

MODULAR HEADENDS

«SDC» — Reception Equipment for Controlled Access Digital Satellite TV > CE

- Digital Satellite TV reception, standard DVB-S.
- Process of De-Encryption and Digital to Analogue Transmutation (QPSK → AM). The controlled access TV stations transmitted in QPSK Sat-TV channels are de-encrypted and located onto conventional vestigial side band VHF/UHF channels (any TV system or Colour system).
- An SDC headend includes:
 - As many SDC Receiver Modules as there are controlled access TV stations.
 - Power Supply Modules (one per five receivers).
 - Wall-fixing Base-Plate or Rack-frame. Additional base-plates can be joined horizontally or mounted vertically if required.
 - Usually, one Housing unit.

The output from the headend can be combined to other terrestrial or satellite signals onto the one cable which forms the backbone of the existing network. With an SDC installed in the headend, the end user does not require a Set Top Box or any additional devices to view the controlled access digital TV stations being distributed.

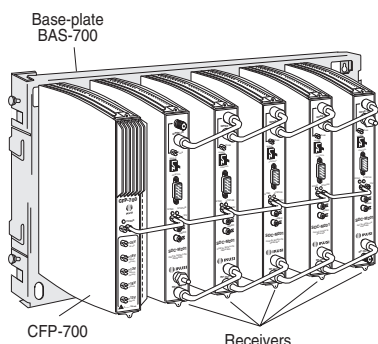
Functional ClassA Modules

The **ClassA** family from IKUSI includes the following functional modules for SMATV/CATV headends:

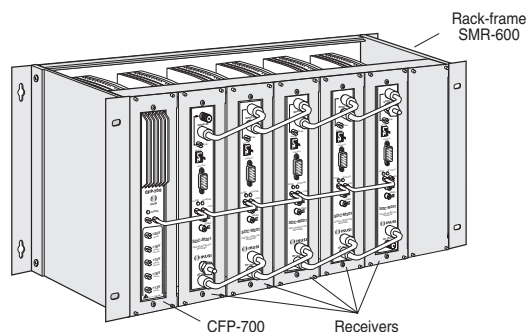
- «SDC» Receivers for Controlled Access Digital Sat-TV. Any selectable TV-channel. Output level: 80 dB μ V.
- «SRF-100» Receivers for Free-To-Air Digital Sat-TV. Any selectable TV-channel. Output level: 80 dB μ V.
- «SRF-500» Receivers for Free-To-Air Digital Sat-TV. In-factory set TV-channel. Output level: (2x) 120 dB μ V.
- «TRF-100» Receivers for Free-To-Air Digital Terrestrial-TV. Any selectable TV-channel. Output level: 80 dB μ V.
- CTP-200 Video Encoder.
- CFP-700 Power Supply.

All modules are compact, simple and easy to place onto the wall-fixing baseplates BAS-700 and BAS-900. The **ClassA** modules can also be integrated into standard 19" racks using the SMR-600 rack-frame. All the connections are made on the front panel of the modules.

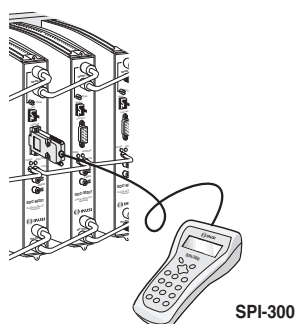
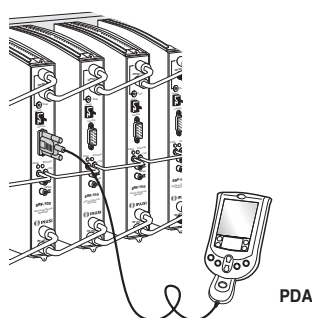
Adjustments can be done either through a PDA with PALM OS, version 3.5 or later, or through the SPI-300 Programming Unit from IKUSI. One or the other are connected to the DB-9 front panel socket at each module. Adjustments can also be done remotely via modem from a PC.



■ SDC Receiver Modules placed on the BAS-700 base-plate.



■ SDC Receiver Modules placed in the SMR-600 rack-frame.



— Programming Connections through PDA and SPI-300.

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Functional description of the SDC Receiver Modules

An SDC receiver module carries out the complete channel processing from the input to the output:

- it tunes a QPSK Sat-IF digital channel,
- selects a TV station from the multiplex received, and
- presents it, de-encrypted, on a conventional TV channel which is selectable throughout the 45-862 MHz band.

There are different models in terms of the Encryption System and Operator for the receiving signal, as well as the TV System and the Audio Mode for the single-channel output signal. At each module, an internal smart card allows to get access the engaged services.

