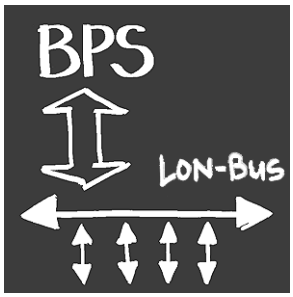
VISONIK®

BPS communication with DESIGO™ RX

Function sheet

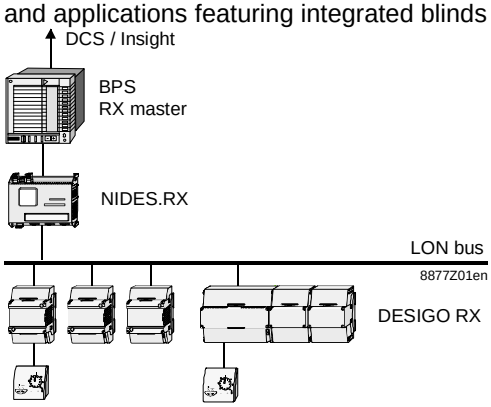


DESIGO RX is a communicative individual room control system for HVAC applications with integrated control for blinds and lighting. Communication takes place via the LON bus (LonMark standard). If a VISONIK system is used for higher room management, the building process station (BPS) server as the communication master (RX master).

Use

Topology / RX applications

The DESIGO RX controllers on the LON bus are connected to the BPS as RX master and to the VISONIK data and communication server (DCS) via the NIDES.RX interface. The application software loaded determines the RX controller's functionality. There are applications for fan coil and VAV systems, for heating/chilled ceilings and radiators, and applications featuring integrated blinds and lighting control.



LON bus

LON stands for local operating network, a global field bus defined by the LonMark® standard.

RX master functions

The RX master functions in the BPS either directly or indirectly allow for the following higher functions:

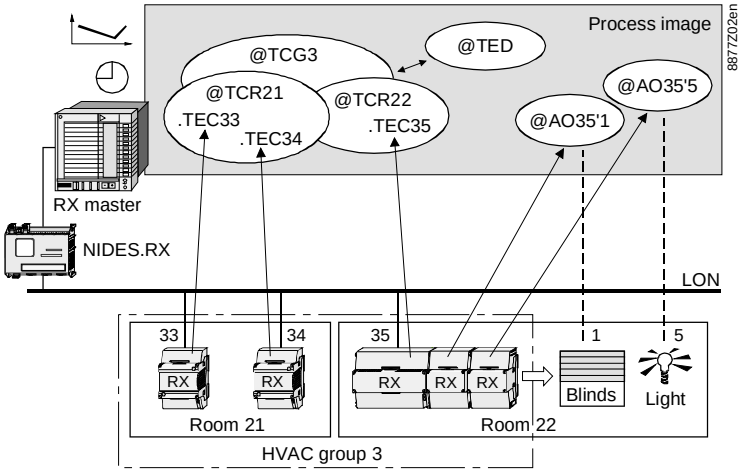
- Coordination or control functions on the automation level (VISONIK BPS).
- Management functions on the management level (DESIGO INSIGHT or VISONIK Insight).

The detailed functionality depends on the respective RX application and the number of controllers integrated per RX master as well as on the level of integration of both automation station or management station requested by the customer.

Integration

Principle

To integrate DESIGO RX in VISONIK, the RX controllers are defined during engineering as VISONIK data points in the process image of the RX master as:
– HVAC rooms and groups
– Blinds groups
– Lighting groups



During operation, the RX controllers and the RX master continuously exchange the latest information via the NIDES.RX interface.

