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OF ITU

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Amendment 1
(07/2001)

SERIES V: DATA COMMUNICATION OVER THE
TELEPHONE NETWORK

Control procedures

Serial asynchronous automatic dialling and control
Amendment 1

ITU-T Recommendation V.250 – Amendment 1

(Formerly CCITT Recommendation)

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ITU-T Recommendation V.250

Serial asynchronous automatic dialling and control

AMENDMENT 1

Summary

This document provides an amendment to the 1999 edition of ITU-T V.250. It is intended to be read in conjunction with the Recommendation. The changes, defined herein supersede the 2000 version of the V.250 Implementors' Guide.

Source

Amendment 1 to ITU-T Recommendation V.250 was prepared by ITU-T Study Group 16 (2001-2004) and approved under the WTSA Resolution 1 procedure on 29 July 2001.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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ITU-T Recommendation V.250

Serial asynchronous automatic dialling and control

AMENDMENT 1

0) Introduction

This document provides an amendment to the 1999 edition of ITU-T V.250. It is intended to be read in conjunction with the Recommendation. The changes, defined herein, supersede the 2000 version of the V.250 Implementor's Guide.

1) Clause 2.2 – Additional informative references

Add the following to clause 2.2: Informative references:

- ITU-T V.44 (2000), *Data compression procedures*.
- ITU-T V.59 (2000), *Managed objects for diagnostic information of public switched telephone network connected V-series modem DCEs*.
- ITU-T V.90 (1998), *A digital modem and analogue modem pair for use on the public Switched Telephone Network (PSTN) at data signalling rates of up to 56 000 bit/s downstream and up to 33 600 bit/s upstream*.
- ITU-T V.91 (1999), *A digital modem operating at data signalling rates of up to 64 000 bit/s for use on a 4-wire circuit switched connection and on leased point-to-point 4-wire digital circuits*.
- ITU-T V.92 (2000), *Enhancements to Recommendation V.90*.

2) Table 13/V.250: Standard modulation <carrier> strings

The table did not contain ITU-T V.90, ITU-T V.91 or ITU-T V.92 as selections. *Therefore, replace Table 13 with the following corrected table:*

Table 13/V.250 – Standard modulation <carrier> strings

<carrier>	Description
	ITU-T Standard Modulations
V21	ITU-T V.21
V22	ITU-T V.22
V22B	ITU-T V.22 <i>bis</i>
V23S	ITU-T V.23, with Switched carrier, TDM
V23C	ITU-T V.23, with Constant carrier, asymmetric FDM
V26B	ITU-T V.26 <i>bis</i>
V27TC	ITU-T V.27 <i>ter</i> , with Constant carrier, FDM
V32	ITU-T V.32
V32B	ITU-T V.32 <i>bis</i>
V34	ITU-T V.34
V90	ITU-T V.90

Table 13/V.250 – Standard modulation <carrier> strings

<carrier>	Description
V91	ITU-T V.91
V92	ITU-T V.92
NOTE – Manufacture proprietary strings may be defined; they shall not begin with the "V" character.	

For <automode>:

0	Disabled
1	Enabled, with ITU-T V.8 or Annex A/V.32 <i>bis</i> where applicable

3) Table 15/V.250: V.18 operation modes and Table 16/V.250: V.18 connection report intermediate result codes

The tables did not allow for mode selection in advance and direct selection of reverse mode of duplex carrier-based modems when calling or answering. *Therefore, replace Tables 15 and 16 with the following corrected tables:*

Table 15/V.250 – V.18 operation modes

<mode> <dflt_ans_mode>	Description
0	Disables V.18 operation
1	V.18 operation, auto detect mode (Note 1)
2	V.18 operation, connect in 5-bit (Baudot) mode at 45.5 bit/s
12	V.18 operation, connect in 5-bit (Baudot) mode at 50 bit/s
3	V.18 operation, connect in DTMF mode
4	V.18 operation, connect in EDT mode
5	V.18 operation, connect in V.21 mode (Note 2)
6	V.18 operation, connect in V.23 mode (Note 2)
7	V.18 operation, connect in Bell 103-type mode (Note 2)
15	V.18 operation, connect in V.21 answer mode (Note 3)
16	V.18 operation, connect in V.23 master mode (Note 3)
17	V.18 operation, connect in Bell 103 answer mode (Note 3)
<fbk_time_enable>	
0	Disable
1	Enable
<and_msg_enable>	
0	Disable
1	Enable
<probing_en>	
0	Disable the probing
1	Enable the probing
2	Initiate probing (expire Ta Timer)
NOTE 1 – There is no option to select calling or answer mode for V.18.	
NOTE 2 – Calling mode implies transmit on channel 1 and receive on channel 2.	
NOTE 3 – Answer mode implies transmit on channel 2 and receive on channel 1.	

