

# Table of Contents

## Fiber Series

P. 1

### FRM220 Family

FRM220-CH20	2U In-band Managed 20 Slot Chassis	1
FRM220-CH01	Stand-alone One Slot Chassis	2
FRM220 Overview	Slide-in Card Overview	3
FRM220-10/100I	Fast Ethernet In-band Media Converter	5
FRM220-10/100I-2	Dual Channel Fast Ethernet In-band Media Converter	6
FRM220-10/100A	Fast Ethernet OAM/IP In-band Media Converter	7
FRM220-10/100A-2	Dual Channel Fast Ethernet OAM/IP In-band Media Converter	8
FRM220-1000ES	Managed Gigabit Ethernet Converter	9
FRM220-1000ES-1	Managed Gigabit Ethernet Converter	9
FRM220-1000EDS	Dual Channel Managed Gigabit Ethernet Converter	10
FRM200-1000EAS-1	Gigabit Ethernet OAM/IP In-band Converter	11
FRM220-1000EAS-2F	Dual Fiber Gigabit Ethernet OAM/IP In-band Converter	11
FRM220-100EAS	Gigabit Ethernet OAM/IP In-band Converter/Switch	12
FRM220-E1/T1	E1/T1 Fiber Converter	13
FRM220-Data	V35/X21/RS530/449/232 Fiber Converter	14
FRM220-Serial	RS485/422/232 Fiber Converter	15
FRM220-FXO/FXS	POTS 2-wire Fiber Converter	16
FRM220-155MS	STM1 Repeater, Multimode/Single mode Converter	17
FRM220-SML80-3R	3R 2.5G Fiber Transponder	18



### FRM301 Family

FRM301-CH	3U Managed 16 Slot Chassis	19
FRM301 Overview	Slide-in Card Overview	20
FRM301-10/100F	Fast Ethernet Fiber Converter Slide-in Card	21
FIB1-10/100F	Fast Ethernet Fiber Converter	21
FIB2-10/100F	Fast Ethernet Fiber Converter w/ Built-in Power	21
FRM301-1000ES	Gigabit Ethernet Fiber Converter Slide-in Card	22
FIB1-1000ES	Gigabit Ethernet Fiber Converter	22
FRM301-1000TS	Gigabit Ethernet Fiber Converter Slide-in Card	23
FIB1-1000TS	Gigabit Ethernet Fiber Converter	23
FRM301-1000TG	Gigabit Ethernet Fiber Converter Slide-in Card	23
FIB1-1000TG	Gigabit Ethernet Fiber Converter	23
FIB2-1000TG	Gigabit Ethernet Fiber Converter w/ Built-in Power	23
FRM301-1000MG	Gigabit Ethernet Fiber Converter Slide-in Card	24
FIB1-1000MG	Gigabit Ethernet Fiber Converter	24
FRM301-1000DS	Gigabit Ethernet Fiber Converter Slide-in Card	25
FIB1-1000DS	Gigabit Ethernet Fiber Converter	25
FRM301-E1/T1	E1/T1 Fiber Converter Slide-in Card	26
FIB1-E1/T1	E1/T1 Fiber Converter	26
FIB2-E1/T1	E1/T1 Fiber Converter w/ Built-in Power	26
FRM301-Data	V35/X21/RS530/449/232 Fiber Converter Slide-in Card	27
FIB1-Data	V35/X21/RS530/449/232 Fiber Converter	27
FIB2-Data	V35/X21/RS530/449/232 Fiber Converter w/ Built-in Power	27
FRM301-Serial	RS485/422/232 Fiber Converter Slide-in Card	28
FIB1-Serial	RS485/422/232 Fiber Converter	28
FIB2-Serial	RS485/422/232 Fiber Converter w/ Built-in Power	28
FIB1-Serial/FDC	RS485/422/232 Fiber Converter, Daisy Chain / Ring	29
OF10G-01S	10G Ethernet Fiber Converter	30



### FRM401 Family

FRM401-CH	4U Managed 12 Slot Chassis	31
FRM401-10/100	4 Channel Fast Ethernet Converter Card	32



### FMC Fiber Media Converter Family

FMC-CH08	2U Non-managed 8 Slot Chassis	33
FMC-CH16	2U Non-managed 16 Slot Chassis	33
FMC	FMC Converters Overview	34
FMC-10/100	Fast Ethernet Fiber Converter	35
FMC-10/100P	Fast Ethernet Fiber Converter w/ Power Over Ethernet	35
FMC-10/100i	Fast Ethernet In-band Managed Fiber Converter	36
FMC-10/100IP	Fast Ethernet In-Band Fiber Converter w/ Power Over Ethernet	36
FMC-10/100iS	Fast Ethernet In-band Managed Fiber Converter, SFP	36
FMC-1000E	Gigabit Ethernet Fiber Converter	37
FMC-1000ES	Gigabit Ethernet Fiber Converter, SFP	37
FMC-10/100POF	Fast Ethernet Fiber Converter for Plastic Optical Fiber	38

