SattCon 05-65 and SattCon OP65 are two systems in the SattCon 05 Slimline system family.

SattCon 05-65 is a complete system with all the necessary functions required for control applications, either independently or in cooperation with other systems. There are two basic configurations of the SattCon 05-65, one has only digital while the other has both digital and analogue inputs and outputs. Refer to the data sheet for SattCon 05 Slimline for more information about the I/O units and accessories.

SattCon OP65 is a unique control system where operator interaction and alarm functions are combined in the same unit. Advanced control features are standard in the SattCon OP65, providing all the functions required for modern process control. The SattCon OP65 has a back-lit LCD display and a numeric keyboard with 11 function keys. SattCon OP65 can also be used as a traditional operator interface communicating with other systems via COMLI. Digital and analogue signals are connected via the range of I/O units in the SattCon 05 Slimline family.

The BASIC and SattCon process control language are combined in a unique manner in SattCon 05-65/OP65. A SattCon 05-65/OP65 program consists of a BASIC section and a PLC section. Communication between the two sections of the program is achieved using registers available to both. The use of BASIC in SattCon 05-65/OP65 makes it possible to write protocols for communication with other units, to carry out advanced arithmetic calculations and to generate comprehensive reports on screen or on a printer.

SattCon 05-65/OP65 has the following features:

- BASIC provides far more extensive options than normally available in a PLC.
- PID loops.
- Programming via personal computers using the DOX 10 or DOX5 program, alternatively via a VDU.
- Serial communication channels for terminal, printers and COMLI communication, including a channel dedicated and controlled by the BASIC portion of the program.
- Ability to expand with analogue and digital I/O units and positioning units.
**Program Functions**

**PLC Program**
The software which controls both the process and text output is known as the PLC program. As well as logical instructions SattCon 05-65 can handle three levels of subroutines, shift registers and sequencers capable of controlling up to 256 sequences of 100 steps each.

SattCon 05-65/OP65 has the capability to handle input and output signals. In addition to the standard control functions, you can program your own limiter modules, ramp functions etc. There are instructions for the four basic arithmetic operations, square root extraction and logical calculations. The results or intermediate values can be stored in 28000 registers.

**BASIC Program**
The BASIC program communicates with the PLC program, via register and memory flags, using a number of language extensions not found in standard BASIC. BASIC provides the option of carrying out complicated calculations and writing protocols for communication with other units. All text processing for the display/screen or printer and data input, is handled by the BASIC program with the aid of additional special instructions.

**Timers and Counters**
SattCon 05-65/OP65 has 64 timers and 64 counters.

**Time Channels**
There are 16 programmable time channels in the SattCon 05-65/OP65 which can start and stop activities at particular weekdays and times of the day.

**Controllers**
SattCon 05-65/OP65 has eight controllers with P, PI, PD or PID functions which can be cascaded. The sophisticated controllers even allow gain scheduling to be controlled by a process parameter via the PLC program.

**Error Supervision**
SattCon 05-65/OP65 has several functions which aid troubleshooting and commissioning. These include automatic error supervision of analogue inputs/outputs and dynamic display of sequencer steps.

**Communication**
SattCon 05-65/OP65 has an opto-isolated serial interface for PLC programming or communication via COMLI. An additional COMLI channel and an undedicated serial channel may be added using a DX232 (not opto-isolated) or DX485G communication board. The boards are connected to the DXDSUB-SL unit via two D-sub connectors.

The undedicated serial channel may be used for BASIC programming or for two-way communication with other systems e.g. weighing machines etc. There is a character buffer for capturing fast incoming data and this can be read character by character from the BASIC program.

The channel can be configured for 7/8 data bits and Odd/Even/None parity.

Signal status, register values, time etc. can be transferred or requested via COMLI.

COMLI can also be used to transfer values and programs between SattCon 05-65/OP65 and a personal computer. The system may be programmed on-line via the COMLI network (not valid for BASIC or DOX 10).

**Programming and Backup**
PLC programming is carried out using a standard VDU terminal or a PC running the DOX 10 or DOX5 program. These allow programs to be developed off-line with identifiers (plain text programming) and comments. The function block feature simplifies program development by allowing code to be reused. When the program has been transferred to SattCon 05-65/OP65, the program can be supervised online using DOX 10/DOX5 which still shows identifiers etc.

BASIC is programmed on-line via the BASIC channel using a VDU or a PC with the terminal emulator in DOX 10/DOX5.

The entire program can be backed up using the SBUPO5 backup unit or a PC with the DOX 10 or DOX5 program.

**Program Documentation**
All programmed functions can be displayed on a VDU or printed.

**Hardware**
SattCon 05-65 has a slim profile and a very compact construction. The system contains a central unit, an I/O unit and a communication board. SattCon OP65 also has a similarly slim profile and is designed for flush mounting into the front panel of a control cabinet or equivalent.

**Keyboard**
On the SattCon OP645 there are eleven function keys in addition to the numerical keys for entering values.

Strips of explanatory text can be inserted above the function keys. The keys are provided with a "mechanical click" for distinct input.

**Display**
The operator’s unit is fitted with a backlit LCD display having four rows of 40 characters. The viewing angle can be adjusted with a potentiometer.

Character sets for seven countries are included as are certain graphic characters.

**Memory**
Program memory is CMOS with 25 kbytes for the PLC program and 20 kbytes for BASIC instructions. The memory is battery-backed and so retains its contents when the power supply is lost.

**I/O**
The digital I/O area comprises 3072 memory cells which are used either as inputs/outputs or working memories; 60 cells are battery-backed.
Expansion Units

The number of inputs and outputs can be increased by connecting up to four expansion units (up to three for Slimline in addition to the basic unit). The following expansion units can be combined depending on the user’s requirements.

All outputs must be fused externally.

- SD32D is a digital I/O unit with 32 inputs for 16–32 V DC and 28 transistor outputs for 12–50 V DC.
- The SD24D is a digital I/O unit with 24 optocoupled transistor inputs for 16–32 V DC and 24 optocoupled transistor outputs for 15–50 V DC.
- SD24RS is a digital I/O unit with 24 optocoupled inputs for 16–32 V DC and 16 relay outputs.
- SDA is a digital/analogue I/O unit with 16 digital optocoupled inputs for 16–32 V DC, 16 digital optocoupled outputs for 12–50 V DC, 4 analogue inputs for 0–5 V/1–5 V/0–10 V/0–20 mA/4–20 mA with common signal ground and two analogue outputs for 0–10 V/0–20 mA/4–20 mA.
- SACV is an analogue I/O unit with 12 analogue inputs for 0–10 V/0–20 mA/4–20 mA and 4 analogue outputs for 0–10 V/0–20 mA/4–20 mA.

Dimensions

All dimensions are given in mm
## Technical Data

**CPU**
- Dallas 80C320 or equivalent

**Program memory**
- 25 kbytes for the PLC program and 20 kbytes for the BASIC program

**Cycle time**
- Minimum 50 ms, can be selected in steps of 50 ms

**Working memory**
- Total of 3072 bits. Reduced by the number of inputs/outputs. 60 bits are battery-backed. The working memory can be accessed from PLC and BASIC
- 64 pcs., 0.1 s – 9 h 6 m 7 s

**Timers**
- 64 pcs., 65SS5 max. count

**Counters**
- 28000 pcs. Can be accessed from PLC and BASIC

**Registers (16-bit)**
- 256 pcs., 100 steps each

**Time channels**
- 16 pcs. programmable

**Text strings**
- Programmed and controlled from BASIC

**Controllers**
- 8 pcs. programmable; P, PI, PD or PID

**Display (OP65)**
- LCD with back-lighting. 4 rows of 40 characters. Controlled from BASIC

**Keyboard (OP65)**
- Numerical keyboard and 11 function keys. Handled by BASIC

**In/outputs (05-65)**
- SACV *
  - 12 analogue inputs and 4 analogue outputs 0–10 V DC/0–20 mA/4–20 mA
- SD24D *
  - 24 digital optoisolated inputs 24 V DC, 24 digital optoisolated outputs 12–50 V DC, 0.8 A
- SD24RS *
  - 24 digital optoisolated inputs 24 V DC, 16 relay outputs 250 V AC/120 V DC
- SD32D *
  - 32 digital inputs 24 V DC and 28 outputs, 12–50 V DC, 0.8 A
- SDA *
  - 16 digital optoisolated inputs 24 V DC, 16 digital optoisolated outputs 12–50 V DC (0.8 A), 4 analogue inputs 0–5 V/1–5 V/10 V/0–20 mA/4–20 mA and 2 analogue outputs 0–10 V/0–20 mA/4–20 mA.

**Fused**
- Inputs: internal
- Outputs: external

**Expansion**
- Up to 4 I/O units (up to 3 for Slimline in addition to the basic unit)

**Communication**
- 2 serial channels RS232/RS485, Master or Slave selectable, controlled from PLC. One of the channels also used for PLC-programming.
- 1 serial channel for BASIC. Also used for BASIC programming

**Programming**
- PLC
  - VDU terminal or PC with DOX 10/DOXS; RS232 via 25-pole D-sub connector
- BASIC
  - Via DXDSUB
- Backup
  - Total with SBUP05, DOX10 and DOX5
- Printer connection
  - RS232 via 25-pole D-sub connector, Controlled from BASIC

**Power supply**
- 24 V DC, -15% +20%. Max. ripple 5% of nominal power

**Power consumption**
- SattCon 05-65: 3.9 W including DX232 *
- SattCon OP65: 6.7 W including DX232 *

**Environment**
- Approvals (when product or packaging is marked)
  - CE-marked and meets EMC directive 89/336/EEC according to the following standards: EN 50081-2 and EN 50082-2.
  - Low Voltage Directive 73/23/EEC with supplement 93/68/EEC according to the following standard: EN61131-2
  - UL listed according to UL 508

**Protection class**
- SattCon 05-65: IP20
- SattCon OP65: IP65

**Ambient temperature**
- Operating: 0 to +50 °C
- Non-operating: -25 to +70 °C

**Relative humidity**
- 10–95%, non-condensing

**Dimensions**
- SattCon 05-65: W342 X H200 X D47 mm
- SattCon OP65: W216 X H216 X D76 mm
- Panel cutout: H205 X W205 ±1 mm

**Weight**
- SattCon 05-65: 2.1 kg
- SattCon OP65: 1.8 kg

**Order codes**
- SCOP65
- I/OCOP.O3M
- I/OCOP1.OM
- I/OCOP2.OM
- SBUP05
- CU05-65/SD32D/DX232
- CU05-65/SD32D/DX485G
- CU05-65/SDA/DX232
- CU05-65/SDA/DX485G
- SBUP05.OP
- CU0565/SD32D/DX232
- CU0565/SD32D/DX485G
- CU0565/SDA/DX232
- CU0565/SDA/DX485G
- SattCon 05-65/OP65 (V4), VDU Programming
- SattCon OP (V4) Installation and Maintenance
- SattCon 05 Slimline (V4) Installation and Maintenance
- SattCon OP (V4) DOX 10 Programming
- DOX 10 User’s Manual
- MCS BASIC-52 User’s Manual

**CPU**
- Dallas 80C320 or equivalent

**Program memory**
- 25 kbytes for the PLC program and 20 kbytes for the BASIC program

**Cycle time**
- Minimum 50 ms, can be selected in steps of 50 ms

**Working memory**
- Total of 3072 bits. Reduced by the number of inputs/outputs. 60 bits are battery-backed. The working memory can be accessed from PLC and BASIC
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**Controllers**
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- LCD with back-lighting. 4 rows of 40 characters. Controlled from BASIC

**Keyboard (OP65)**
- Numerical keyboard and 11 function keys. Handled by BASIC

**In/outputs (05-65)**
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  - 12 analogue inputs and 4 analogue outputs 0–10 V DC/0–20 mA/4–20 mA
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  - 24 digital optoisolated inputs 24 V DC, 24 digital optoisolated outputs 12–50 V DC, 0.8 A
- SD24RS *
  - 24 digital optoisolated inputs 24 V DC, 16 relay outputs 250 V AC/120 V DC
- SD32D *
  - 32 digital inputs 24 V DC and 28 outputs, 12–50 V DC, 0.8 A
- SDA *
  - 16 digital optoisolated inputs 24 V DC, 16 digital optoisolated outputs 12–50 V DC (0.8 A), 4 analogue inputs 0–5 V/1–5 V/10 V/0–20 mA/4–20 mA and 2 analogue outputs 0–10 V/0–20 mA/4–20 mA.

**Fused**
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- Up to 4 I/O units (up to 3 for Slimline in addition to the basic unit)

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- 2 serial channels RS232/RS485, Master or Slave selectable, controlled from PLC. One of the channels also used for PLC-programming.
- 1 serial channel for BASIC. Also used for BASIC programming

**Programming**
- PLC
  - VDU terminal or PC with DOX 10/DOXS; RS232 via 25-pole D-sub connector
  - Via DXDSUB
- BASIC
  - Via DXDSUB
- Backup
  - Total with SBUP05, DOX10 and DOX5
  - RS232 via 25-pole D-sub connector
- Printer connection
  - RS232 via 25-pole D-sub connector

* For details see the Installation and Maintenance manual