Table 16/V.250 – V.18 connection report intermediate result codes

+MV18: 5BIT50	Indicates connection with 5 bit
+MV18: 5BIT45	Indicates connection with 5 bit
+MV18: EDT	Indicates connection with EDT
+MV18: DTMF	Indicates connection with DTMF
+MV18: V21C (Note)	Indicates connection with ITU-T V.21
+MV18: V21A (Note)	Indicates connection with ITU-T V.21
+MV18: V23M	Indicates connection with ITU-T V.23 in Master Mode (sending on 1200 bit/s, receiving on 75 bit/s)
+MV18: V23S	Indicates connection with ITU-T V.23 in Slave Mode, (sending on 75 bit/s, receiving on 1 200 bit/s)
+MV18: B103C (Note)	Indicates connection with Bell 103-type modulation
+MV18: B103A (Note)	Indicates connection with Bell 103-type modulation
+MV18: V18	Indicates both DCEs are in ITU-T V.18
NOTE – "C" indicates modem is in call mode, i.e. transmitting on channel 1 and receiving on channel 2. "A" indicates modem is in answer mode.	

4) **Clause 6.6: Data compression commands**

This clause provided commands in support of V.42 *bis*. With the approval of ITU-T V.44, commands are needed to support this Recommendation. *Therefore, replace clause 6.6 with the following corrected text and tables:*

6.6 **Data compression commands**

This clause contains parameters to condition the DCE to use standard Data Compression Procedures.

6.6.1 **V.42 *bis* data compression (+DS)**

Parameter

+DS=[<direction>[,<compression_negotiation>[,<max_dict>[,<max_string>]]]]

Description

This extended-format compound parameter controls the V.42 *bis* data compression function if provided in the DCE. It accepts four numeric subparameters:

- **<direction>**, which specifies the desired direction(s) of operation of the data compression function; from the DTE point of view;
- **<compression_negotiation>**, which specifies whether or not the DCE should continue to operate if the desired result is not obtained;
- **<max_dict>**, which specifies the maximum number of dictionary entries which should be negotiated (may be used by the DTE to limit the codeword size transmitted, based on its knowledge of the nature of the data to be transmitted);
- **<max_string>**, which specifies the maximum string length to be negotiated (V.42 *bis* P2).

Defined values

See Table 27.

Table 27/V.250 – Data compression control subparameters

<direction>:	Description
0	Negotiated ... no compression (V.42 <i>bis</i> P0 = 0)
1	Transmit only
2	Receive only
3	Both directions, accept any direction (V.42 <i>bis</i> P0 = 11)
<compression_negotiation>	
0	Do not disconnect if ITU-T V.42 <i>bis</i> is not negotiated by the remote DCE as specified in <direction>
1	Disconnect if ITU-T V.42 <i>bis</i> is not negotiated by the remote DCE as specified in <direction>
<max_dict>:	512 to 65535
<max_string>:	6 to 250

Recommended default settings

For <direction>: **3**

For <compression_negotiation>: **0**

For <max_dict>: Determined by the manufacturer (see Appendix II/V.42 *bis*)

For <max_string>: **6**

Read syntax

+DS?

The DCE shall transmit a string of information text to the DTE, consisting of:

+DS=<direction>,<compression_negotiation>,<max_dict>,<max_string>

e.g. +DS:3,0,8192,6 for the recommended defaults and 8K max dictionary.

Test syntax

+DS=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+DS: (list of supported <direction> values),(list of supported <compression_negotiation> values),(list of supported <max_dict> values),(list of supported <max_string> values)

e.g. +DS: (0-3),(0-2),(512-8192),(6-250).

Implementation

Implementation of this parameter is mandatory if V.42 *bis* data compression is implemented in the DCE.

