

SattCon OP45/OP45SB

From Program Version 4.0



SattCon OP45 is a unique combination of control system and operator interface housed in a single unit. Powerful digital and analogue control functions make it suitable for a wide range of machine and process control applications.

Input/Output signals are connected using expansion units from the SattCon 05 family. Both the original 05 series and the newer Slimline units are compatible with SattCon OP45.

SattCon OP45 can also be used solely as an operator interface, communicating with a control system via COMLI. SattCon OP45SB has an integral SattBus interface instead of COMLI.

SattCon OP45 delivers these main features:

- PID loops and arithmetic functions for process control.

- Programmed using a standard VDU, or via a personal computer with the DOX 10 or DOX 5 software package.
- Serial ports for VDU, printer, and communication via COMLI or SattBus.
- Back-lit LCD displays four lines of 40 characters.
- Numeric keypad plus 11 function keys; "Shift" is used to provide a total of 22 user-defined keys.

Software 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 OP45 can handle three levels of subroutines, shift registers, and sequencers capable of controlling up to 256 sequences of 100 steps each.

Execution of a fast loop, which executes segments of the PLC program as fast as 1 ms, can be started via I/O signals. Fast loop is not available in SattCon OP45SB.

Up to 36 analogue inputs and outputs can be handled. In addition to the control loops provided, the PLC program can be used to implement alarm points, ramp functions etc.

There are instructions for the four arithmetic functions, square root extraction and data handling. For data storage there are 28000 registers.

Timers and Counters

SattCon OP45 has 64 timers and 64 counters.

Time Channels

16 programmable time channels can start and stop activities at preprogrammed times and days.

Controllers

SattCon OP45 has eight control loops with P, PI, PD or PID functions which also can be connected in cascade. It is also possible to have process controlled gain scheduling via the PLC program.

All controller values can be presented in bargraph format on the operator display.

Diagnostics

The SattCon OP45 has several functions which help fault finding and commissioning, e.g. automatic fault monitoring of the analogue inputs and outputs, and dynamic display of sequencer steps.

Text Handling and Dialogue

512 messages of 32 characters can be used for reports, alarms and dialogue messages. Messages can include the date, time and process values.

Large numerical values, and values with up to five decimal places can be handled if several consecutive registers are used.

Numerical information may be scaled automatically and displayed in the correct physical units with up to 5 decimal places. A check of min./max. values is performed at input.

Any ASCII character can be printed out from a register or from the text line.

Control codes, for example for positioning the cursor, can be included

in the text. The display can be divided so that the lowest line is used to display legends for the five top function keys, for use in different operating conditions.

Operator Functions

You have full freedom to create your own dialogues and display screens needed for operator communication. The built-in keyboard allows manual start and stop of plant, initiation of text output, menu selections etc.

Since SattCon OP45 is also a control system, it can be used to implement process changes very quickly, and can rapidly update the operator display.

Communication

SattCon OP45 includes an optoisolated serial interface for programming or communication via COMLI. Using the DX232 (without optic isolation) or DX485G expansion boards two separate COMLI channels are provided, as well as a channel for programming. In addition a printer port is always available.

The text handling includes facilities for interface to Hayes modem.

Using COMLI, signal status, register values, etc. can be transferred to and from other systems which support COMLI. COMLI also allows a personal computer to transfer programs and data to and from SattCon OP45. It is also possible to make changes to the program via the COMLI network (not valid for DOX 10).

SattCon OP45SB communicates via SattBus instead of COMLI. SattBus is a two-wire asynchronous token passing bus. A maximum of 120 nodes may be connected over a maximum length of 2000 m. A SattBus network requires that one of the units is the supervisor. SattCon OP45SB does not have this function and, as a consequence, an SBC (SattBus Converter) must be included in a SattBus network.

In addition to the ability to transfer and request signal status, register values, time etc., programs can also be transferred and requested via SattBus (not valid for DOX 10).

The OP45SB can be equipped with a channel for VDU and printer via DX232 or DX485G communications board.

Programming and Backup

Programming and backup are performed by a standard VDU or with a personal computer using the DOX 10 or DOX 5 program. Software can be developed off-line using identifiers and comments. Function blocks and library modules make programming easy.

