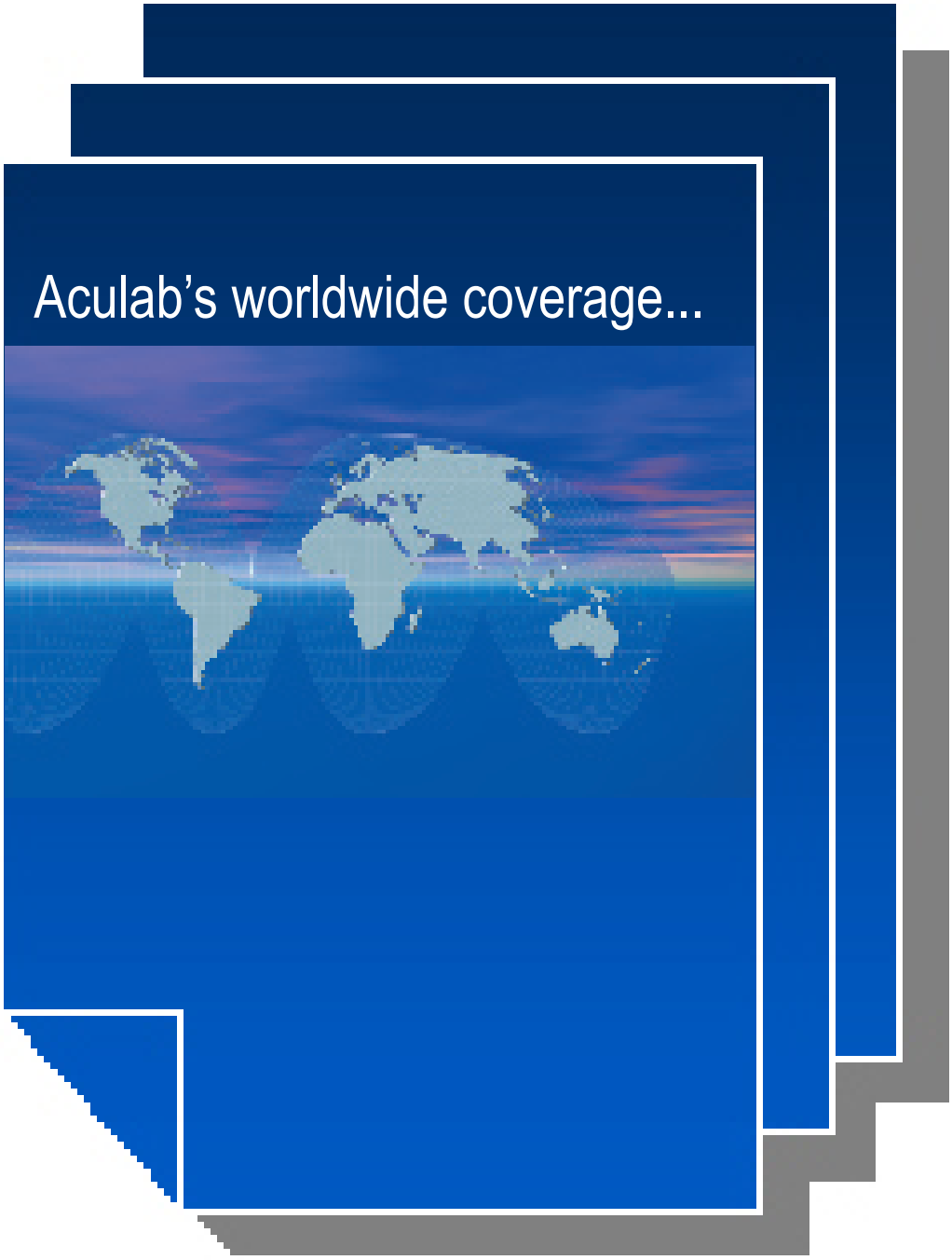
Signalling protocol portfolio



aculab

Aculab UK head office
Tel +44 (0)1908 273 800

Aculab Australia
Tel +61 3 9735 5796

Aculab Germany
Tel +49 (0)89 5080 710

Aculab USA
Tel +1 781 433 6000

www.aculab.com

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Worldwide CAS and ISDN (CCS) protocol coverage