6.6.2 V.44 Data Compression (+DS44)

Parameter

+DS44=[<direction>[,<compression_negotiation>[,<capability>[,<max_codewords_tx>[,<max_codewords_rx>[,<max_string_tx>[,<max_string_rx>[,<max_history_tx>[,<max_history_rx>]]]]]]]]

Description

This extended-format compound parameter controls the V.44 data compression function if provided in the DCE. It accepts four numeric subparameters:

- **<direction>**, which specifies the desired direction(s) of operation of the data compression function; from the DTE point of view;
- **<compression_negotiation>**, which specifies whether or not the DCE should continue to operate if the desired result is not obtained;
- **<capability>**, which specifies the use of stream method, packet method, multi-packet method;
- **<max_codewords_tx>**, which specifies the maximum number of codewords which should be negotiated in the transmit direction;
- **<max_codewords_rx>**, which specifies the maximum number of codewords which should be negotiated in the receive direction;
- **<max_string_tx>**, which specifies the maximum string length to be negotiated in the transmit direction;
- **<max_string_rx>**, which specifies the maximum string length to be negotiated in the receive direction;
- **<max_history_tx>**, which specifies the maximum size of the history buffer to be negotiated in the transmit direction;
- **<max_history_rx>**, which specifies the maximum size of the history buffer to be negotiated in the receive direction.

Defined values

See Table 28.

Table 28/V.250 – Data compression control subparameters

<direction>:	Description
0	Negotiated ... no compression
1	Transmit only
2	Receive only
3	Both directions, accept any direction
<compression_negotiation>	
0	Do not disconnect if ITU-T V.44 is not negotiated by the remote DCE as specified in <direction>
1	Disconnect if ITU-T V.44 is not negotiated by the remote DCE as specified in <direction>
<capability>	
0	Stream method
1	Packet method
2	Multi-packet method
<max_codewords_tx>	256 to 65536

<max_codewords_rx>	256 to 65536
<max_string_tx>:	32 to 255
<max_string_rx>:	32 to 255
<max_history_tx>	≥512
<max_history_rx>	≥512

Recommended default settings

For <direction>:	3
For <compression_negotiation>:	0
For <capability>:	0
For <max_codewords_tx>:	Determined by the manufacturer (see Appendix I/V.44)
For <max_codewords_rx>:	Determined by the manufacturer (see Appendix I/V.44)
For <max_string_tx>:	Determined by the manufacturer (see Appendix I/V.44)
For <max_string_rx>:	Determined by the manufacturer (see Appendix I/V.44)
For <max_history_tx>:	Determined by the manufacturer (see Appendix I/V.44)
For <max_history_rx>:	Determined by the manufacturer (see Appendix I/V.44)

Read syntax

+DS44?

The DCE shall transmit a string of information text to the DTE, consisting of:

+DS44:<direction><compression_negotiation>,<capability>,<max_codewords_tx>,<max_codewords_rx>,<max_string_tx>,<max_string_rx>,<max_history_tx>,<max_history_rx>

e.g. +DS44:3,0,0,1024,1024,255,255,3072,3072.

Test syntax

+DS44=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+DS: (list of supported <direction> values),(list of supported <compression_negotiation> values),(list of supported <capability> values),(list of supported <max_codewords_tx> values),(list of supported <max_codewords_rx> values),(list of supported <max_string_tx> values),(list of supported <max_string_rx> values),(list of supported <max_history_tx> values),(list of supported <max_history_rx> values)

Implementation

Implementation of this parameter is mandatory if V.44 data compression is implemented in the DCE.

6.6.3 Data compression reporting (+DR)

Parameter

+DR=<value>

Description

This extended-format numeric parameter controls whether or not the extended-format "+DR." intermediate result code is transmitted from the DCE to the DTE. The +DR:<type> reported shall represent the current (negotiated or renegotiated) DCE-DCE data compression type. If enabled, the

intermediate result code is transmitted at the point after error control negotiation (handshaking) at which the DCE has determined which data compression technique will be used (if any) and the direction of operation. The format of this result code is the following (see Table 29):

Table 29/V.250 – Data compression reporting intermediate result codes

+DR: NONE	Data compression is not in use
+DR: V42B	ITU-T V.42 <i>bis</i> is in use in both directions
+DR: V42B RD	ITU-T V.42 <i>bis</i> is in use in receive direction only
+DR: V42B TD	ITU-T V.42 <i>bis</i> is in use in transmit direction only
+DR: V44	ITU-T V.44 is in use in both directions
+DR: V44 RD	ITU-T V.44 is in use in receive direction only
+DR: V44 TD	ITU-T V.44 is in use in transmit direction only

The +DR intermediate result code, if enabled, is issued after the Error Control Report (+ER) and before the final result code (e.g. CONNECT).

