system on the screen or printer. The following examples show the beginning of a room management report for all TEC rooms TCR. The following are shown:

\$d007' TCR22, i.e., room TCR22 at BPS 007 with TEC controllers (T33..34).

```

RMR          08:23:54          R E P O R T - S T A R T          18-JAN-2001/TH

TCR $d007'TCR22 (T33..34)
      18-JAN-2001 18:32:35 AOPST=Comfort RRTP=20.3 ERSTA=0
SOPST=Economy          APRST=Fully occupied
SOMOD=Local            ASTH =1                VSPA =0 m3/h
MACT =0                ASTC =0                VEXA =0 m3/h
MOPST=Economy          RRSC =3 °C                RWINO=Close
+-----+-----+-----+-----+-----+-----+-----+-----+
! TEC ! ARTP ! OHWA ! OCWA ! OXWA ! OHAIR!OCAIR!OHHB !OEAIR ! OFAN !AIRVS1!AIRVE !
!      !      !OHWA2!OCWA2!      !      !      !      !      !AIRVS2!      !
!      ! [C] ! [%] ! [%] ! [%] ! [%] ! [%] ! [%] ! [%] ! [m3/h] ! [m3/h] ! [m3/h] !
+-----+-----+-----+-----+-----+-----+-----+-----+
! 33 ! 20.3 ! 0 ! 0 ! 0 ! 0 ! 35 ! 0 ! 35 ! 0 ! 0 ! 0 !
!      !      ! 57 ! 0 !      !      !      !      !      !      ! 0 !      !
+-----+-----+-----+-----+-----+-----+-----+

```

The report shows the values e.g. for the following parameters:

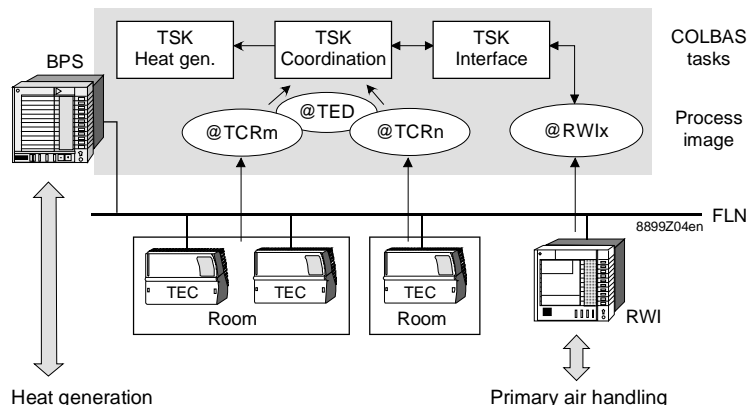
- Present operating mode of the controller AOPST = Comfort.
- Present room temperature ARTP = 20.3 °C.

For the other parameters, refer to the "BPS process image" document, volume 2.

Coordination to HVAC main station

Example

The following illustration shows a simplified example for coordination of central energy handling with secondary plant demand (TEC) via the BPS. Heat generation and primary air handling are coordinated:



Functions

These elements and functions are involved in coordination:

Element	Functions
BPS	<p>Special COLBAS tasks (TSK) are involved in addition to the master functions for TEC described above:</p> <ul style="list-style-type: none"> – Task "Coordination" gathers the TEC's process values, evaluates them, and sends commands to its own "Heat generation" task as well as to the RWI via the "Interface" task. – The "Heat generation" task is a DDC program to control central heat generation, which is connected to the BPS via the P-bus and the P-bus modules.
RWI	The RWI ventilation controller controls primary air handling.
TEC	<p>The TEC devices and data points provide key information:</p> <ul style="list-style-type: none"> – The TEC rooms contain detailed information on the supply air and extract air volumes for the room and for each TEC controller as well as the fan speeds for each TEC controller. – The TEC groups contain the present operating conditions: (For reasons of clarity, the groups are not shown in the illustration). – The TED points indicate the specific energy demand of the associated TEC controllers.

Possible process

For the above example, the following process where the TEC energy demand values control heat generation is a feasible scenario:

1. The rooms are too cold: The room temperatures are below the setpoint.
2. The heating valves in the cold rooms are opened more than 80%, without effect.
⇒ The flow temperature must be increased.
3. The BPS supervises the states and conditions. It determines the energy demand in the TED point and sends a command to increase the flow temperature setpoint to the "Heat generation" task.

Additional information

Refer to the following documents for more information on this topic:

Document No.	Title
CM2T8567E	VISONIK system basics, topic 16 "TEC points in the BPS".
CM2Z8303E	BPS process image, volume 2.