Country	Protocol	Protocol type	Additional notes	Aculab protocol stack
Argentina	R2 CAS	CAS		R2T1
Australia	TS014	CCS	No longer supplied	AUSTEL-TS014
Australia	•TS038	CCS		ETS300
Australia	P2	CAS	TS003/TPH1271/R2D	R2T1
Belgium	National R2	CAS		R2T1
Belgium	National R2	DTMF CAS		BELGU
Brazil	•Euro ISDN	CCS		ETS300
Brazil	MFC R2	CAS	Brazil 5C	R2T1
Canada	T1 Robbed bit	CAS		T1RB
Chile	MFC R2	CAS		R2T1
China	R2	CAS	China#1	R2T1
China	•Chinese ISDN	CCS		ETS300
Colombia	R2	CAS		R2T1
Croatia	R2	CAS		R2T1
Czech Republic	R2	CAS		R2T1
Czech Republic	MFC R2	CAS	Type K	R2T1
Denmark	National MFC R2	CAS		R2DK
Egypt	MFC R2	CAS		R2T1
EU-wide	•Euro ISDN	CCS		ETS300
Finland	R2	CAS		R2T1
France	MF R1 Socotel	CAS		FMFS
France	VN3	CCS	No longer supplied	VN3
France	•VN6	CCS		ETS300
Germany	•1TR6	CCS	No longer supplied	1TR6
Greece	OTE 4	CAS	4-bit CAS	OTE4
Greece	OTE 2	CAS	2-bit CAS	OTE2
Hong Kong	•CR13 IDA-P	CCS	No longer supplied	ETS300
Hong Kong	•HKTA 2015	CCS		ETS300
Hong Kong	HKT 2018 Robbed	CAS	T1HK; AMI or B8ZS	T1HK
India	MFC E&M	CAS		R2T1
India	MFC R2	CAS	Type 1/2/3	R2T1
Indonesia	R2 (Q.421)	CAS	Ericsson loop signalling	R2T1
Indonesia	SMFC R2	CAS	Semi-compelled	IEM
Iran	R2	CAS	3-bit decadic	R2T1
Israel	•ETS 300	CCS		ETS300
Israel	MFC R2	CAS	Israel R2	R2T1
Italy	I701	CAS		I701
Japan	•INS 1500	CCS		INS1500
Jordan	R2	CAS		R2T1
Korea	•Euro ISDN	CCS		ETS300
Korea	R2	CAS		R2T1
Kuwait	R2	CAS		R2T1
Latvia	MFC R2	CAS		R2T1
Malaysia	MFC R2	CAS		R2T1
Malaysia	MFC R2	CAS		IEM
Malta	MFC R2	CAS		R2T1
Mexico	R2	CAS		R2T1
Netherlands	ALS70D	CAS	T11-53E	ALSN/ALSU
Netherlands	MFC R2	CAS		R2T1
New Zealand	•TNA134	CCS	Q.931	ETS300
Norway	National MFC R2	CAS		R2T1
Peru	MFC R2	CAS		R2T1
Philippines	R2	CAS		R2T1
Poland	•EuroISDN	CCS		ETS300
Poland	MFC R2	CAS		R2T1
Portugal	MFC R2	CAS		R2T1
Sierra Leone	MFC R2	CAS		R2T1
Singapore	•IDA TS ISDN2	CCS		ETS 300
Singapore	•Fetex	CCS	Not supplied for Prosody X	FETEX
Singapore	MFC R2	CAS		R2T1[2]
Singapore	MFC R2	CAS		IEM
South Africa	•Euro ISDN	CCS		ETS300
South Africa	MFC R2	CAS		R2T1
Spain	MF R1 Socotel	CAS		SMFS
Sweden	CAS extension EL7	CAS	Ericsson ASB/voicemail	EL7
Sweden	P8	CAS	P8 DDI and P7 non-DDI	P8
Taiwan	MF R1	CAS	Modified	T1RB
Thailand	National R2 DTMF	CAS		R2T1
Turkey	R1	CAS		E1LS
UK	•DASS2	CCS		DASS
UK	•DPNSS	CCS		DPNSS
UK	BT/MCL	CAS[1]	Asymmetrical	BTMC
UK	BT Callstream	CAS[1]	SIN 205/356	BTCU/BTCN
UK	PD1	CAS[1]	MCL PD1/DC5A	PD1
USA	•AT&T	CCS	TR41459	ATT-T1
USA	•DMS 100	CCS	Nortel DMS (T1)	DMS100
USA	•National ISDN 2	CCS	NI1 and NI2	NI2
USA	•National ISDN 2	CCS	NFAS (with D-channel	NI2
USA	T1 robbed bit	CAS[1]		T1RB
Worldwide (ex USA)	E1 line side CAS	CAS[1]	AT&T Definity and Nortel	E1LS
Worldwide	MFC R2	CAS[1]	Q.421/Q.441	R2T1[2]
Worldwide	SS5	CAS[1]	CCITT SS5 (C5)	SS5
Worldwide	Decadic CAS	CAS	Generic use with PBXs	R2T1[2]
Worldwide	E&M type A	CAS[1]	Ericsson DC5 and E&M	EEMA
Worldwide	30DLI	CAS[1]	NEC PA-30DTS	30DLI
Worldwide	•O.SIG	CCS		QSIG

