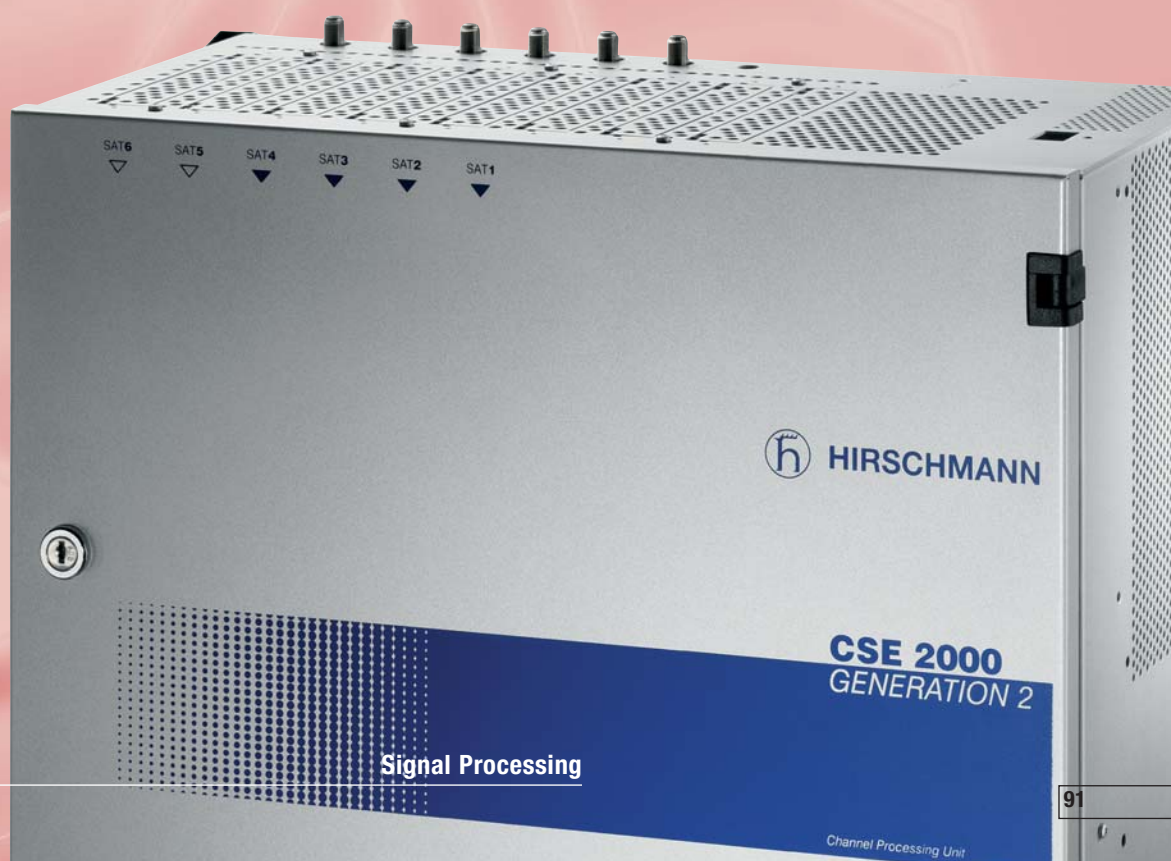


► Signal Processing

Page 91 – Page 118

Overview of headends	92
CDH 1000 Compact Digital Headend	93
CSE 2000 “Generation 2” headend system	104
CSE 6000 Semi-professional headend	117



Overview of headends

Three different headend variations for nearly every use - typical applications are shown in the overview

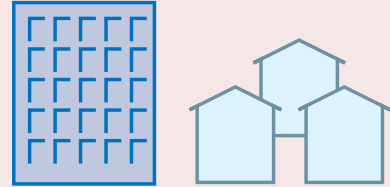
CDH 1000



Applications:

For up to approx. 200 subscribers
24 channels

- Small hotels
- Guesthouses
- Old people's homes
- Blocks of flats
- Terraced houses

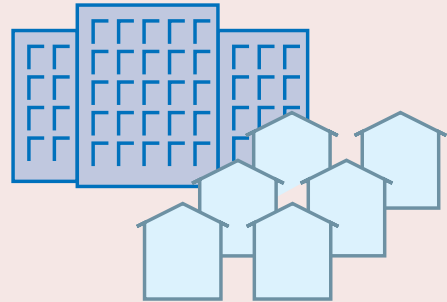


CSE 2000 Generation 2



For up to approx. 2.000 subscribers
80 channels

- Hotels
- Large blocks of flats
- Small residential areas
- CATV islands
- Additional programs

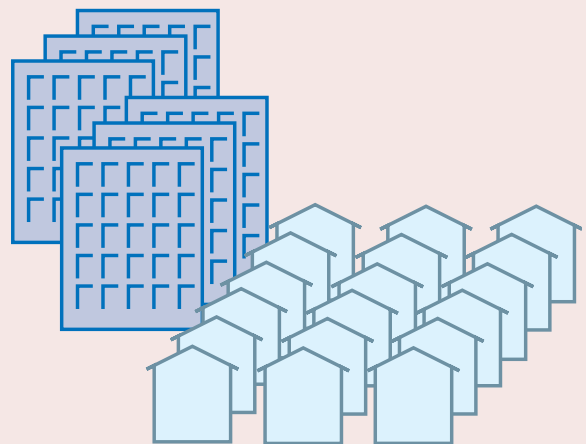


CSE 6000



For up to approx. 20.000 subscribers
80 channels

- Medium CATV installations
- Districts
- Towns



CDH 1000 Compact Digital Headend



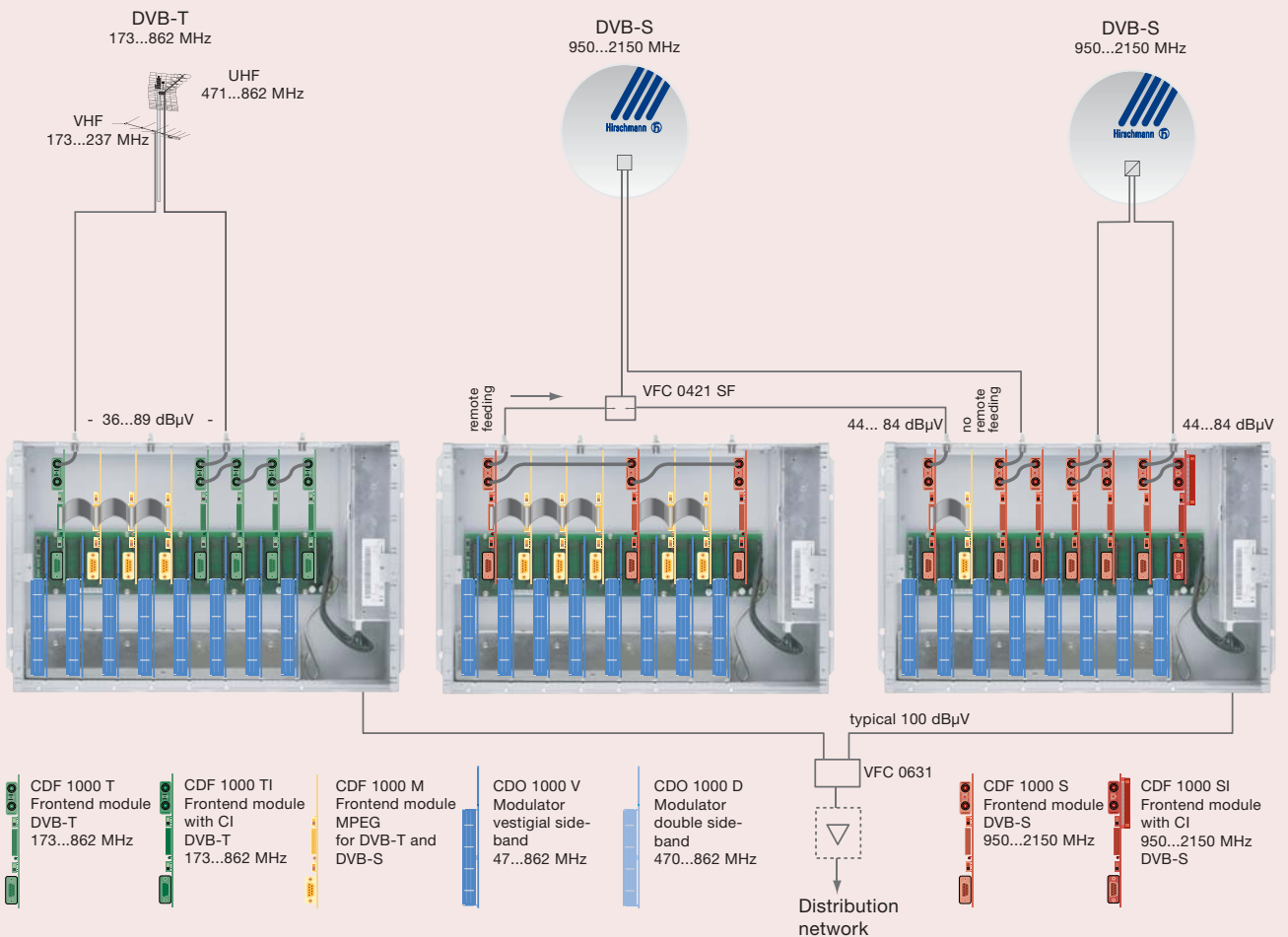
CDH 1000 is a compact headend in the new generation and is used to process digital TV and radio programs in accordance with the DVB-S and DVB-T standards.