Programming of each module involves the following settings:

- Central Input Frequency (1 MHz increments).
- Input Data Rate (0.001 MSym/s increments).
- TV Station and Audio Service.
- Parameters of the output TV channel (Video Carrier Frequency, TV System, Colour System, Video Modulation Depth, Audio Modulation Index, Carrier Level Ratio, Output Level).
- Image Format, if the original format is 16:9. The possible conversions are either 16:9 to 4:3 Pan&Scan or 16:9 to 4:3 Letter-Box.

The PDA or SPI-300 used for programming offer information about input BER and the general operating status of the connected module. The parameter set are controlled by microprocessor and remain unalterable, unless they are modified through the programming-controller. The programming software creates a bank of preset memorized settings which allows the technician to quickly load repetitive settings on several modules.

The output signal is extremely clean (spurious at -60 dB max) enabling adjacent channel layouts. An exceptionally low broadband noise floor permits the use of multiple modules in a headend with very little deterioration of the C/N ratio.

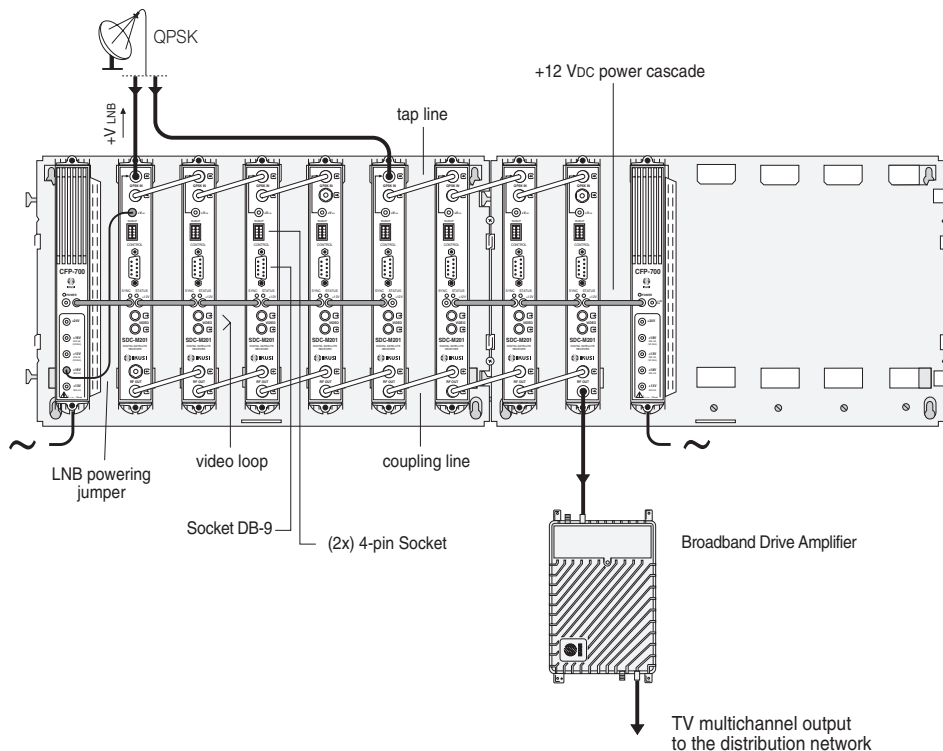
Simple connecting

The SDC receiver modules feature two directionally coupled input and output ports. Sat-IF signal can therefore be directly fed into the input port of the first module, which in turn passes it through the coupler to the next and so forth. On the output side, the same procedure is repeated which forms the channel coupling. The sum of the combined channels is then connected in the same way to a drive amplifier, which then feeds the distribution network.

For power connection, each module has two DC banana sockets that allow to build a +12 VDC cascade. A third banana socket is available to connect the power for the attached LNB.

The SDC receivers have video loop-through capacity, so they can be used with encryption systems and with converters of number of lines of the video signal. The external loop is switched under control software.

Programming connection is made to the DB-9 front panel socket at each module. Just above of this socket there are two smaller 4-pin ones, named IKUSUP, which are used to install a property local bus when a remote programming must be carried out (see diagram on the bottom of page 4).



- Example of «SDC» headend for eight encrypted digital TV stations; four stations arrive through a down lead cable and the other four ones through another. It contains 8 Receiver Modules and 2 Power Supply Modules, all fitted on 2 horizontally joined Base-plates.