Notes:

1. A DSP 65 module is required for INS 1500, DTMF or CAS tone signalling with E1/T1 PCI boards. A PMXC is needed for SS7 and DTMF or CAS tone signalling with Prosody X PCI and cPCI variants. A CAS/SS7 DSP is needed for SS7 and DTMF or CAS tone signalling with PCIe variants.

2. Protocols marked '■' in the table are compatible with Aculab's Passive Monitor products based upon E1/T1 PCI boards. In the case of Canada and the USA, the applicable protocols are T1 Q.931/Q.932-based ISDN protocols only. Aculab's 'p-monitor' firmware is required.

3. Aculab's R2T1 firmware provides a generic MFC R2 protocol stack, which uses firmware switches to establish specific national or signalling variants. See the individual protocol release notes available via the Aculab installation tool (AIT).

4. Many CAS protocols provide for selection of either decadic (dial pulse), DTMF or MFR1 or MFC R2 register signalling and a number of line signalling methods. See the individual protocol release notes.

5. The majority of protocols are balanced, meaning that the same protocol may be used at both user and network ends of a link. In some cases user and network ends are established by switches in the firmware. Some protocols are provided by means of separate firmware for user and network ends. See the individual protocol release notes.

6. Some protocols offer both DDI and non-DDI options. See the individual protocol release notes.

7. In some cases the source specification documentation is less than thorough in its treatment of the protocol, leaving operations open to interpretation. Aculab is grateful for any feedback regarding the use of any listed protocol.

8. If you cannot find the protocol you need listed here, we may be able to help, as often, particularly with CAS protocols, an existing variant can prove viable. Aculab's generic MFC R2 stack often proves suitable for use even in countries where it has not already been validated for use against a specification. Aculab are able to compare an existing protocol stack against your specification, or alternatively may be able to produce the required variant for you. Please contact your Account Manager or email sales@aculab.com to discuss your requirements.

9. Developers looking to use 'host independent' approved Aculab products in their complete CT systems should not require further telecoms approval for that system prior to network connection.

IP protocols and signalling stacks

Protocol	IETF specification	Feature description
SIP (session initiation protocol)	RFC 3261	Session initiation protocol
		SIP on UDP and TCP
		SIPS (SIP over TLS)
	RFC 3262	Reliable provisional responses (PRACK)
	RFC 4566	Session description protocol (SDP)
	RFC 3665	Basic call flow examples
	RFC 3666	SIP/PSTN call flows
	RFC 3264	Offer/answer model with SDP
	RFC 2617	HTTP authentication: basic and digest access authentication (client-side)
	RFC 3725	Third party call control best practices
	RFC 3515	The REFER method (transfer scenario)
	RFC 3204	MIME media types for Q.SIG/ISUP
	RFC 2976	INFO method
	RFC 3891	Replaces header
	RFC 5359	Hold, transfer and blind transfer best current practices
	RFC 3892	Referred by header
	RFC 3261	TCP support
	RFC 3581	Symmetric signalling ports
	RFC 4028	SIP session timers
	RFC 3311	UPDATE method
	RFC 3265[1]	Subscribe/specific event notification
	RFC 3489[1]	STUN API
RFCs and drafts related to SIP eco-system	RFC 3711	Secure RTP support
	RFC 2833	RTP payload for DTMF digits, tones and signals
	RFC 3550	Real-time control protocol (RTCP)
	Draft-ietf-avt-rtcp-report-extns-01	RTCP reporting extensions (RTCP XP); receive only
	Custom headers (via Aculab's extended SIP API)	Users can implement a number of RFCs, using the API to insert and extract custom headers e.g., RFC 4244 history/diversion information
MRCP (media resource control protocol)		MRCP v1 draft 7
		MRCP v2 draft 11
Protocol	**ITU-T specification**	**Feature description**
H.323	H.323 version 2	Packet-based multimedia communications systems
	H.225 version 2	Including support for fast-start; non-standard data field (NSDF); RAS gatekeeper failover; H.323-ID addressing; NSM RAS and connectionless facility messages
	H.245 version 3	Including support for H.245 tunnelling; third party hold; early H.245; and DTMF relay
	H.450.1; H.450.2; H.450.3; H.450.4; H.450.6	Supplementary services (call transfer; call diversion; call waiting; and call hold)
3G-324M[1]		Including support for H.223