The system features a compact design with up to 8 processing units per basic unit and very flexible configuration options. The programs can be transmitted over any existing building distribution network.

The subscribers do not require digital receivers; all existing televisions can continue to be used without conversion.

- For use in new and existing communal installations for 20 to 200 connections.
- Flexible configuration options - available as fully equipped unit or as individual components (basic unit, receiver modules and output modules can be configured as required)
- Master - Slave:
An efficient variant of the configuration options is the use of a receiver module as a "master" with looping through of the MPEG data stream to up to 7 slave modules CDF 1000 M.
- Further features
 - Simple programming of the individual modules using remote control and on-screen display
 - Programs that can be received: unencrypted (FTA) and encrypted (with CA module)
 - Automatic 16:9 switchover

Typical example system



CDH 1000 Base Unit

Type	CDH 1000
Order No.	940 059-001



Base unit for 8 channels (module pairs)

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Flexible configuration options available as fully equipped unit or as individual components (basic unit, input and output modules are freely configurable)



Base Unit	
Number of module pairs	8
RF connections	F (75 Ω)
Remote feeding current (total)	1 A
Output combining panel	
Frequency range	47 - 862 MHz
Gain	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV
Adjustable attenuator (total)	10 dB
Operating conditions	
Operating voltage	180-265 V, 47-63 Hz
Power consumption max.	110 W
Operating temperature	0° to 50°C
Mounting	19" / wall
Dimensions WxHxD	443x284x211 mm
Weight	6.7 kg
Weight with 8 module pairs	10.5 kg
Packing unit	
Box	1 unit
Included in delivery	4 F-F coaxial cables to connect SAT input to module input 1 ribbon cable to loop through the MPEG stream 1 power cord 1 remote control

CDH 1000 Complete Units

Type	CDH 1802 S	CDH 1802 SI
Order No.	940 064-001	940 063-001



Base Unit		
Number of module pairs	8	8
Frontend Modules	8 CDF 1000 S	8 CDF 1000 SI
Output Modulators	8 CDO 1000 D	8 CDO 1000 D
RF connections	F (75 Ω)	F (75 Ω)
Remote feeding current (total)	1 A	1 A
Common interfaces		8
Frontend Module		
Input frequency range	950 -2150 MHz	950 -2150 MHz
AFC	±4 MHz	±4 MHz
Input level	44-84 dBμV	44-84 dBμV
Modulation	QPSK	QPSK
Symbol rate	2-45 MSps	2-45 MSps
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Remote feeding voltage	14/ 18 V	14/ 18 V
Remote feeding current	400 mA	400 mA
Control of LNC output	0 / 22 kHz	0 / 22 kHz
Output Modulator		
Output frequency range	470 - 862 MHz	470 - 862 MHz
Output channels	C21 - C69	C21 - C69
Output level	82 dBμV	82 dBμV
Adjustable attenuator	10 dB	10 dB
Modulation	DSB - non-adjacent channel	DSB - non-adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone	Mono / stereo / 2-tone
TV standard	G, K, I	G, K, I
S/N weighted	56 dB	56 dB
Output combining panel		
Frequency range	47 - 862 MHz	47 - 862 MHz
Gain	20 dB	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV	104 dBμV
Adjustable attenuator (total)	10 dB	10 dB
Operating conditions		
Operating voltage	180-265 V, 47-63 Hz	180-265 V, 47-63 Hz
Operating temperature	0° to 45° C	0° to 45° C
Mounting	19" / wall	19" / wall
Dimensions WxHxD	443x284x211 mm	443x284x211 mm
Weight	6.7 kg	6.7 kg
Weight with 8 module pairs	10.5 kg	10.5 kg
Packing unit		
Box	1 unit	1 unit
Included in delivery	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control

The CDH 1000 compact digital headend processes TV and radio channels in accordance with the DVB-S and DVB-T standard. The system is characterized by its compact design with up to 8 processing channels per base unit and its very flexible configuration options. The output signals can be transmitted via any existing distribution network. Users do not need digital receivers; all existing television sets can be used with no need for conversion

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Fully equipped and configured unit


CDH 1802 S

SAT digital to PAL
8 channels
Non-adjacent channel mode

CDH 1802 SI

SAT digital to PAL
8 channels
Non-adjacent channel mode
Common interface

CDH 1000 Complete Units

Type	CDH 1801 S	CDH 1801 SI
Order No.	940 015-001	940 065-001



The CDH 1000 compact digital headend processes TV and radio channels in accordance with the DVB-S and DVB-T standard. The system is characterized by its compact design with up to 8 processing channels per base unit and its very flexible configuration options. The output signals can be transmitted via any existing distribution network. Users do not need digital receivers; all existing television sets can be used with no need for conversion

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Fully equipped and configured unit