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Receiver Modules

TV System of the Output Channel (it depends on the receiver model)		B / G	D / K / K' / I / L	M / N
Audio Operation Mode (it depends on the receiver model)		Mono		Stereo / Dual FM Modulation (Rec. UIT-R 707-3)
Colour System of the Output Channel		PAL , SECAM , NTSC		
Selectable output channel located between:		MHz	45 - 862	
Input Section (QPSK)	Input frequency	MHz	910 - 2150	
	Input level	dBm	-60 ... -25	
	Input loop-through loss	dB	0 (±1)	
	AFC pull-in range	MHz	±5	
	Input data rate	MSym/s	2 ... 45	
Decodification Section	Standard		MPEG-2	
	Video Processing		Main Profile @ Main Level	
	Audio Processing		Layer II (Five channels)	
	Teletext		Yes	
	Image Format Conversion		16:9 to 4:3 Pan&Scan and 16:9 to 4:3 Letter-Box	
External Video-Loop	Output level (free base-band video signal)	Vpp	1.0	
	Input level (encrypted base-band video signal)	Vpp	0.9 ... 1.1	
Video & Audio Re-modulation Section (1)	Adjustable video modulation depth	%	80 to 90	
	Adjustable audio peak deviation	kHz	±10 to ±50 (except System L)	
	Adjustable audio modulation depth	%	10 to 80 (System L)	
Output Section (TV Channel)	Adjustable output level	dBμV	65 to 80	
	Output loop-through loss	dB	0.7 (typ.) , 1.2 (max)	
	Adjustable carrier level ratio	dB	10 to 20	
	Spurious in band	dBc	< -60	
	C/N ratio in channel (ΔB=5MHz)	dB	≥ 61	
	Broadband noise (ΔB=5MHz)	dBc	< -75	
General	Supply voltage	VDC	+12 (0.9 A)	
	Operating temperature	°C	0 ... +45	
	Input RF connector type		(2x) F female	
	Output RF connector type		(2x) F female	
	DC connector type		“banana” socket	
	Video-loop connector type		(2x) RCA female	
	Programming Interface		RS 232 / DB-9	
	Local bus connector		(2x) 4-pin socket	
	Dimensions	mm	230 x 195 x 32	
	Packed weight	kg	1.3	

(1) RECEIVERS WITH "MONO AUDIO" OPERATION: When selecting dual audio services, the output TV channel sound carrier may be modulated with the information of "audio1", or "audio2", or "audio1+audio2". If the audio service is stereo, the sound carrier is inflexibly modulated with the "L+R" information.

- Each module is packed with:
 - 2 F plug bridges, 64 mm length, for input tap line and output coupling line.
 - 1 DC plug bridge, 53 mm length, for connection of +12 VDC voltage.

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Programming Unit



SPI-300

Model	SPI-300
Reference	4070
<ul style="list-style-type: none"> • For setting and controlling the SDC receivers and the rest of the ClassA and ClassB functional modules, as well as those of the MDI, MCP, SZB and STG families from IKUSI. • 20x4 character alphanumeric display. Cable connection. User friendly software automatically identifies the connected module and the specific programmable features. Built-in diagnostic and error identification. Module firmware updating. Firmware of the SPI-300 can also be updated through a PC. • Microprocessor controlled. Simply to use software. Numerical and function keys. • Capacity of 80 preset allocations for repetitive functional modules. • Two interface cables supplied, 50 cm length. The "RJ-45 / DB-9" cable is used to link the SPI-300 to the ClassA and ClassB modules, and the "RJ-45 / USB" cable is used for the MDI, MCP, SZB and STG modules. • No battery required. Powered through the interface cable (max consumption: 150 mA). DC jack to connect a +12 VDC voltage from an auxiliary power supply when updating the internal firmware through a PC. • Dimensions: 160x75x40 mm. Packed weight: 	

Local Programming Software for PDA



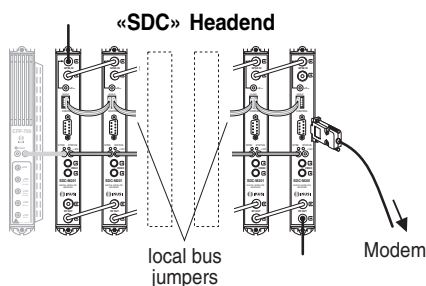
PRG-101

Model	PRG-101	PRG-100	PRG-102	PRG-103
Reference	9502	9501	9503	9504
Language	English	Spanish	French	Italian
<ul style="list-style-type: none"> • Software package to program the SDC receivers and the rest of the ClassA and ClassB functional modules through a PDA with PALM OS, version 3.5 or later. • Automatic identification of the connected module and the specific programmable features. Built-in diagnostic and error identification. Module firmware updating. • Use of Module Configurations (up to 100) to quickly load repetitive data. • Shipped in CD-ROM. 				