When the program has been transferred to the SattCon OP it can be supervised on-line via DOX 10/DOX 5, which still shows identifiers etc. Program backup may be made to floppy disc via PC, or to Flash PROM using the SBUP05 backup unit.

SattCon OP45SB must be equipped with a DX232 or DX485 communication board, if it is to be programmed via a VDU or DOX 10. Programming and backup may be performed over the SattBus network (via an SBC) using PC and the DOX 5 program.

Program Documentation

All programmed functions can be shown on the VDU and/or printed out.

```
SattCon 05
-----
User:
Date 98-11-26
Project:

Controller No.
-----
00 01 xx xxx xx xxx xx

Controller No 00
I/O-addresses On/Off (P/P1/PD/PID) 0040
Controller type P1
Setpoint (% AL R) A1100
Input (AI, R) A1104
Gain (G) 0.5S
Sample time (..R) 4.50
Integration time (s, R) 200.0s
Deadzone: Input-Setpoint (% R) 0.0%
Direct Control (Y/N) N
Minimum Out (% R) 0.0%
Maximum Out (% R) 100.0%
Digital Output (Y/N) N
Output (AO, R) AO100
Cascade Controller (N/M) N

Controller No 01
I/O-addresses On/Off (P/P1/PD/PID) 0040
Controller type P1
Setpoint (% AL R) A1100
Input (AI, R) A1104
Gain (G) 0.5S
Sample time (..R) 4.50
Integration time (s, R) 200.0s
Deadzone: Input-Setpoint (% R) 0.0%
Direct Control (Y/N) N
Minimum Out (% R) 0.0%
Maximum Out (% R) 100.0%
Digital Output (Y/N) N
Output (AO, R) AO100
Cascade Controller (N/M) N
```

Program documentation can be enhanced by the inclusion of comments and identifiers using a personal computer with the DOX 5 program. You have also the possibility to make the documentation in graphical function blocks, with the DOX 10 program.

Hardware

SattCon OP45 has a low profile and is designed for mounting on the front of instrument cabinets and similar equipment.

Keyboard

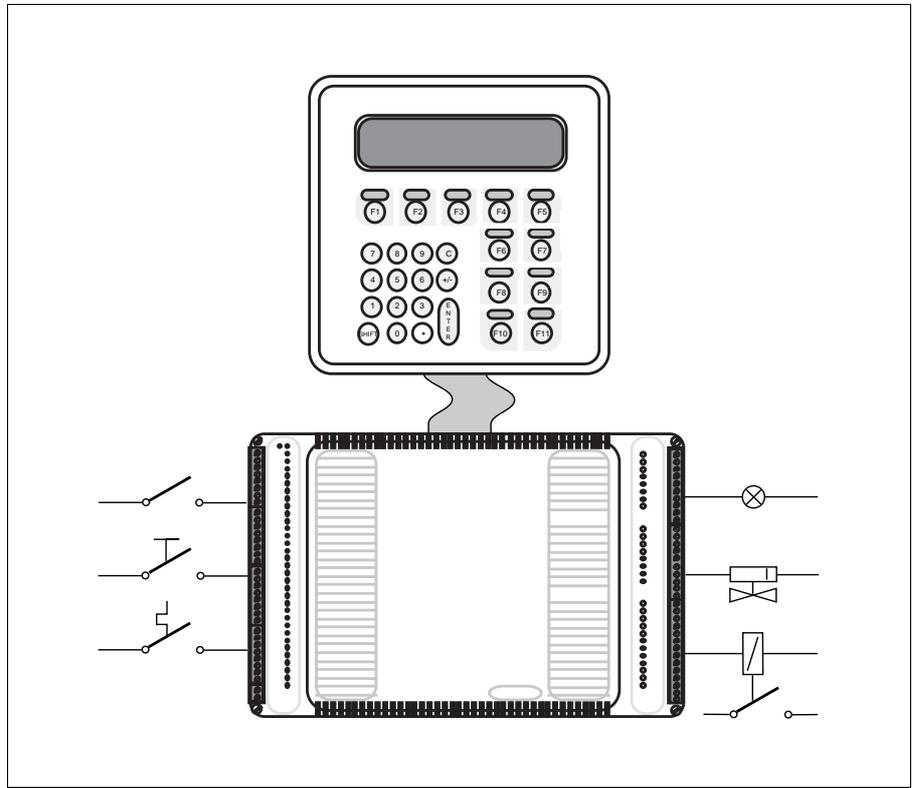
In addition to the numeric keys for entering values, there are 11 function keys which, used together with the SHIFT keys permit 22 memory cells to be accessed. A legend strip can be inserted above each key. The keys give a distinct “mechanical click” to confirm operation.