## Fiber Series

### Wall Mount Non-managed Fiber Converters

FRM402-CH	4U Non-managed 16 Slot Chassis	39
FRM402-10/100	4 Channel Fast Ethernet Fiber Converter Slide-in Card	39
FRM402-1000	2 Channel Gigabit Ethernet Fiber Converter Slide-in Card	39
FRM402-Serial	2 Channel RS485/422/232 Fiber Converter Slide-in Card	39
FWM-10/100	Fast Ethernet Fiber Converter, In-wall Mount	40
FWM-1000	Gigabit Ethernet Fiber Converter, In-wall Mount	40
FWM-Serial	RS485/422/232 Fiber Converter, In-wall Mount	40



### Ethernet Fiber Switches

FSW2104	Non-managed 4 Port Fast Ethernet Switch plus Fiber	41
FSW2202	Non-managed 2 Port Fast Ethernet Switch plus 2 port Fiber	42
FSW-2204	Non-managed 4 Port Fast Ethernet Switch plus 2 port Fiber	42



### Fiber Integrated Access Device

GW421FW	Fiber IAD Gateway with Wi-Fi	43
GW412F	Fiber IAD Gateway	43

### Managed Fiber Optical Multiplexers

FMUX01A	16 Channel E1/T1, Data, Ethernet Multiplexer	45
FMUX01A/Plus	16 Channel E1/T1, Data, Voice Plus 100M Ethernet Multiplexer	47
FMUX04	4 Channel E1/T1 Multiplexer	49

### Managed SDH Multiplexer

SDH01A	1U 4Slot STM-1 Add-Drop Multiplexer	50
--------	-------------------------------------	----

### CWDM Family

SML-1000	1U Non-Managed 4 Channel Transponder	51
SML-5000	5U Managed 17 Slot Chassis	52
SML-2000	2U Managed 6 Slot Chassis	52
SML-50-8011	Single Channel 1.25G Transponder	53
SML-50-8012	Dual Channel 1.25G Transponder	53
SML-50-8021	Single Channel 2.5G Transponder	53
SML-50-8022	Dual Channel 2.5G Transponder	53
SML-50-8181	9 Channel MUX/DEMUX	53
SLM-50-8151	5 Channel MUX/DEMUX	53
SML-50-8210	Optical Line Protection	54
SML-50-8301	Optical Add-Drop Multiplexer	54



### Multimedia Fiber Extender

DVI-F	Digital Visual Interface over fiber	55
HDMI-F	High-Definition Multimedia Interface over fiber	56

### Fiber Transceiver Module

SFP	Fiber Transceiver Modules for OC3, GbE, BiDI and CWDM	57
GBIC	Fiber Transceiver Modules for Gigabit Ethernet	57

### Fiber Patch cords

FCP/FCP-MS5-1M	Various Fiber Patch Cables with Standard Connectors	59
----------------	---	----

### Fiber Attenuator

FA-IS-PCS01	In-line Fiber Attenuators in Standard and Custom Values	60
-------------	---	----

# Table of Contents



## xDSL Series

P. 63

### G.SHDSL.bis TDM

SHRM03b-CH	4U Managed 16 Slot G.SHDSL.bis TDM Chassis	63
SHRM03b TDM Cards	Slide-in Card options for SHRM03b TDM Chassis	64
SHDTU03b-E1	2-wire (5.7Mbps) G.SHDSL.bis TDM (E1) CPE Modem	65
SHDTU03b-E1	4-wire (11.4Mbps) G.SHDSL.bis TDM (E1) CPE Modem	65
SHDTU03b-V35	2-wire (5.7Mbps) G.SHDSL.bis TDM (V35) CPE Modem	66
SHDTU03b-V35	4-wire (11.4Mbps) G.SHDSL.bis TDM (V35) CPE Modem	66
SHDTU03b-ET100	2-wire (5.7Mbps) G.SHDSL.bis TDM (Bridge) CPE Modem	67
SHDTU03bA-ET100	4-wire (11.4Mbps) G.SHDSL.bis TDM (Bridge) CPE Modem	67
SHDTU03b-31	2-wire (5.7Mbps) G.SHDSL.bis TDM (3-in-1) CPE Modem	68
SHDTU03bA-31	4-wire (11.4Mbps) G.SHDSL.bis TDM (3-in-1) CPE Modem	68