CDH 1801 S

SAT digital to PAL
8 channels
Adjacent channel mode

CDH 1801 SI

SAT digital to PAL
8 channels
Adjacent channel mode
Common interface

Base Unit		
Number of module pairs	8	8
Frontend Modules	8 CDF 1000 S	8 CDF 1000 SI
Output Modulators	8 CDO 1000 V	8 CDO 1000 V
RF connections	F (75 Ω)	F (75 Ω)
Remote feeding current (total)	1 A	1 A
Common interfaces		8
Frontend Module		
Input frequency range	950 -2150 MHz	950 -2150 MHz
AFC	±4 MHz	±4 MHz
Input level	44-84 dBμV	44-84 dBμV
Modulation	QPSK	QPSK
Symbol rate	2-45 MSps	2-45 MSps
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Remote feeding voltage	14/ 18 V	14/ 18 V
Remote feeding current	400 mA	400 mA
Control of LNC output	0 / 22 kHz	0 / 22 kHz
Output Modulator		
Output frequency range	47 - 862 MHz	47 - 862 MHz
Output channels	C2 - C69	C2 - C69
Output level	90 dBμV	90 dBμV
Adjustable attenuator	20 dB	20 dB
Modulation	VSBS - adjacent channel	VSBS - adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone	Mono / stereo / 2-tone
TV standard	B/G, D/K, I, L	B/G, D/K, I, L
S/N weighted	56 dB	56 dB
Output combining panel		
Frequency range	47 - 862 MHz	47 - 862 MHz
Gain	20 dB	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV	104 dBμV
Adjustable attenuator (total)	10 dB	10 dB
Operating conditions		
Operating voltage	180-265 V, 47-63 Hz	180-265 V, 47-63 Hz
Operating temperature	0° to 45° C	0° to 45° C
Mounting	19" / wall	19" / wall
Dimensions WxHxD	443x284x211 mm	443x284x211 mm
Weight	6.7 kg	6.7 kg
Weight with 8 module pairs	10.5 kg	10.5 kg
Packing unit		
Box	1 unit	1 unit
Included in delivery	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control

CDH 1000 Complete Units

Type	CDH 1602 S	CDH 1132 S
Order No.	940 065-001	940 089-001



Base Unit		
Number of module pairs	6	4
Frontend Modules	6 CDF 1000 S	1 CDF 1000 S 3 CDF 1000 M
Output Modulators	6 CDO 1000 D	4 CDO 1000 D
RF connections	F (75 Ω)	F (75 Ω)
Remote feeding current (total)	1 A	1 A
Frontend Module		
Input frequency range	950 -2150 MHz	950 -2150 MHz
AFC	±4 MHz	±4 MHz
Input level	44-84 dBμV	44-84 dBμV
Modulation	QPSK	QPSK
Symbol rate	2-45 MSps	2-45 MSps
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Remote feeding voltage	14/ 18 V	14/ 18 V
Remote feeding current	400 mA	400 mA
Control of LNC output	0 / 22 kHz	0 / 22 kHz
Output Modulator		
Output frequency range	470 - 862 MHz	470 - 862 MHz
Output channels	C21 - C69	C21 - C69
Output level	82 dBμV	82 dBμV
Adjustable attenuator	10 dB	10 dB
Modulation	DSB - non-adjacent channel	DSB - non-adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone	Mono / stereo / 2-tone
TV standard	G, K, I	G, K, I
S/N weighted	56 dB	56 dB
Output combining panel		
Frequency range	47 - 862 MHz	47 - 862 MHz
Gain	20 dB	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV	104 dBμV
Adjustable attenuator (total)	10 dB	10 dB
Operating conditions		
Operating voltage	180-265 V, 47-63 Hz	180-265 V, 47-63 Hz
Operating temperature	0° to 45° C	0° to 45° C
Mounting	19" / wall	19" / wall
Dimensions WxHxD	443x284x211 mm	443x284x211 mm
Weight	6.7 kg	6.7 kg
Weight with 8 module pairs	10.5 kg	10.5 kg
Packing unit		
Box	1 unit	1 unit
Included in delivery	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control

The CDH 1000 compact digital headend processes TV and radio channels in accordance with the DVB-S and DVB-T standard. The system is characterized by its compact design with up to 8 processing channels per base unit and its very flexible configuration options. The output signals can be transmitted via any existing distribution network. Users do not need digital receivers; all existing television sets can be used with no need for conversion

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Fully equipped and configured unit


CDH 1602 S

SAT digital to PAL
6 channels
Non-adjacent channel mode

CDH 1132 S

SAT digital to PAL
4 channels; 1 master, 3 slave
Non-adjacent channel mode

CDH 1000 Complete Units

Type	CDH 1402 S
Order No.	940 088-001



The CDH 1000 compact digital headend processes TV and radio channels in accordance with the DVB-S and DVB-T standard. The system is characterized by its compact design with up to 8 processing channels per base unit and its very flexible configuration options. The output signals can be transmitted via any existing distribution network. Users do not need digital receivers; all existing television sets can be used with no need for conversion

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Fully equipped and configured unit



CDH 1402 S

SAT digital to PAL
4 channels
Non-adjacent channel mode

Base Unit	
Number of module pairs	4
Frontend Modules	4 CDF 1000 S
Output Modulators	4 CDO 1000 D
RF connections	F (75 Ω)
Remote feeding current (total)	1 A
Frontend Module	
Input frequency range	950 - 2150 MHz
AFC	±4 MHz
Input level	44-84 dBμV
Modulation	QPSK
Symbol rate	2-45 MSps
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8
Remote feeding voltage	14/ 18 V
Remote feeding current	400 mA
Control of LNC output	0 / 22 kHz
Output Modulator	
Output frequency range	470 - 862 MHz
Output channels	C21 - C69
Output level	82 dBμV
Adjustable attenuator	10 dB
Modulation	DSB - non-adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone
TV standard	G, K, I
S/N weighted	56 dB
Output combining panel	
Frequency range	47 - 862 MHz
Gain	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV
Adjustable attenuator (total)	10 dB
Operating conditions	
Operating voltage	180-265 V, 47-63 Hz
Operating temperature	0° to 45° C
Mounting	19" / wall
Dimensions WxHxD	443x284x211 mm
Weight	6.7 kg
Weight with 8 module pairs	10.5 kg
Packing unit	
Box	1 unit
Included in delivery	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control

CDH 1000 Complete Units

Type	CDH 1802 T	CDH 1801 T
Order No.	940 079-001	940 133-001



Base Unit		
Number of module pairs	8	8
Frontend Modules	8 CDF 1000 T	8 CDF 1000 T
Output Modulators	8 CDO 1000 D	8 CDO 1000 V
RF connections	F (75 Ω)	F (75 Ω)
Frontend Module		
Input frequency range	174-231+470-862 MHz	174-231+470-862 MHz
AFC	±4 MHz	±4 MHz
Input level	36-89 dBμV	36-89 dBμV
Modulation	COFDM	COFDM
COFDM spectrum	2k, 8k with QPSK / 16 QAM / 64 QAM	2k, 8k with QPSK / 16 QAM / 64 QAM
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Output Modulator		
Output frequency range	470 - 862 MHz	47 - 862 MHz
Output channels	C21 - C69	C2 - C69
Output level	82 dBμV	90 dBμV
Adjustable attenuator	10 dB	20 dB
Modulation	DSB - non-adjacent channel	VSF - adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone	Mono / stereo / 2-tone
TV standard	G, K, I	B/G, D/K, I, L
S/N weighted	56 dB	56 dB
Output combining panel		
Frequency range	47 - 862 MHz	47 - 862 MHz
Gain	20 dB	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV	104 dBμV
Adjustable attenuator (total)	10 dB	10 dB
Operating conditions		
Operating voltage	180-265 V, 47-63 Hz	180-265 V, 47-63 Hz
Operating temperature	0° to 45° C	0° to 45° C
Mounting	19" / wall	19" / wall
Dimensions WxHxD	443x284x211 mm	443x284x211 mm
Weight	6.7 kg	6.7 kg
Weight with 8 module pairs	10.5 kg	10.5 kg
Packing unit		
Box	1 unit	1 unit
Included in delivery	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control

The CDH 1000 compact digital headend processes TV and radio channels in accordance with the DVB-S and DVB-T standard. The system is characterized by its compact design with up to 8 processing channels per base unit and its very flexible configuration options. The output signals can be transmitted via any existing distribution network. Users do not need digital receivers; all existing television sets can be used with no need for conversion

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Fully equipped and configured unit