Point types and information

The RX controllers are mapped in the RX master via special data points, similar to those used to integrate the TEC individual room controllers in the BPS:

Point types	Information
@TCR TEC rooms	TEC rooms comprise 1 to max. 10 RX controllers (master – slave principle) according to their arrangement in the building. TEC rooms contain information such as: – The most important actual values of the room. – Defaults from the higher group. – Addresses of the allocated RX controllers, etc..
@TCG TEC groups (HVAC)	TEC groups comprise several TEC rooms according to the climatic/technical zones or occupancy profiles. TEC groups contain information such as: – Operating mode (Comfort, Comfort Reduced, Economy, Standby) and setpoints. – Setpoint correction according to outside air temperature. – Minimum, maximum, median values for room temperatures, etc..
@TED Energy demand	The energy demand points in the RX master gather the energy demand of individual controllers and forward the demands. – Up to 30 RX controllers 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.
@AO / @AI Blinds and lighting groups	The DESIGO RX modular devices enable blinds and lighting group control. Integration occurs via link points (@AO / @AI). The groups are formed as the basic elements by means of the basic RX controller. The lighting or blinds portion of the RX controller can be assigned to several lighting or blinds groups at the same time.

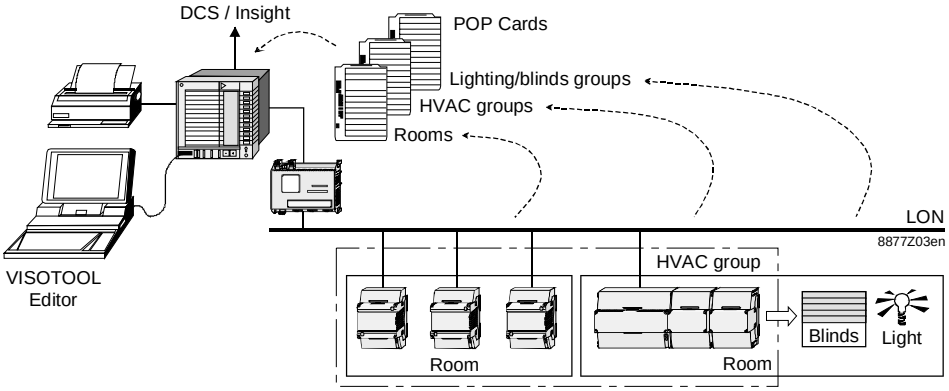
System capacity

Max. 30 to 80 applications or RX controllers can be integrated for each RX master / NIDES (max. 30 for complicated, integrated applications with lighting and blinds control, max. 80 for simple radiator applications).

Options

The controllers integrated as data points can be operated via:

- PC with VISOTOOL Editor.
- Insight station on the DCS: Pictures created for each project.
- POP cards: Standard cards or cards created for each project.



What can I operate?

Operation as a rule accesses all data points integrated in the RX application. The exact scope and operation depend on the project-specific implementation and the respective operator unit. Examples:

Elements	Operating scope (examples)
HVAC groups	– Default operating modes: Comfort, Reduced, Economy, etc.. – Setpoint defaults for heating/cooling. – Reading of calculated values. For instance, number of rooms with Comfort or Economy operation, median value of room temperatures, etc.
Rooms	– Default operating modes: Comfort, Reduced, Economy, etc.. – Setpoint defaults for heating/cooling. – Reading of current room temperature.
Blinds and lighting groups	– State query for lighting and blinds groups. – Command output: Blinds Up/Down, light On/Off.

Example for an RMR report

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 example shows the command the resulting report for room TCR74. The report shows that this room contains one RX controller with TEC number 39. The report shows its parameters and values:

```
rmr @tcr74
RMR        17:06:05                                              16-AUG-1999/MO

!FI TCR  $d070'TCR74  (T39)
              16-AUG-1999 17:04:18 AOPST=0
    SOPST=0                        APRST=0
    SOMOD=0                        ASTH =0                    VSPA =0
    MACT =0                        ASTC =0                    VEXA =0
    MOPST=2                        RRSC =0                    RWINO=0
+-----+------+-----+-----+-----+-----+-----+-----+------+------+------+------+
! TEC ! ARTP !OHWA !OCWA !OXWA !OHAIR!OCAIR!OHHB !OEAIR ! OFAN !AIRVS1!AIRVE !
!     !      !OHWA2!OCWA2!     !     !     !     !      !      !AIRVS2!      !
!     ! [C]  ! [%] ! [%] ! [%] ! [%] ! [%] ! [%] ! [%]  ![Step]![m3/h]![m3/h]!
+-----+------+-----+-----+-----+-----+-----+-----+------+------+------+------+
! 39  ! 27.2 !   0 ! 100 !   0 !   0 !   0 !   0 !    0 !    3 !    0 !    0 !
!     !      !   0 !   0 !     !     !     !     !      !      !    0 !      !
+-----+------+-----+-----+-----+-----+-----+-----+------+------+------+------+
```