### G.SHDSL.bis ATM

SHRM03b-CH	4U Managed 16 Slot G.SHDSL.bis ATM Chassis	69
SHRM03b ATM Cards	Slide-in Card options for SHRM03 ATM Chassis	70
SHDTU03b-ET10R	Single Port, 2-wire (5.7Mbps) G.SHDSL.bis ATM Bridge/Router	71
SHDTU03b-ET10RS	4 Port, 2-wire (5.7Mbps) G.SHDSL.bis ATM Bridge/Router/Firewall	71
SHDTU03Ab-ET10RS	4 Port, 4-wire (11.4Mbps) G.SHDSL.bis ATM Bridge/Router/Firewall	71



### G.SHDSL TDM

SHRM03-CH	4U Managed 12 Slot G.SHDSL TDM Chassis	73
SHRM03 TDM Cards	Slide-in Card options for SHRM03 TDM Chassis	74
SHDTU03-E1	2-wire (2.3Mbps) G.SHDSL TDM (E1) CPE Modem	75
SHDTU03-V35	2-wire (2.3Mbps) G.SHDSL TDM (V35) CPE Modem	76
SHDTU03-ET100	2-wire (2.3Mbps) G.SHDSL TDM (Bridge) CPE Modem	77



### G.SHDSL ATM

SHRM03-CH	4U Non-managed 12 Slot G.SHDSL ATM Chassis	78
SHRM03-ET100R	2 channel G.SHDSL ATM Bridge/Router Slide-in Card	79
SHDTU03-ET10R	Single Port, 2-wire (2.3Mbps) G.SHDSL ATM Bridge/Router	80
SHDTU03-ET10RS	4 Port, 2-wire (2.3Mbps) G.SHDSL ATM Bridge/Router/Firewall	80
SHDTU03Ab-ET10RS	4 Port, 4-wire (4.6Mbps) G.SHDSL ATM Bridge/Router/Firewall	80



### ADSL

MD15	1.5U 24/48 Port Managed IP DSLAM	81
MD20	2U 24/48/72 Port Managed IP DSLAM	82
ATU-R160-4	4 port ADSL2+ Modem	83
ATU-R160-1	Single Port ADSL2+ Modem plus USB	83



### ADSL Splitter

ALS-R50	5U, 16 Slot, 384 Loop (24x16) Central Office ADSL Splitter Rack	84
ALS-R60	8U, 20 Slot, 640 Loop (32x20) Central Office ADSL Splitter Rack	85
ALS-12	CPE ADSL Splitter	86
ALS-M12	CPE ADSL Micro-Filter	86
ALS-P10	CPE ADSL Splitter, MDF Type	87
ALS-10-IT/UK/FI/FA	CPE ADSL Splitter, International Types	88
ALS-10-EU/I	CPE ADSL Splitter for ADSL over ISDN	89



### VDSL

VDTU2-104	VDSL2 CO Modem	90
VDTU2-204	VDSL2 CPE Modem	90

## PDH Series

P. 91

ERM01	4U 12 Slot Managed E1 Concentrator	91
ERM01 Overview	Slide-in Card options for ERM01	92

### Single Port E1 Access Uni

ETU01A	Single Modular Port E1 CSU/DSU w/ LCD & SNMP	93
ETU01A-AD	Single Modular Port E1 CSU/DSU w/ LCD & SNMP, Dual Power	93
ETU01	Single Modular Port E1 CSU/DSU	94
ETU01U	Single Modular Port Unframed E1 CSU/DSU	95
ETU/TTU	Interface Modules for ETU and TTU Family Access Units	96
Eoe1A	Ethernet over Unframed E1, Manageable	97
Eoe1	Ethernet over Unframed	98
G.703-FE1	Single Port E1 CSU/DSU	99
G.703-E1U	Single Port Unframed E1 CSU/DSU	100





## PDH Series

### Managed Voice & Data E1 Multiplexer

ERM-MUX-PLUS	4U, 10 I/O Slot Data, Ethernet, Voice E1 Managed Multiplexer	101
ERM-MUX-Plus Overview	Slide-in Card Options for ERM-MUX-Plus	102
ETU02-MUX-Plus	1U, 3 I/O Slot Data, Ethernet, Voice E1 Managed Multiplexer	104

### E1 Multi-Data Port Multiplexers w/ Sub E1

ETU02-MUX/AD	1U, 2/4 Modular Data Port E1 Multiplexer w/ LCD, Dual Power	106
ETU02-MUX	1U, 2/4 Modular Data Port E1 Multiplexer w/ LCD	106
ETU02A-MUX	1U, 2/4 Fixed Data Port E1 Multiplexer	107
ETU01-MUX/AD	1 Modular Port + Ethernet Bridge E1 Multiplexer /w LCD, Dual Power	108