CDH 1802 T

Terrestrial digital to PAL
8 channels
Non-adjacent channel mode

CDH 1801 T

Terrestrial digital to PAL
8 channels
Adjacent channel mode

CDH 1000 Complete Units

Type	CDH 1262 T	CDH 1261 T
Order No.	940 078-001	940 078-001



The CDH 1000 compact digital headend processes TV and radio channels in accordance with the DVB-S and DVB-T standard. The system is characterized by its compact design with up to 8 processing channels per base unit and its very flexible configuration options. The output signals can be transmitted via any existing distribution network. Users do not need digital receivers; all existing television sets can be used with no need for conversion

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Fully equipped and configured unit



CDH 1262 T

Terrestrial digital to PAL
8 channels; 2 master, 6 slave
Non-adjacent channel mode

CDH 1261 T

Terrestrial digital to PAL
8 channels; 2 master, 6 slave
Adjacent channel mode

Base Unit		
Number of module pairs	8	8
Frontend Modules	2 CDF 1000 T 6 CDF 1000 M	2 CDF 1000 T 6 CDF 1000 M
Output Modulators	8 CDO 1000 D	8 CDO 1000 V
RF connections	F (75 Ω)	F (75 Ω)
Frontend Module		
Input frequency range	174-231+470-862 MHz	174-231+470-862 MHz
AFC	±4 MHz	±4 MHz
Input level	36-89 dBμV	36-89 dBμV
Modulation	COFDM	COFDM
COFDM spectrum	2k, 8k with QPSK / 16 QAM / 64 QAM	2k, 8k with QPSK / 16 QAM / 64 QAM
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Output Modulator		
Output frequency range	470 - 862 MHz	47 - 862 MHz
Output channels	C21 - C69	C2 - C69
Output level	82 dBμV	90 dBμV
Adjustable attenuator	10 dB	20 dB
Modulation	DSB - non-adjacent channel	VSB - adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone	Mono / stereo / 2-tone
TV standard	G, K, I	B/G, D/K, I, L
S/N weighted	56 dB	56 dB
Output combining panel		
Frequency range	47 - 862 MHz	47 - 862 MHz
Gain	20 dB	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV	104 dBμV
Adjustable attenuator (total)	10 dB	10 dB
Operating conditions		
Operating voltage	180-265 V, 47-63 Hz	180-265 V, 47-63 Hz
Operating temperature	0° to 45° C	0° to 45° C
Mounting	19" / wall	19" / wall
Dimensions WxHxD	443x284x211 mm	443x284x211 mm
Weight	6.7 kg	6.7 kg
Weight with 8 module pairs	10.5 kg	10.5 kg
Packing unit		
Box	1 unit	1 unit
Included in delivery	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control

CDH 1000 Complete Units

Type	CDH 1402 T	CDH 1132 T
Order No.	940 077-001	940 076-001



Base Unit		
Number of module pairs	4	4
Frontend Modules	4 CDF 1000 T	1 CDF 1000 T 3 CDF 1000 M
Output Modulators	4 CDO 1000 D	4 CDO 1000 D
RF connections	F (75 Ω)	F (75 Ω)
Frontend Module		
Input frequency range	174-231+470-862 MHz	174-231+470-862 MHz
AFC	±4 MHz	±4 MHz
Input level	36-89 dBμV	36-89 dBμV
Modulation	COFDM	COFDM
COFDM spectrum	2k, 8k with QPSK / 16 QAM / 64 QAM	2k, 8k with QPSK / 16 QAM / 64 QAM
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Output Modulator		
Output frequency range	470 - 862 MHz	470 - 862 MHz
Output channels	C21 - C69	C21 - C69
Output level	82 dBμV	82 dBμV
Adjustable attenuator	10 dB	10 dB
Modulation	DSB - non-adjacent channel	DSB - non-adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone	Mono / stereo / 2-tone
TV standard	G, K, I	G, K, I
S/N weighted	56 dB	56 dB
Output combining panel		
Frequency range	47 - 862 MHz	47 - 862 MHz
Gain	20 dB	20 dB
Output level max. (CSO, CTB 60 dB)	104 dBμV	104 dBμV
Adjustable attenuator (total)	10 dB	10 dB
Operating conditions		
Operating voltage	180-265 V, 47-63 Hz	180-265 V, 47-63 Hz
Operating temperature	0° to 45° C	0° to 45° C
Mounting	19" / wall	19" / wall
Dimensions WxHxD	443x284x211 mm	443x284x211 mm
Weight	6.7 kg	6.7 kg
Weight with 8 module pairs	10.5 kg	10.5 kg
Packing unit		
Box	1 unit	1 unit
Included in delivery	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control	2 F-F coaxial cables to upgrade SAT modules 1 power cord 1 remote control

The CDH 1000 compact digital headend processes TV and radio channels in accordance with the DVB-S and DVB-T standard. The system is characterized by its compact design with up to 8 processing channels per base unit and its very flexible configuration options. The output signals can be transmitted via any existing distribution network. Users do not need digital receivers; all existing television sets can be used with no need for conversion

- CDH 1000 base unit for 8 pairs of modules, consisting of input module and output modulator
- For use in new and existing networks for 20 to 200 connections
- Any combination of input modules and output modulators is possible for each pair of modules
- Master/slave. An efficient configuration version is the use of any input module as a "master", looping through the MPEG data stream to up to 7 CDF 1000 M slave modules
- Sturdy, screened metal housing
- Contains active output combiner
- Contains power supply unit for 8 channels and LNC supply
- Channel programming via remote control and on-screen display
- FTA and CI versions
- Automatic 16:9 switching
- Fully equipped and configured unit


CDH 1402 T

Terrestrial digital to PAL
4 channels
Non-adjacent channel mode

CDH 1132 T

Terrestrial digital to PAL
4 channels; 1 master, 3 slave
Non-adjacent channel mode

CDH 1000 Input Modules

Type	CDF 1000 S	CDF 1000 SI
Order No.	940 060-001	940 061-001



Input modules for CDH compact digital headend

- For receiving and converting digital signals to analog audio/video signals (internal interface)
- DVB-S- (SAT digital) and DVB-T- (terrestrial digital) versions
- FTA and CI versions
- Channel programming via remote control and on-screen display
- Input modules can be installed and combined with output modulators in any way
- The CDF 1000 M MPEG input module can be used as a slave for all other input modules
- TV and radio mode with automatic station display



CDF 1000 S

Input module for SAT digital

CDF 1000 SI

Input module for SAT digital with Common Interface

Frontend Module	CDF 1000 S	CDF 1000 SI
Input frequency range	950 -2150 MHz	950 -2150 MHz
AFC	±4 MHz	±4 MHz
Input level	44-84 dB μ V	44-84 dB μ V
Modulation	QPSK	QPSK
Symbol rate	2-45 MSps	2-45 MSps
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	1/2, 2/3, 3/4, 5/6, 7/8
Remote feeding voltage	14/ 18 V	14/ 18 V
Remote feeding current	400 mA	400 mA
Control of LNC output	0 / 22 kHz	0 / 22 kHz
Common interface		Yes
RF connections	F (75 Ω)	F (75 Ω)
Operating conditions		
Power consumption	6 W	7 W
Operating temperature	0° to 45° C	0° to 45° C
Mounting	Module for CDH 1000	Module for CDH 1000
Packing unit		
Box	1 unit	1 unit
Included in delivery	1 coaxial cable to loop through the modules.	1 coaxial cable to loop through the modules.

Type	CDF 1000 T	CDF 1000 M
Order No.	940 074-001	940 069-001



Input modules for CDH compact digital headend

- For receiving and converting digital signals to analog audio/video signals (internal interface)
- DVB-S- (SAT digital) and DVB-T- (terrestrial digital) versions
- FTA and CI versions
- Channel programming via remote control and on-screen display
- Input modules can be installed and combined with output modulators in any way
- The CDF 1000 M MPEG input module can be used as a slave for all other input modules
- TV and radio mode with automatic station display



CDF 1000 T

Input module for terrestrial digital (DVB-T)

CDF 1000 M

Input module with MPEG input. MPEG signal can be fed from DVB-S or DVB-T module.