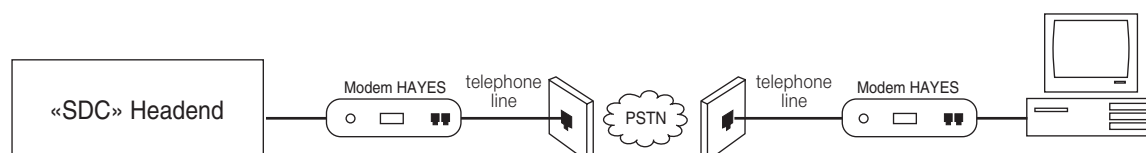
Remote Programming Software for PC

Model	PRG-301	PRG-300
Reference		
Language	English	Spanish

The PRG-301 / PRG-300 software packages are shipped in CD-ROM. They allow to monitor and program from a remote PC an unlimited number of «SDC» headends. The applications operate under Microsoft Windows 95, 98, NT, 2000 and XP. Communication with the PC is accomplished through Hayes modems and telephone lines. In the headends, a local bus must be built by interconnecting in cascade the IKUSUP front panel sockets using BUS-013 (Ref.) jumpers. The modem is connected to the DB-9 socket of the last module at the right end of the cascade.

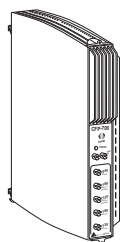


• Connection Diagrams for Remote Programming

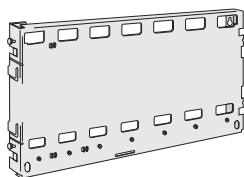


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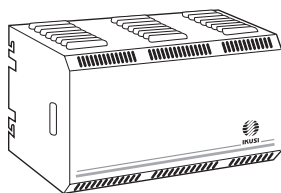
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CFP-700



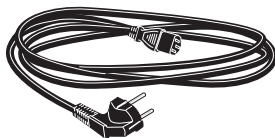
BAS-700



COF-700



BUS-013



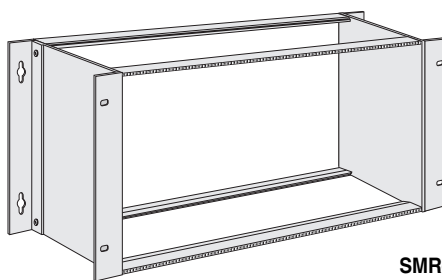
COR-220



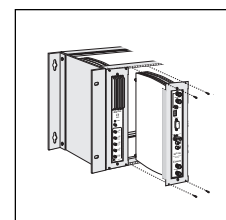
PMR-600



OMR-600



SMR-600



Power Supply

Model	CFP-700	
Reference	4401	
Regulation type		switch mode
Mains supply voltage (50/60 Hz)	VAC	90 - 264
Outputs		+12 V (5A) → For ClassA modules +24 V (60 mA) → For Mast-Head Amplifiers +18 V (300 mA) +18 V / 22 kHz (300 mA) +13 V (300 mA) +13 V / 22 kHz (300 mA)
Max total currents of +24, +18 and +13 V	mA	700
Efficiency	%	75
Operating temperature	°C	-10 ... +55
Dimensions	mm	230 x 195 x 48

- Mains lead NOT INCLUDED. The module has a 3-pin european standard chassis plug, so the mains lead to be used must have a mating CEE 22 socket.
- Electrical safety protection level: Class II.
- 2 "banana" jumpers, 50 cm length, are supplied to pass the LNB remote powering voltage to 1 or 2 «SDC» receiver modules.

Others

Model	Ref.	Description
BAS-700	4403	Base-plate. Capacity: 7 modules (receivers and power supply). Dimensions: 441x257x24 mm.
BAS-900	4411	Base-plate. Capacity: 9 modules (receivers and power supply). Dimensions: 563x257x24 mm.
COF-700	4402	Housing for 1 BAS-700 base-plate. Dimensions: 430x341x258 mm. Indoor mounting. Metallic. Lock/key closing system.
CTF-175	1519	75Ω load plug. To load both input tap-line(s) and output coupling line in a SDC headend.
BUS-013		Local bus jumper to cascade the IKUSUP front panel sockets of the receiver modules (remote programming application). Length: 13 cm.
COR-220	3616	Europe Schuko mains lead. Cordset consist of 1.5 m of harmonised cable with a CEE 22 moulded socket on one end and a moulded plug on the other.
COR-230	4409	UK mains lead. Cordset consist of 1.5 m of harmonised cable with a CEE 22 moulded socket on one end and a moulded plug on the other.
COR-110	4408	USA mains lead. Cordset consist of 1.5 m of harmonised cable with a CEE 22 moulded socket on one end and a moulded plug on the other.
COR-240	4410	Australia mains lead. Cordset consist of 1.5 m of harmonised cable with a CEE 22 moulded socket on one end and a moulded plug on the other.
PMR-600	4416	Fixing-plate to fasten one ClassA module to the SMR-600 rack-frame. Six screws attached.
OMR-600	4417	6U - 12E (260x60mm) blank panel to fill the unoccupied places on the SMR-600 rack-frame. Four screws attached.
SMR-600	4407	Rack-frame for ClassA mountings, 6U height. Easy integration in standard 19" racks. Capacity: 7 modules. Screws are attached to fasten the PMR-600 fixing-plates. Packing dimensions: