Worldwide CAS and ISDN (CCS) protocol coverage

Country	Protocol	Protocol type	Additional notes	Aculab protocol
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	Available on request	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	Available on request	FMFS
France	VN3	CCS	No longer supplied	VN3
France	VN6	CCS		ETS300
Germany	1TR6	CCS	No longer supplied	1TR6
Greece	OTE 4	CAS	Available on request	OTE4
Greece	OTE 2	CAS	Available on request	OTE2
Hong Kong	CR13 IDA-P	CCS	No longer supplied	ETS300
Hong Kong	HKTA 2015	CCS		ETS300
Hong Kong	HKT 2018 Robbed bit	CAS	T1HK; AMI or B8ZS encoding	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	Available on request	I701
Japan	INS 1500	CCS	Hardware specific	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	Available on request	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	Available on request	SMFS
Sweden	CAS extension EL7	CAS	Available on request	EL7
Sweden	P8	CAS	Available on request	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 Interconnect	CAS[1]	Available on request	BTMC
UK	BT Callstream	CAS[1]	Available on request	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 back-up)	NI2
USA	T1 robbed bit	CAS[1]		T1RB
Worldwide (ex USA)	E1 line side CAS	CAS[1]	AT&T Definity and Nortel Meridian	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 options	EEMA
Worldwide	30DLI	CAS[1]	Available on request	30DLI
Worldwide	Q.SIG	CCS		QSIG

Notes:

1. 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).

3. 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.

4. 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.

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

6. 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.

7. 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.

8. 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 (SCTP[1])
		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	Subscribe/specific event notification
	RFC 3428	Extension for Instant Messaging
RFCs and drafts related to SIP eco-system	RFC 3711[2]	Secure RTP support
	RFC 2833/RFC 4733[3]	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

Notes:

1. Roadmap feature
2. Release controlled (contact your Account Manager for details)
3. RFC4733 support - DTMF handling - the optional event codes defined in RFC4733 are not yet supported

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 Prosody X boards or 1U chassis
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 specific approvals for Aculab media processing boards housed within a host platform.

Country	Approved product	Approval authority	Approval number	Additional notes
Australia	Revision 3 PCIe boards	ACMA	Self declaration ('A-TICK')	E1
EU-wide	Prosody X revision 3 PCIe	Self declaration	Self declaration under RTTE	E1
USA	Prosody X revision 3 PCIe	ACTA	5TCXDNANREV3PROSODYX	T1

Notes:

1. The Prosody X revision 3 PCIe board is also used in the Prosody X 1U HA chassis and the GroomerII gateway.

2. 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.

3. 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.

For more information, please contact your Account Manager or view our website