Note: 1. Roadmap feature; contact your Account Manager for details

Aculab SS7 protocol stack coverage

Protocol conformance	
TCAP (transaction capabilities application part) [2 4]	Q.771-Q.774 (1997/white book); ANSI TCAP T1.114 (1996); China TCAP GF011-95
SCCP (signalling connection control part) [2 4]	Q.711-Q.714 (1996/white book); ANSI SCCP T1.112 (1996); China SCCP GF010-95
ISUP (ISDN user part) [2]	ITU-T ISUP (1999/white book); ANSI ISUP T1.113 (1995); Q.767 International ISUP; China ISUP YDN-038 (1997); ETSI ISUP V4 (2001); UK ISUP (2001); user definable variants [1]
MTP 3 (message transfer part layer 3) [2]	Q.704 (1996/white book); ANSI T1.111 (1996); China GF001-9001 (1990)
MTP 2 (message transfer part layer 2) [2]	Q.703 (1996/white book); ANSI T1.111 (1996); China GF001-9001 (1990)
M3UA (message transfer part 3 user adaptation layer) [3]	IETF RFC 4666; ETSI TS 102 142 V1.1.1 (2003-05)
SCTP (stream control transmission protocol)	IETF RFC 2960; RFC 3257; RFC 4166

Notes:

1. Aculab's SS7 software enables user-configurable ISUP message formats through which other national and international variants can be defined to meet specific needs
2. These signalling protocols are offered under a cost free license when used with Aculab's cards in cPCI, PCI or PCIe form factor
3. M3UA signalling software is offered for a fee under the terms of a software license for use on a per host basis
4. The software supports the practical combination of mixed stack layers, such as, for example, ANSI TCAP with ITU SCCP (and vice versa)