Display

The operator interface has a back-lit LCD display with four rows of 40 characters. The viewing angle can be adjusted by a potentiometer. Character sets for seven countries are included, along with some graphics characters and functions for horizontal bargraphs. All ASCII characters can be displayed.

Inputs/Outputs

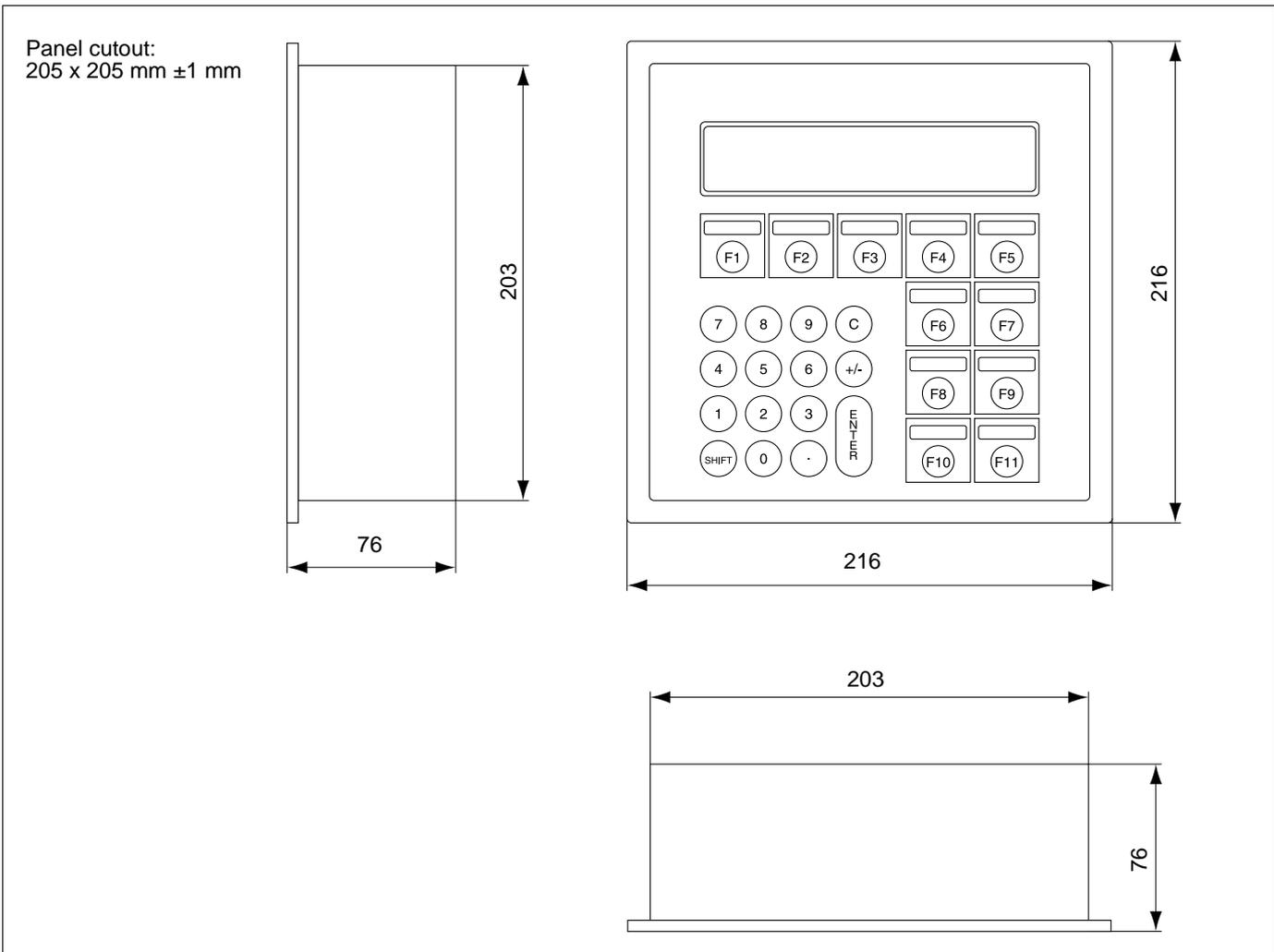
Up to four expansion units can be connected to the SattCon OP45 to handle analogue and digital signals. Any expansion unit in the SattCon 05