Defined values

See Table 30.

Table 30/V.250 – Data compression reporting values

<value>	Description
0	Data compression reporting disabled (no +DR result code transmitted)
1	Data compression reporting enabled (+DR result code transmitted)

Recommended default setting

0

Read syntax

+DR?

The DCE shall transmit a line of information text to the DTE, consisting of:

+DR: <current setting>

For example, with the recommended default setting, the DCE could report:

+DR: 0

Test syntax

+DR=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+DR: (list of supported values)

For example, a DCE that supported all defined settings would report:

+DR: (0,1)

Implementation

Implementation of this parameter and the associated intermediate result code is mandatory if data compression is implemented in the DCE.

5) New clause 6.8 – Additional commands to support ITU-T V.92

This clause provides commands to support ITU-T V.92. A new +P series of commands has been created to support PCM DCEs. *Add the following new text and tables as clause 6.8: PCM DCE commands:*

6.8 PCM DCE commands

This clause contains a set of +P (PCM DCE) commands and parameters to condition and control DCE use of ITU-T V.92.

6.8.1 Call Waiting enable (+PCW)

Parameter

+PCW=[<call waiting>

Description

This extended-format compound numeric parameter controls the action to be taken upon detection of call waiting in a V.92 DCE.

Defined values

See Table 31.

Table 31/V.250 – Call Waiting Values

<call waiting>	Description
0	Toggle V.24 Circuit 125 and collect Caller ID if enabled by +VCID
1	Hang up
2	Ignore V.92 call waiting

Default setting

0

Read syntax

+PCW?

The DCE shall transmit a line of information text to the DTE, consisting of:

+PCW: <call waiting>

For example, with the default setting, the DCE could report:

+PCW: 0

Test syntax

+PCW=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+PCW: (list of supported values of <call waiting>)

For example, a DCE that supported all defined settings would report:

+PCW: (0,1,2)

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6.8.2 Modem on Hold enable (+PMH)

Parameter

+PMH=[<value>]

Description

This extended-format compound numeric parameter controls whether or not modem on hold procedures are enabled during V.92 operation.

Defined values

See Table 32.

Table 32/V.250 – Modem on Hold enable

<value>	Description
0	Enables V.92 modem on hold
1	Disables V.92 modem on hold

Default setting

0

Read syntax

+PMH?

The DCE shall transmit a line of information text to the DTE, consisting of:

+PMH: <current setting>

For example, with the default setting, the DCE could report:

+PMH: 0

Test syntax

+PMH=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+PMH: (list of supported values)

For example, a DCE that supported all defined settings would report:

+PMH: (0,1)

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6.8.3 Modem on Hold Timer (+PMHT)

This extended-format compound numeric parameter controls whether or not the modem will grant or deny a Modem on-hold (MOH) request as well as setting the Modem-on-Hold-Timeout.

Defined values

See Table 33.

Table 33/V.250 – Modem on Hold Timer values

<value>	Description
0	Deny V.92 Modem-on-hold Request
1	Grant MOH with 10-second timeout
2	Grant MOH with 20-second timeout
3	Grant MOH with 30-second timeout
4	Grant MOH with 40-second timeout
5	Grant MOH with 1-minute timeout
6	Grant MOH with 2-minute timeout
7	Grant MOH with 3-minute timeout
8	Grant MOH with 4-minute timeout
9	Grant MOH with 6-minute timeout
10	Grant MOH with 8-minute timeout
11	Grant MOH with 12-minute timeout
12	Grant MOH with 16-minute timeout
13	Grant MOH with indefinite timeout

Read syntax

+PMHT?