Host independent approvals

Country	Approved product		Approval authority	Approval number	Additional notes
Australia	All Prosody X boards with PMX/PMXC		ACMA	Self declaration ('A-TICK')	E1
Australia	E1/T1 PCI with PM	•	ACMA	Self declaration ('A-TICK')	E1
Brazil	E1/T1 PCI with PM	•	Anatel	0030-06-1140	E1
Canada	Prosody X PCI with PMX/PMXC1		Industry Canada	2789A-AC5200	T1
Canada	All Prosody X and E1/T1 PCIe boards		Industry Canada	2789A-PCIEX	T1 - fitted with DSP for CAS/SS7 if applicable
Canada	E1/T1 PCI boards with PM	•	Industry Canada	2789A 12217	T1 - fitted with DSP if applicable
China	Prosody X PCI with PMX/PMXC		CQC	12-7170-060345	E1
China	E1/T1 PCI with PM	•	CCC	15-5288-020439	E1
EU-wide	Prosody X PCI with PMX/PMXC		Self declaration	Self declaration under RTTE	E1
EU-wide	E1/T1 PCI with PM	•	Self declaration	Self declaration under RTTE	E1
Hong Kong	Prosody X PCI with 1 DSP and PMX/PMXC		OFTA	IN606049	T1 - HKTA2015
Hong Kong	Prosody X PCI with 2 DSPs and PMX/PMXC		OFTA	IN606048	T1 - HKTA2015
Hong Kong	Prosody X PCI with 4 DSPs and PMX/PMXC		OFTA	IN406047	T1 - HKTA2015
Hong Kong	E1/T1 PCI with PM	•	OFTA	IN403011	T1 - HKTA2015
India	Prosody X PCI		TEC	TEC/NR/I/CTI-01/03/068.DEC07	E1
India	Prosody X PCIe		TEC	TEC/NR/I/CTI-01/03/069.DEC07	E1
India	E1/T1 PCI with PM	•	TEC	TEC/WR/I/CTI-01/02/052.SEP 04	E1
Japan	Prosody X PCIe with DSP module		Japan	T C 08-0002 205	T1 - INS 1500
Japan	Prosody X PCI with PMXC 1		Japan	07225004/AA/00	T1 - INS 1500
Japan	Prosody X PCI with PMXC 2		Japan	07225005/AA/00	T1 - INS 1500
Japan	Prosody X PCI with PMXC 4		Japan	07225006/AA/00	T1 - INS 1500
Japan	Prosody X PCI with PMXC 8		Japan	07225002/AA/00	T1 - INS 1500
Japan	E1/T1 PCI with PM and DSP 65	•	Japan	04225006/AA/OO	T1 - INS 1500
Korea	E1/T1 PCI with PM	•	KCC	TE-C99/K900-03-00093	E1
Korea	Prosody X PCI - 4 DSPs; PMX/PMXC		KCC	AC1-AC5203 (A)	E1
Malaysia	Prosody X PCI with PMX/PMXC		SIRIM QAS	CETS/394B/0506/T	E1
Malaysia	E1/T1 PCI with PM	•	SIRIM QAS	ISDA/48A/0603/S	E1
Mexico	E1/T1 PCI with PM	•	Cofetel	RCPACAC04-712	E1
New Zealand	Prosody X PCI with PMX/PMXC		Telecom NZ	PTC232/06/001	E1
New Zealand	E1/T1 PCI with PM	•	Telecom NZ	PTC220/02/029	E1
Singapore	Prosody X PCI with PMX/PMXC		IDA	G0373-06	E1
Singapore	E1/T1 PCI with PM	•	IDA	ISDN2-0631-2003	E1
South Africa	Prosody X PCIe with 1 DSP and 2 E1/T1 trunks		ICASA	TE-2008/110	E1
South Africa	Prosody X PCIe with 2 DSPs and 4 E1/T1 trunks		ICASA	TE-2008/109	E1
South Africa	Prosody X E1/T1 PCIe with 4 E1/T1 trunks		ICASA	TE-2008/111	E1
South Africa	Prosody X PCI with PMX/PMXC		ICASA	SS-743.01	E1
Ukraine	Prosody X PCI with 1 DSP and PMX/PMXC		Ukraine	UA1 025.0132915-08	E1
Ukraine	Prosody X PCI with 2 DSP and PMX/PMXC		Ukraine	UA1 025.0132914-08	E1
Ukraine	Prosody X PCI with 4 DSP and PMX/PMXC		Ukraine	UA1 025.0132911-08	E1
USA	Prosody X PCI with PMX/PMXC		ACTA	5TCXDNANPMXPCIX	T1 - fitted with DSP if applicable
USA	E1/T1 PCI with PM	•	ACTA	5TCXDNANPM4MODT1	T1 - fitted with DSP if applicable

Notes:

1. Protocols marked • in the table are compatible with Aculab's Passive monitor products based upon E1/T1 PCI boards. In the case of Canada and the USA, the applicable protocols are T1 Q.931/Q.932-based ISDN protocols only. Aculab's 'p-monitor' firmware is required.

2. Primary rate modules PM4/2/1 are used on E1/T1 PCI boards, and Passive monitor variants. PMX/PMXC modules are used on Prosody X variants. A DSP 65 module is required for INS 1500, DTMF or CAS tone signalling with E1/T1 PCI boards. A PMXC is needed for SS7 and DTMF or CAS tone signalling with Prosody X PCI and cPCI variants. A CAS/SS7 DSP is needed for SS7 and DTMF or CAS tone signalling with PCIe variants. View the product pages, contact your Account Manager or email sales@aculab.com for details of configuration options available.

3. EU-wide member states are: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, the Netherlands, United Kingdom (UK). Although not member states, Iceland, Norway and Switzerland have accepted EU telecommunications approvals.

4. All products are fully RoHS compliant and are Safety and EMC approved to meet all international certification schemes (e.g., CB, UL, CUL) and mandatory international standards.

5. Products approved for China also carry China Compulsory Certification issued by the CQC approvals body for Prosody X PCI via approval number 2008011607314008.

For more information, please contact your Aculab Account Manager or visit www.aculab.com

Owing to the dynamic nature of our business, specifications are constantly being changed and therefore this signalling protocol portfolio is for informational purposes only.