range may be used. Expansion units are supplied with short connecting cables, however cables with up to 2 m length

may be ordered as accessory items. All I/O units are presented in the data sheet of SattCon 05 Slimline.

Dimensions



Technical Data

CPU	Dallas 80C320 or equivalent	DOX 5	Software for personal computer. Off-line programming with IDF and comments. Some limitations exist
Program memory	25 kbytes available for the PLC program. CMOS-RAM with battery backup, battery life approx. 3 years in operation, 5 years in storage (25°C). Battery type: CR2032	DOX 10	Software with off-line-programming for personal computer. Graphic programming is possible
Cycle time	Bit instructions: typically 1.2 µs/instruction. Word instructions: typically 20 µs/instruction	Backup	Total with SBUP05, DOX 10 and DOX 5
Working memory	Total 3072 memory cells, reduced by the number of inputs and outputs. 60 memory cells are battery-backed	Printer connection	
Timers	64 pcs., 0.1s - 9 h 6 m 7 s	SattCon OP45	RS232 via 25-pole D-type connector
Counters	64 pcs., 65535 steps, up/down counter	SattCon OP45SB	Via DX232/DX485G
16-bit registers	28000 pcs	Power supply	24 V -15% +20%. Max. ripple 5% (100–120 Hz). Extra power supply is normally not required for expansion units, although SDA and SACV requires 24 V DC -15% +20% *
Sequencers	256 pcs., with 100 steps each	Power consumption	5.7 W (24 VDC) *
Time channels	16 pcs. programmable	Environment	Industrial premises
Text messages	512 x 32 characters. Time, date and process values can be included. Texts can also be sent to printer. Text handling includes dial-up function via Hayes modem	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
Controllers	8 pcs. programmable; P, PI, PD or PID	Protection class	IP65
Inputs/outputs	Up to 4 expansion units with analogue or digital signals or combinations of these *	Ambient temperature	Operating 0–50°C Non-operating -25 to +70°C
Pulse input	Max 2 kHz. Only when the first I/O unit is SD32D or SDA. Not valid for SattCon OP45SB or if a DX board is fitted in the OP unit	Humidity	10–95%, non-condensing
Communication		Weight	1.7 kg
SattCon OP45	1 RS232 or RS485 (galv. separated) serial channel, selectable Master/Slave. With expansion board 2 channels are available RS232/RS485 (DX232 or DX485G)	Product name	Order code
SattCon OP45SB	SattBus communication. Does not have supervisor function. 120 nodes, max. 2000 m	SattCon OP45	SCOP45
Display	Back-lit LCD display 4x40 characters	SattCon OP45/DX232	SCOP45/DX232
Keyboard	11 keys x 2 for function selection, numeric keys etc.	SattCon OP45/DX485G	SCOP45/DX485G
Programming		SattCon OP45SB	SCOP45SB
SattCon OP45	VDU terminal or PC with DOX 10/DOX 5; RS232 via 25-pole D-type connector	SattCon OP45SB/DX232	SCOP45SB/DX232
SattCon OP45SB	VDU terminal via DX232/ DX485G or via SattBus and a SattBus Connector	SattCon OP45SB/DX485G	SCOP45SB/DX485G

* For details refer to the Installation and Maintenance manual



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