Frontend Module	CDF 1000 T	CDF 1000 M
Input frequency range	174-231+470-862 MHz	MPEG data stream
AFC	±4 MHz	
Input level	36 -89 MHz	
Modulation	COFDM	
COFDM spectrum	2k, 8k with QPSK / 16 QAM / 64 QAM	
Viterbi code rate	1/2, 2/3, 3/4, 5/6, 7/8	
RF connections	IEC	
Operating conditions		
Power consumption	6 W	4 W
Operating temperature	0° to 45° C	0° to 45° C
Mounting	Module for CDH 1000	Module for CDH 1000
Packing unit		
Box	1 unit	1 unit
Included in delivery	1 coaxial cable to loop through the modules 1 F-IEC coaxial cable to connect the input.	

CDH 1000 Output Modulators

Type	CDO 1000 D	CDO 1000 V
Order No.	940 062-001	940 066-001



Output Modulator		
Output frequency range	470 - 862 MHz	47 - 862 MHz
Output channels	C21 - C69	C2 - C69
Output level	82 dB μ V	90 dB μ V
Adjustable attenuator	0...10 dB	0...20 dB
Modulation	DSB - non-adjacent channel	VSB - adjacent channel
Audio modes (standard B/G)	Mono / stereo / 2-tone	Mono / stereo / 2-tone
TV standard	G, K, I	B/G, D/K, I, L
S/N weighted	56 dB	56 dB
Operating conditions		
Operating temperature	0° to 45° C	0° to 45° C
Mounting	Module for CDH 1000	Module for CDH 1000
Packing unit		
Box	1 unit	1 unit

Output modulators for CDH 1000 compact digital headend

- For converting internal audio/video signals to multinorm TV signals
- Modulators can be mixed and combined with input modules in any way
- Mono/stereo or 2-channel sound
- Adjacent channel suitable VSB (vestigial sideband) and non-adjacent channel suitable DSB (double sideband) version



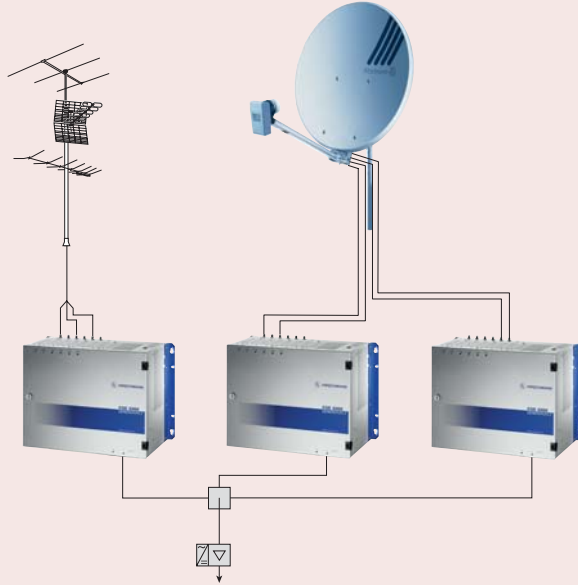
CDO 1000 D

Double sideband modulator, DSB, non-adjacent channel

CDO 1000 V

Vestigial sideband modulator, VSB, adjacent channel

CSE 2000 Generation 2 - the new generation of headends



With the CSE 2000 Generation 2 Hirschmann is offering a flexible, modular system in which analog and digital processing units complement each other ideally. CSE 2000 Generation 2 is the headend system that meets all today's requirements and leaves all options open for the future.

- The headend system with support for neighbouring channel operation is used for the reception and processing of analog and digital TV and radio programs, terrestrially or via satellite.
- The system comprises the basic unit with slots for 8 modules. A programmable distribution panel is integrated; this panel has six inputs and 16 outputs to the SAT modules; these outputs can be programmed as required.
- An integrated, ergonomic control unit permits common or individual programming of all modules.
- Multi-standard for international TV standards
- Additional audio/video modulators for injecting external signals
- Twin modules permit space-saving installations
- Neighbouring channel operation is possible without limitations with the system
- Can be programmed remotely
- The integrated output amplifier is also designed for larger networks
- Installation in 19" rack or wall mounting possible



CSE 2000 Generation 2

Overview of modules

CSE 2000 Generation 2 has the right module for every application



	Input		Output									
	Twin module	single module	SAT analogue	SAT digital	terrestrial analogue	terrestrial digital	FM	AV	PAL/SECAM	QAM	FM	AV
Base unit CSE 2000 Generation 2												
Base unit CSE 2000 M Generation 2												
SAT digital / PAL CHD 2022 S												
SAT digital / PAL CHD 2022 SI												
SAT digital / PAL CHD 2022 MI												
SAT analog / PAL CHS 2000 M												
SAT analog / PAL CHS 2000 S												
SAT analog / PAL CHS 2001 S												
SAT analog / PAL CHS 2001 M												
Terr. analog / PAL CHT 2000 T												
Terr. analog / PAL CHT 2000 M												
Terr. analog / PAL CHT 2000 B												
Terr. analog / PAL CHT 2001 T												
Terr. analog / PAL CHT 2001 M												
Terr. digital / PAL CHC 2022 S												
Terr. digital / PAL CHC 2022 SI												
Terr. digital / PAL CHC 2022 MI												
Terr. digital / PAL CDT 2000 S												
Terr. digital / PAL CDT 2000 SI												
Terr. digital / PAL CDT 2000 M												
Terr. digital / PAL CDT 2000 MI												
Modulator (PAL) CHM 2000 S												
Modulator (PAL) CHM 2000 M												
Modulator (PAL) CHM 2001 S												
Modulator (PAL) CHM 2001 M												
SAT digital / QAM CHD 2022 Q												
SAT digital / QAM CHD 2022 QN												
Terr. digital / QAM CHC 2022 QN												
Amplifier SAT/terr. / FM CHV 2000 U												
FM module ADR (SAT/terr) / FM CHA 2000 A												
FM module SAT/terr. / FM CHA 2000 U												
FM module SAT dig. / FM CHD 2022 U												

CSE 2000 Base Unit

Type	CSE 2000 Generation 2	CSE 2000 M Generation 2
Order No.	940 137-001	940 146-001



Base unit for installation of 8 single or twin modules

- Integrated programmable input distribution panel with 6 inputs and 16 programmable outputs
- Integrated ergonomic control unit with intuitive menu guidance and user friendly plain text display. With PC and remote control interface
- The integrated output amplifier is suitable for large networks
- Integrated power supply for 8 twin modules and LNC remote feeding
- Solid screened metal housing



CSE 2000 Generation 2

Complete basic unit

CSE 2000 M Generation 2

Basic unit without input distributor panel

- for modulators and terrestrial modules

Base Unit		
Module slots	8 (twin modules)	8 (twin modules)
Attenuation loop-through input	4 dB	4 dB
PC interface	RS 232	RS 232
Remote control interface	RJ 45 (RS 485)	RJ 45 (RS 485)
RF connections	F (75 Ω)	F (75 Ω)
Input distribution panel		
Input frequency range	950-2400 MHz	
Input Level	60-85 dBμV	
Module connections	16 (2 per module position)	
Inputs 5-6 can be distributed to modules 7,8		
Inputs 1-4 can be distributed to modules 1-8		
Inputs	6	
Remote feeding (inputs 1,3,5,6)	4x500 mA	
Remote feeding current	Max. 1A (total)	
Output amplifier		
Frequency range	47-862 MHz	47-862 MHz
Gain	28 dB	28 dB
Output level analog (16 channels)	104 dBμV	104 dBμV
Output level digital (16 channels)	104 dBμV	104 dBμV
Adjustable attenuator	0...20 dB	0...20 dB
Operating conditions		
Operating voltage	200 - 250 V, 50 - 60 Hz	200 - 250 V, 50 - 60 Hz
Power consumption	max. 160 W	max. 160 W
Operating temperature	0° to 50°C	0° to 50°C
Mounting	19" / wall	19" / wall
Dimensions WxHxD	484x358x221 mm	484x358x221 mm
Packing unit		
Box	1 unit	1 unit
Included in delivery	2 F-terminations 1 power cord	2 F-terminations 1 power cord