### Inverse E1 Multiplexer

ERM04	4U, 12 Slot, Ethernet over 4xE1 Inverse E1 Multiplexer Rack	109
ETU04A	Ethernet over 4xE1 Inverse Multiplexer	110

### DXC

#### DXC Concentrator

ERM-DXC	4U, 11 I/O Slot E1 Digital Cross Connect Concentrator Rack	111
ERM-DXC Overview	Slide-in Card Options for ERM-DXC	112

#### DXC Multiplexer

ETU-DXC	1U, 8/16 Channel E1 Digital Cross Connect	113
---------	---	-----

### TDM over IP

IPM-1SE	Single E1/T1/J1 over Ethernet (IP)	114
---------	------------------------------------	-----

### G.703 Co-directional 64K Concentrator

G703/64-RM	4U 12 Slot Managed G.703 64Kbps Co-directional Concentrator rack 115	115
G703/64-RM Overview	Slide-in Card Options for G703/64-RM	116

### Single G.703 Co-directional 64K Access Unit

G703/64A-STD	G.703 64Kbps Co-directional to V35/RS530/449/232/X21	117
--------------	--	-----

### Compact, Stand-alone, Single G.703 Co-directional 64K Access Unit

G703/64A	G.703 64Kbps Co-directional to V35/RS530/449/232/X21	118
----------	--	-----

### E1 to T1 Cross Rate Converter

G703FTEC	Single T1 to E1 Converter	119
----------	---------------------------	-----

### E1/T1 Repeater

ETR01	Single Port E1/T1 Repeater	120
ETR04	Single E1/T1 In to 4 Out Repeater	120

### T1 Family

TRM01	4U 12 Slot Managed T1 (DS1) Concentrator Rack	121
TRM01 Overview	Slide-in Card Options for TRM01	122

### Single T1 Access Unit

TTU01	Single Modular Port T1 (DS1) CSU/DSU	123
-------	--------------------------------------	-----

### Single T1, Multi-Data Port Multiplexer

TTU02-MUX	1U, 2/4 Modular Data Port T1 Multiplexer w/ LCD	124
TTU02-MUX-AD	1U, 2/4 Modular Data Port T1 Multiplexer w/ LCD, Dual Power	124

### Balun

Balun-P	2 Twisted Pairs Balanced RJ-45 Female to 2xBNC male pigtails	125
Balun-B1	1 Twisted Pair Balanced RJ-45 Female to 1xBNC female	125
Balun-B2	2 Twisted Pairs Balanced RJ-45 Female to 2xBNC female	125
BLN3010	1 Twisted Pair IDC to 1x1.6/5.6 Jack	125
BLN4010	1 Twisted Pair IDC to 1xBNC female, Bulkhead mount	125

### Surge Protector

SP-SE-B01	75 Ohm Coaxial Cable Surge Protector	126
-----------	--------------------------------------	-----

# Table of Contents



## IP Networking Series

<b>P. 127</b>	<b>Ethernet over Coax</b>		
	EOC-10	Single Port Ethernet over Coaxial Cable, Non-managed	127
	EOC-20/21	2 Port Ethernet over Coaxial Cable, Managed	128
	<b>G.SHDSL.bis Ethernet First Mile</b>		
	EFM-10	2 Wire (5.7Mbps) EFM LAN Extender	129
	EFM-20	4 Wire (11.4Mbps) EFM LAN Extender	129
	EFM-40	8 Wire (22.8Mbps) EFM LAN Extender	129
	<b>G.SHDSL.bis LAN Extender</b>		
	SHDTU03b-ET100BS	2 Wire (5.7Mbps) TDM Bridge LAN Extender	130
	<b>G.SHDSL LAN Extender</b>		
	SHDTU03-ET100B	2 Wire (2.3Mbps) TDM Bridge LAN Extender	131
	<b>VDSL2 LAN Extender</b>		
	VDTU2A-301	2 Wire VDSL2 LAN Extender	132
	<b>Ethernet Bridge</b>		
	ET100	Ethernet Bridge over Synchronous Data (V35/RS530/449/232/X21)	133
	ET100/G64	Ethernet Bridge over Synchronous G.703 64Kbps Co-directional	134
	ET100/NRZ	Ethernet Bridge over Synchronous NRZ	135
	<b>Ethernet Surge Protector</b>		
	SP-SE-S01-4	Ethernet Surge Protector, 4 wire	136
	SP-SE-S081-8	Ethernet Surge Protector, 8 wire	136