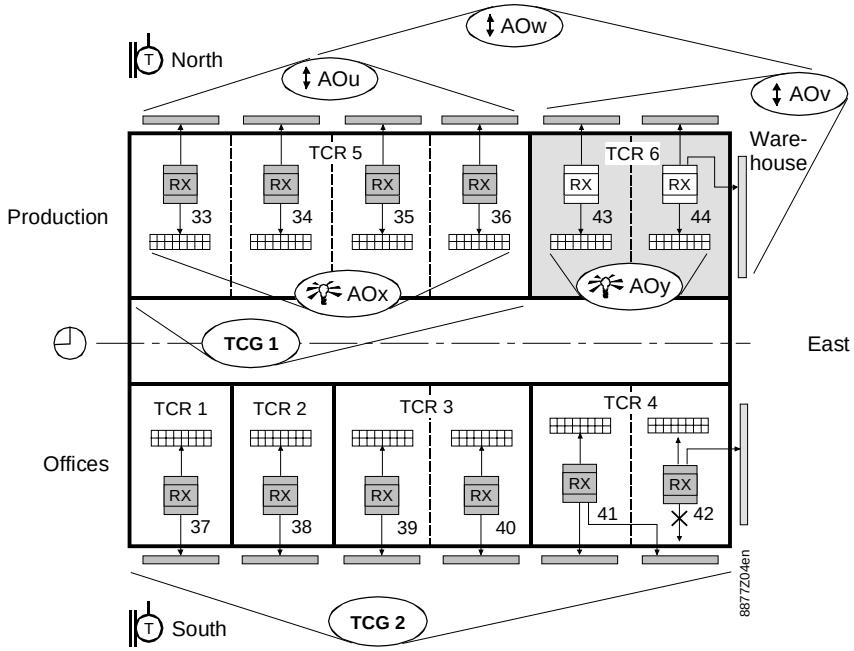
Examples: ARTP = Current room temperature.= 27.2 °C
OCWA = Positioning value at cooling output = 100 %
For the meaning of the other parameters, refer to the "BPS process image", volume 2.

Plant example

Floor plan / situation

The following example shows a floor plan with an integrated HVAC + blinds and lighting RX application. Situation:

- The North and South sides of the floor each consist of 6 room modules with one RX controller and the controller's peripherals. The corresponding TEC rooms are defined according to the room modules (master/slave relations where needed).
- The offices and production are located in different HVAC zones, but have the same occupancy hours.
- The warehouse is kept at a constant temperature. The blinds normally are down.
- The North and South side of the building each have their own energy distribution for heating and cooling energy.



Necessary groups

Below are the groups that are necessary to achieve the intended functionality (for reasons of clarity, the above illustration does not contain all of them):

Groups	Designation / explanation
HVAC	– TCG 1: Production (HVAC group North). – TCG 2: Offices (HVAC group South). The warehouse is not a group, as it is an individual room at constant temp.
Blinds ↕	– AOu: Production. – AOv: Warehouse. – AOw: Front side North. – Further groups are: Building front South, building front East, entire floor. Note: In the corner office TCR4, the blinds on the East side of the building rather than being connected to the South group are connected to the East group to ensure that the shading function works properly.
Lighting	– AOx: Production. – AOy: Warehouse. – Further groups are: Offices, entire floor.
TED	By allocating the associated RX controllers, the following four groups, for example, can be formed for energy demand: – Heating demand for production, cooling demand for production. – Heating demand for offices, cooling demand for offices.

Additional information

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

CM2Z8338E Integrating DESIGO RX in VISONIK.