CSE 2000 Modules SAT Digital to PAL/SECAM

Type	CHD 2022 S	CHD 2022 SI	CHD 2022 MI
Order No.	940 141-101	940 144-101	940 145-101



Input			
Processed channels	2 (Twin)	2 (Twin)	2 (Twin)
Input frequency range	950 -2150 MHz	950 -2150 MHz	950 -2150 MHz
AFC	±4 MHz	±4 MHz	±4 MHz
Input level	47-70 dB μ V	47-70 dB μ V	47-70 dB μ V
Modulation	QPSK	QPSK	QPSK
Symbol rate	1-45 MS/s	1-45 MS/s	1-45 MS/s
RF connections	F (75 Ω) (internal)	F (75 Ω) (internal)	F (75 Ω) (internal)
Output			
Output level	90 dB μ V	90 dB μ V	90 dB μ V
Output frequency range	(47) 110-862 MHz	(47) 110-862 MHz	(45) 110-862 MHz
Adjustable attenuator	0...20 dB	0...20 dB	0...20 dB
TV standard	B/G (Stereo)	B/G (Stereo)	PAL D/K, I, SECAM L
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)
Operating conditions			
Power consumption	12 W	13 W	13 W
Operating temperature	0° to 50°C	0° to 50°C	0° to 50°C
Packing unit			
Box	1 unit	1 unit	1 unit
Included in delivery	1 HF cable for connecting the outputs	1 HF cable for connecting the outputs	1 HF cable for connecting the outputs

Modules for processing of digital SAT-IF signals to analog output signals

- Output signal adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Band I in single channel mode
- CI-type for 1 CA-module; two services of one data stream can be decrypted


CHD 2022 S

Twin module with stereo modulator (B/G)

CHD 2022 SI

CI twin module with stereo modulator (B/G)

CHD 2022 MI

CI twin module with multinorm modulator

CSE 2000 Modules SAT-TV Analog

Type	CHS 2000 S	CHS 2000 M	CHS 2001 S	CHS 2001 M
Order No.	960 899-101	960 898-101	961 106-101	961 107-101



Modules for processing of analog SAT-IF signals to analog output signals

- Twin and single modules
- Output signal adjacent channel compatible
- Twin modules with 2 adjacent output channels
- Optional audio/video interface (with CHE 2000 D)



CHS 2000 S

Twin module with stereo modulator (B/G)

CHS 2000 M

Twin module with multinorm modulator

CHS 2001 S

Single module with stereo modulator (B/G)

CHS 2001 M

Single module with multinorm modulator

Input				
Processed channels	2 (Twin)	2 (Twin)	1 (Single)	1 (Single)
Input frequency range	950-2150 MHz	950 -2150 MHz	950-2150 MHz	950-2150 MHz
AFC	±8 MHz	±8 MHz	±8 MHz	±8 MHz
Input level	47-70 dB μ V	47-70 dB μ V	47-70 dB μ V	47-70 dB μ V
RF connections	F (75 Ω) (internal)	F (75 Ω) (internal)	F (75 Ω) (internal)	F (75 Ω) (internal)
Audio / Video				
Video deviation selectable	16 / 22.5 MHz	16 / 22.5 MHz	16 / 22.5 MHz	16 / 22.5 MHz
Video polarity	neg. / pos.	neg. / pos.	neg. / pos.	neg. / pos.
Audio frequency	5.5-9.5 MHz	5.5-9.5 MHz	5.5-9.5 MHz	5.5-9.5 MHz
Output				
Output level	90 dB μ V	90 dB μ V	90 dB μ V	90 dB μ V
Output frequency range	110-862 MHz	110-862 MHz	47-862 MHz	45-862 MHz
Adjustable attenuator	0...20 dB	0...20 dB	0...20 dB	0...20 dB
TV standard	B/G (Stereo)	PAL D/K, I, SECAM L	B/G (Stereo)	PAL D/K, I, SECAM L
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)	F (75 Ω)
Operating conditions				
Power consumption	11.7 W	10.6 W	7.8 W	7.8 W
Operating temperature	0° to 50° C	0° to 50° C	0° to 50° C	0° to 50° C
Packing unit				
Box	1 unit	1 unit	1 unit	1 unit
Included in delivery	1 HF cable for connecting the outputs	1 HF cable for connecting the outputs	1 HF cable for connecting the outputs	1 HF cable for connecting the outputs

CSE 2000 Modules Terrestrial TV Digital to PAL

Type	CDT 2000 S	CDT 2000 SI	CDT 2000 M	CDT 2000 MI
Order No.	940 092-001	940 094-001	940 093-001	940 095-001



Input				
Processed channels	1 (Single)	1 (Single)	1 (Single)	1 (Single)
Input frequency range	950-2150 MHz	950-2150 MHz	950-2150 MHz	950-2150 MHz
AFC	±4 MHz	±4 MHz	±4 MHz	±4 MHz
Input level	30-80 dB μ V	30-80 dB μ V	30-80 dB μ V	30-80 dB μ V
Modulation	COFDM 2k, 8k	COFDM 2k, 8k	COFDM 2k, 8k	COFDM 2k, 8k
Symbol rate	2-35 MS/s	2-35 MS/s	2-35 MS/s	2-35 MS/s
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)	F (75 Ω)
Output				
Output frequency range	45-862 MHz	45-862 MHz	45-862 MHz	45-862 MHz
Output level	90 dB μ V	90 dB μ V	90 dB μ V	90 dB μ V
Adjustable attenuator	0...20 dB	0...20 dB	0...20 dB	0...20 dB
TV standard	PAL B/G (stereo)	PAL B/G (stereo)	PAL D/K, I; SECAM L	PAL D/K, I; SECAM L
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)	F (75 Ω)
Operating conditions				
Power consumption	13.5 W	14.5 W	13.5 W	14.5 W
Operating temperature	0° to 50° C	0° to 50° C	0° to 50° C	0° to 50° C
Packing unit				
Box	1 unit	1 unit	1 unit	1 unit
Included in delivery	1 cover (slot plate) with 1 F connection 1 HF cable for connecting the outputs	1 cover (slot plate) with 1 F connection 1 HF cable for connecting the outputs	1 cover (slot plate) with 1 F connection 1 HF cable for connecting the outputs	1 cover (slot plate) with 1 F connection 1 HF cable for connecting the outputs

Modules for processing of digital terrestrial signals to analog output signals

- Output signal adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Band 1 in single channel mode
- CI-type for 1 CA-module


CDT 2000 S

Single module with stereo modulator (B/G)

CDT 2000 SI

CI single module with stereo modulator (B/G)

CDT 2000 M

Single module with multinorm modulator

CDT 2000 MI

CI single module with multinorm modulator

CSE 2000 Modules Terrestrial TV Digital to PAL

Type	CHC 2022 S	CHC 2022 SI	CHC 2022 MI
Order No.	940 147-101	940 148-101	940 149-101



Modules for processing of digital terrestrial signals to analog output signals

- Output signal adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Band I in single channel mode
- CI-type for 1 CA-module



CHC 2022 S

Twin module with stereo modulator (B/G)

CHC 2022 SI

CI twin module with stereo modulator (B/G)

CHC 2022 MI

CI twin module with multinorm modulator

Input			
Processed channels	2 (Twin)	2 (Twin)	2 (Twin)
Input frequency range	174-230+470-862 MHz	174-230+470-862 MHz	174-230+470-862 MHz
AFC	±4 MHz	±4 MHz	±4 MHz
Input level	30-80 dB μ V	30-80 dB μ V	30-80 dB μ V
Modulation	COFDM 2k, 8k	COFDM 2k, 8k	COFDM 2k, 8k
Symbol rate	2-35 MS/s	2-35 MS/s	2-35 MS/s
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)
Output			
Output frequency range	(47) 110-862 MHz	(47) 110-862 MHz	(45) 110-862 MHz
Output level	90 dB μ V	90 dB μ V	90 dB μ V
Adjustable attenuator	0...20 dB	0...20 dB	0...20 dB
TV standard	B/G stereo	B/G stereo	PAL D/K, I; SECAM L
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)
Operating conditions			
Power consumption	12 W	12 W	13 W
Operating temperature	0° to 50° C	0° to 50° C	0° to 50° C
Packing unit			
Box	1 unit	1 unit	1 unit
Included in delivery	1 cover (slot plate) with 2 F connections 1 HF cable for connecting the outputs	1 cover (slot plate) with 2 F connections 1 HF cable for connecting the outputs	1 cover (slot plate) with 2 F connections 1 HF cable for connecting the outputs

CSE 2000 Modules Terrestrial TV Analog

Type	CHT 2000 T	CHT 2000 M
Order No.	960 903-101	960 973-101



Input		
Processed channels	2 (Twin)	2 (Twin)
Input frequency range	47-862 MHz	45-862 MHz
Input level	70-85 dB μ V	70-85 dB μ V
RF connections	F (75 Ω)	F (75 Ω)
Output		
Output level	90 dB μ V	90 dB μ V
Output frequency range	110-862 MHz	110-862 MHz
Adjustable attenuator	0...20 dB	0...20 dB
TV standard	B/G stereo	D/K, I, L
RF connections	F (75 Ω)	F (75 Ω)
Operating conditions		
Power consumption	7.2 W	7.2 W
Operating temperature	0° to 50° C	0° to 50° C
Packing unit		
Box	1 unit	1 unit
Included in delivery	1 cover (slot plate) with 2 F connections 1 HF cable for connecting the outputs	1 cover (slot plate) with 2 F connections 1 HF cable for connecting the outputs

Modules for processing of analog terrestrial signals to analog output signals

- Twin and single modules
- Output signal adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Automatic gain control (AGC)



CHT 2000 T

Twin module with stereo modulator (B/G)

CHT 2000 M

Twin module with multinorm modulator

CSE 2000 Modules Terrestrial TV Analog

Type	CHT 2001 T	CHT 2001 M	CHT 2000 B
Order No.	961 104-101	961 105-101	960 911-101



Modules for processing of analog terrestrial signals to analog output signals

- Twin and single modules
- Output signal adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Automatic gain control (AGC)



CHT 2001 T

Single module with stereo modulator

CHT 2001 M

Single module with multinorm modulator

CHT 2000 B

Single module with multinorm modulator for Band I and III

Input			
Processed channels	1 (Single)	1 (Single)	1 (Single)
Input frequency range	47-862 MHz	45-862 MHz	45-862 MHz
Input level	70-85 dB μ V	70-85 dB μ V	70-85 dB μ V
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)
Output			
Output level	90 dB μ V	90 dB μ V	90 dB μ V
Output frequency range	110-862 MHz	110-862 MHz	45-470 MHz
Adjustable attenuator	0...20 dB	0...20 dB	0...20 dB
TV standard	B/G stereo	D/K, I, L	D/K, I, L (B/G stereo)
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)
Operating conditions			
Power consumption	3.8 W	3.8 W	3.8 W
Operating temperature	0° to 50° C	0° to 50° C	0° to 50° C
Packing unit			
Box	1 unit	1 unit	1 unit
Included in delivery	1 cover (slot plate) with 1 F connection 1 HF cable for connecting the outputs	1 cover (slot plate) with 1 F connection 1 RF cable for connecting the outputs	1 cover (slot plate) with 1 F connection 1 HF cable for connecting the outputs

CSE 2000 Modules Audio/Video Modulator

Type	CHM 2000 S	CHM 2000 M	CHM 2001 S	CHM 2001 M
Order No.	960 912-101	960 913-101	961 108-101	961 109-101



Input	CHM 2000 S	CHM 2000 M	CHM 2001 S	CHM 2001 M
Processed channels	2 (Twin)	2 (Twin)	1 (Single)	1 (Single)
Audio / Video				
Video bandwidth	20 Hz-5 MHz	20 Hz-5 MHz	20 Hz-5 MHz	20 Hz-5 MHz
Audio signal	Stereo, 2-tone, mono	Mono	Stereo, 2-tone, mono	Mono
Video input level	1V _{SS}	1 V _{eff}	1 V _{eff}	1 V _{eff}
Audio input level	0.5 V RMS (10 kΩ)	0.5 V RMS (10 kΩ)	0.5 V RMS (10 kΩ)	0.5 V RMS (10 kΩ)
Audio bandwidth	40 Hz-15 kHz	40 Hz-15 kHz	40 Hz-15 kHz	40 Hz-15 kHz
Output				
Output level	90 dB _μ V	90 dB _μ V	90 dB _μ V	90 dB _μ V
Output frequency range	110-862 MHz	110-862 MHz	110-862 MHz	110-862 MHz
Adjustable attenuator	0...20 dB	0...20 dB	0...20 dB	0...20 dB
TV standard	B/G stereo	D/K, I, L	B/G stereo	D/K, I, L
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)	F (75 Ω)
Operating conditions				
Power consumption	7.3 W	6.3 W	6.0 W	5.8 W
Operating temperature	0° to 50° C	0° to 50° C	0° to 50° C	0° to 50° C
Packing unit				
Box	1 unit	1 unit	1 unit	1 unit
Included in delivery	1 CHE 2000 D decoder interface 1 HF cable for connecting the outputs	1 CHE 2000 D decoder interface 1 HF cable for connecting the outputs	1 CHE 2000 D decoder interface 1 HF cable for connecting the outputs	1 CHE 2000 D decoder interface 1 HF cable for connecting the outputs

Modules for processing of audio/video signals to analog output signals

- Twin and single modules
- Output single adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Integrated audio/video interface - CHE 2000 D included



CHM 2000 S

Twin module with stereo modulator (B/G)

CHM 2000 M

Twin module with multinorm modulator

CHM 2001 S

Single module with stereo modulator (B/G)

CHM 2001 M

Single module with multinorm modulator

CSE 2000 Accessories

Type	CHE 2000 D
Order No.	960 901-101



Operating conditions	
Function with module type	analog
Interface for following modules	CHA 2000 A CHS ... CHM ... (included in CHM ...)
Packaging	1 unit

- For analog modules
- Input and output for video and audio signals via a 15-pin Submin-D socket for each channel
- For connecting signal decoders
- For feeding video and audio signals to the system
- 12 V forced switching possible



CSE 2000 Modules SAT-TV Digital to QAM

Type	CHD 2022 Q	CHD 2022 QN
Order No.	960 897-101	940 150-101



Modules for processing digital SAT-IF signals (DVB-S) to digital output signals (QAM)

- Output signal adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Processing of data stream (NIT) and stuffing possible (CHD 2022 QN)



CHD 2022 Q

Twin module with QAM modulator

CHD 2022 QN

Twin module with QAM modulator

- Data stream processing (NIT) and stuffing

Input		
Processed channels	2 (Twin)	2 (Twin)
Input frequency range	950-2150 MHz	950-2150 MHz
AFC	±4 MHz	±4 MHz
Input level	47-70 dB μ V	47-70 dB μ V
Modulation	QPSK	QPSK
Symbol rate	1-45 MS/s	1-45 MS/s
RF connections	F (75 Ω)	F (75 Ω)
Output		
Output level	90 dB μ V	90 dB μ V
Output frequency range	110-862 MHz	110-862 MHz
Adjustable attenuator	0...20 dB	0...20 dB
Modulation	16-256 QAM	16-256 QAM
Symbol rate	7.0 MS/s max	7.0 MS/s max
RF connections	F (75 Ω)	F (75 Ω)
Operating conditions		
Power consumption	11 W	11 W
Operating temperature	0° to 50° C	0° to 50° C
Packing unit		
Box	1 unit	1 unit
Included in delivery	1 HF cable for connecting the outputs	1 HF cable for connecting the outputs

CSE 2000 Modules Terrestrial TV Digital to QAM

Type	CHC 2022 QN
Order No.	940 150-101



Input	
Processed channels	2 (Twin)
Input frequency range	174-230+470-862 MHz
AFC	±4 MHz
Input level	30-80 dB μ V
Modulation	COFDM 2k, 8k
Symbol rate	2 -35 MS/S
RF connections	F (75 Ω)
Audio / Video	
Audio frequency	110-862 MHz
Output	
Output level	90 dB μ V
Output frequency range	0...20 dB
Modulation	16-256 QAM
Symbol rate	7.0 MS/s max
RF connections	F (75 Ω)
Operating conditions	
Power consumption	11 W
Operating temperature	0° to 50° C
Packing unit	
Box	1 unit
Included in delivery	1 cover (slot plate) with 2 F connections 1 HF cable for connecting the outputs

Modules for processing digital terrestrial signals (DVB-T) to digital output signals (QAM)

- Output signal adjacent channel compatible (VSB)
- Twin modules with 2 adjacent output channels
- Processing of data flow (NIT) and stuffing possible



Twin module with QAM modulator

- Data flow processing (NIT) and stuffing

CSE 2000 Modules FM

Type	CHA 2000 A	CHA 2000 U	CHV 2000 U	CHD 2022 U
Order No.	960 905-101	960 906-101	960 904-101	940 161-101



Modules for processing of analog and digital signals to FM



CHA 2000 A

Analog SAT twin module with FM modulator

- Processes analog and digital subcarriers (ADR)
- Generates RDS signal
- External audio signal feed with CHE 2000 D possible

CHA 2000 U

Twin module with FM converter

- Common channel service possible
- Automatic gain control (AGC)

CHV 2000 U

FM amplifier module

- Six configurable rejection filters
- Two rejection filters can be set to the same frequency to increase attenuation

CHD 2022 U

Digital SAT twin module with FM modulator

Input				
Processed channels	2 (Twin)	2 (Twin)	-	2 (Twin)
Input frequency range	950-2150 MHz	87.5-108 MHz	87.5-108 MHz	950-2150 MHz
AFC				±4 MHz
Input level	47-70 dB μ V	53-99 dB μ V		47-70 dB μ V
Modulation				QPSK
Symbol rate				1-45 MS/s
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)	F (75 Ω)
Audio / Video				
Analog subcarrier	6-9 MHz			
ADR subcarrier	0.18-9 MHz			
Gain			34 dB	
Noise figure			3 dB	
Reduction per trap			14 dB	
Output				
Output level	91 dB μ V	91 dB μ V	91 dB μ V	91 dB μ V
Output frequency range	87.5-108 MHz	87.5-108 MHz	87.5-108 MHz	87.5-108 MHz
Adjustable attenuator	0 ... 20 dB	0 ... 20 dB	0 ... 20 dB	0 ... 20 dB
RF connections	F (75 Ω)	F (75 Ω)	F (75 Ω)	F (75 Ω)
Operating conditions				
Power consumption	8 W	1.9 W	1.5 W	10 W
Operating temperature	0° to 50° C	0° to 50° C	0° to 50° C	0° to 50° C
Packing unit				
Box	1 unit	1 unit	1 unit	1 unit
Included in delivery	1 HF cable for connecting the outputs	1 cover (slot plate) with 2 F connections 1 HF cable for connecting the outputs	1 cover (slot plate) with 1 F connection 1 HF cable for connecting the outputs	1 HF cable for connecting the outputs

CSE 6000 – the semi-professional headend



The CSE 6000 headend station is used in medium size cable networks with these functions:

- Suitable for adjacent channel operation for modern CATV system with a large number of channels
- Very userfriendly due to standardized interfaces (all inputs and outputs in F-system, RJ 45 as remote control interface)
- Straightforward and quick installation, as well as commissioning (programming of all modules using a central RJ 45 interface)
- High performance (output level, S/N, etc.)
- Best heat dissipation guarantees reliable operation
- All input and output interfaces are as standard of 75 Ω impedance
- For the TV standards B/G, D/K
- RF output frequency range up to 862 MHz
- One 19"/8HE frame can be fitted with up to 16 program processing cassettes
- Per 19" cabinet 40 analog satellite programs can be processed
- Software configuration of a maximum of 240 assemblies is possible

The CSE 6000 headend station system provides the complete range of components for analog and digital processing. The system is characterized by its modular design, flexible configuration features, the open interface concept and the usage of a headend station management system. In this way the CSE 6000 can not only be set up as a complete system, but can also be integrated in existing headend stations.

For the complete headend station system incl. technical parameters please request the separate brochure

CSE 6000 – the semi-professional headend

Overview of modules

CSE 6000 has the right module for every application.

The following channel groups are available on the output of the PAL/SECAM modules:

Band I	45...75 MHz
Band II	75...100 MHz
USB	110...174 MHz
Band III	174...230 MHz
OSB	230...300 MHz
ESB	300...470 MHz
Band IV	470...606 MHz
Band V	606...862 MHz

	Input							Output						
	SAT analogue	SAT digital	terrestrial analogue	terrestrial digital	QAM IF	QAM	FM	A/V	PAL B/G	PAL d/K	QAM IF	QAM	FM	A/V
CHS 60XX S Analog SAT Signal Processing B/G	■								■					
CHS 60XX SD – with CI Analog SAT Signal Processing B/G	■								■					
CHS 60XX O Analog SAT Signal Processing D/K	■								■					
CHS 60XX OD – with CI Analog SAT Signal Processing B/G	■								■					
CHF 6020 A SAT analog - FM	■												■	
CHT 60XX P QPSK - PAL/SECAM B/G		■							■					
CHT 60XX PO QPSK - PAL/SECAM D/K		■							■					
CHT 60XX Q DVB Transmod. QPSK - QAM IF		■								■				
CHF 6020 D SAT digital - FM		■											■	
CHT 6000 PCI QPSK - A/V with CI		■												■
CHD 6000 CATV - A/V			■											■
CHD 6X00 F Terr. (with filter) - A/V			■											■
CHD 60XX COFDM - PAL B/G				■					■					
CHC 60XX Q IF Converter QAM					■						■			
CHD 61XX QAM - PAL B/G						■			■					
CHF 60XXX FM Processor							■						■	
CHM 60XX A/V - PAL B/G								■						
CHM 60XX O A/V - PAL D/K								■						
CHG 60XX Pilot generator								■	■					