## Tester Series

<b>P. 137</b>	<b>Fiber Tester</b>		
	OTDR-30A	Single Mode Optical Time Domain Reflectometer	137
	HCT-SDH155	STM-1 and G.703 E1 Analyzer / BERT	138
	OPM-300A/B	Optical Power Meter	139
	OLS-100	Optical Laser Source	140
	<b>Protocol Analyzer</b>		
	HCT-7000	Dual Port E1/T1/Datacom Protocol Analyzer and BER Tester	141
	HCT-6000	128Kbps Protocol Analyzer with 2M BERT	143
	<b>PCM Analyzer</b>		
	BTM10	E1/T1 Analyzer and BER Tester	144
	HCT-BERT/H	E1/T1/Datacom BER Tester	147
	HCT-BERT/C	E1/T1/Datacom BER Tester with Color LCD	149
	<b>LAN Cable Tester</b>		
	LCT-300/400	Handy LAN Cable Continuity Tester / Cable Identifier	150

## Interface converters

<b>P. 151</b>	<b>V.35 I/F Converter</b>		
	V35/530IP	V.35 to RS530 Interface Converter	151
	V35/449IP	V.35 to RS449 Interface Converter	151
	V35/X21IP	V.35 to X.21 Interface Converter	151
	<b>RS232 Interface Converter</b>		
	V35IP	RS232 to V35 Interface Converter	152
	449IP	RS232 to RS449 Interface Converter	152
	X21IP	RS232 to X.21 Interface Converter	153
	V35IP-CAB	RS232 to V.35 Cable Interface Converter	153
	<b>RS485 Interface Converters</b>		
	V35/485-1	V.35 to RS485 Interface Converter	154
	ic485IP	Async RS232 to RS422/ RS485, RJ-45 Interface Converter	155
	ic485-3	V.35 to RS485 Interface Converter	156



## Interface converters

### RS232 Short Haul Modem

ic232IP-SM	Async RS232 short haul modem, RJ-45 Interface Converter	157
ic485IP-SM-2	Async RS232 short haul modem, 4-screw terminal Interface Converter	157

### RS232 Current Loop

icCL-2	RS232, Current Loop Converter	158
--------	-------------------------------	-----

### RS232 to CMOS/TTL

ic232TTL	RS232 to TTL/CMOS Interface Converter	159
----------	---------------------------------------	-----

### Async to Sync Converter

icAS/IP	Asynchronous RS232 to Synchronous (HDLC) V.22 Interface Converter	160
---------	---	-----

### DTMF to Pulse Converter

DTMF	Dual Tone Modulation Frequency to Pulse Converter	161
------	---	-----

### Telephone Surge Protector

TSP-10	Telephone, FAX or Dialup Modem Surge Protector	162
--------	--	-----

## Management



P. 163

### Element Management Software Series

EMS	JAVA Based Element Manager for CTC Union Products	163
-----	---	-----

### Graphic User Interface Series

FRM301/401 GUI	Windows Based Management Software for FRM301 & FRM401	165
FMUX01A-GUI	Windows Based Management Software for FMUX01A	165

## IP Surveillance

P. 167

### Digital Video Server

DVS-8301	1-Ch Dual Stream Video Encoder	167
IPS-CH20	2U 20 Slot Managed Chassis	168
DVS-8504E	4-Ch H.264 Digital Video Encoder	169
DVS-8501D	1-Ch H.264 Digital Video Decoder	170

### Embedded License Plate Recognition

LPR-LS	Embedded LPR Slide-in Card (speed 0~40Km/hr)	171
LPR-MS	Embedded LPR Slide-in Card (speed 0~80Km/hr)	171
LPR-HS	Embedded LPR Slide-in Card (speed 0~180Km/hr)	171

### Network Video Recorder

NVR	Enterprise Network Video Recorder (software)	173
-----	--	-----

### Central Management System

SmartView/Plus	Central Management System (software)	176
----------------	--------------------------------------	-----

### Network Camera

IPCAM-8309F	Dual Stream Network Camera	177
IPCAM-8309FW	Dual Stream Network Camera w/ WiFi	178
IPCAM-8309D	Dual Stream Network Dome Camera	179
IPCAM-8308IR	Dual Stream Network IR Camera	180
IPCAM-8318IR	Dual Stream Network IR Camera	181
IPCAM-8318F	Dual Stream Day & Night Network Camera	182
IPCAM-8318P	Dual Stream High-Speed Dome Network Camera	183

### Ethernet over Coax

EOC-10	Ethernet Bridge Modem over Coaxial Cable	184
--------	--	-----