The DCE shall transmit a line of information text to the DTE, consisting of:

+PMHT: <current setting>

For example, with <value> set to Deny V.92 Modem-on-hold Request, the DCE would report:

+PMHT: 0

Test syntax

+PMHT=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+PMHT: (list of supported values)

For example, a DCE that supported all defined settings would report:

+PMHT: (0,1,2,3,4,5,6,7,8,9,10,11,12,13)

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6.8.4 Initiate Modem on Hold (+PMHR)

Parameter

+PMHR

Description

This extended-format command requests the DCE to initiate or to confirm a modem on hold procedure. The DCE shall return **ERROR** if Modem on Hold is not enabled or if the DCE is in an idle condition. The DCE shall return the string response +PMHR: <value> where <value> is a decimal value corresponding to the Modem on Hold timer value received or the request status during the DCE's modem on hold exchange procedure as defined in Table 34. This response may be delayed depending upon the context under which the +PMHR command is made, i.e. if the +PMHR is in response to an incoming Modem on Hold or if it is initiating a request.

Defined values

None.

Read Syntax

+PMHR

Table 34/V.250 – Modem on Hold Response values

<value>	Description
0	V.92 Modem on Hold Request Denied or not available. The modem may initiate another Modem-on-hold request later.
1	MOH with 10-second timeout Granted
2	MOH with 20-second timeout Granted
3	MOH with 30-second timeout Granted
4	MOH with 40-second timeout Granted
5	MOH with 1-minute timeout Granted
6	MOH with 2-minute timeout Granted
7	MOH with 3-minute timeout Granted
8	MOH with 4-minute timeout Granted
9	MOH with 6-minute timeout Granted
10	MOH with 8-minute timeout Granted
11	MOH with 12-minute timeout Granted
12	MOH with 16-minute timeout Granted
13	MOH with indefinite timeout Granted
14	MOH Request denied. Future requests will also be denied during this session.

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6.8.5 PCM upstream ignore (+PIG)

Parameter

+PIG=[<value>]

Description

This extended-format compound numeric parameter controls the use of PCM upstream in a V.92 DCE.

Defined values

See Table 35.

Table 35/V.250 – PCM upstream ignore values

<value>	Description
0	Enable PCM upstream
1	Disable PCM upstream

Default setting

0

Read syntax

+PIG?

The DCE shall transmit a line of information text to the DTE, consisting of:

+PIG: <current setting>

For example, with the default setting, the DCE could report:

+PIG: 0

Test syntax

+PIG=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+PIG: (list of supported values)

For example, a DCE that supported all defined settings would report:

+PIG: (0,1)

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6.8.6 V.92 Modem on Hold Hook Flash (+PMHF)

Parameter

+PMHF

Description

This command causes the DCE to go on-hook for a specified period of time, and then return on-hook. The specified period of time is normally one-half second, but may be governed by national regulations. If this command is initiated and the modem is not On Hold, **ERROR** is returned. This command applies only to V.92 Modem on Hold.

Defined values

None.

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6.8.7 V.92 Phase 1 and Phase 2 Control (+PQC)

Parameter

+PQC=<value>

Description

This extended-format compound numeric parameter controls the global enabling or disabling of the V.92 shortened Phase 1 and Phase 2 startup procedures, not the initiation thereof. This command is used in conjunction with the +PSS command.

Defined values

See Table 36.

Table 36/V.250 – Phase 1 and Phase 2 values

<value>	Description
0	Enable Short Phase 1 and Short Phase 2
1	Enable Short Phase 1
2	Enable Short Phase 2
3	Disable short Phase 1 and Short Phase 2

Default setting

0

Read syntax

+PQC?

The DCE shall transmit a line of information text to the DTE, consisting of:

+PQC: <current setting>

For example, with the default setting, the DCE could report:

+PQC: 0

Test syntax

+PQC=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+PQC: (list of supported values)

For example, a DCE that supported all defined settings would report:

+PQC: (0,1,2,3)

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6.8.8 Use Short Sequence (+PSS)

Parameter

+PSS=<value>

Description

This extended-format compound numeric parameter causes a calling DCE to force either a V.92 short or full startup sequence as defined by the +PQC command on the next and subsequent connections.

Defined values

See Table 37.

Table 37/V.250 – Use Short Sequence Values

<value>	Description
0	The DCEs decide whether or not to use the short startup procedures. The short startup procedures shall only be used if enabled by the +PQC command.
1	Forces the use of the short startup procedures on the next and subsequent connections if they are enabled by the +PQC command.
2	Forces the use of the full startup procedures on the next and subsequent connections independent of the setting of the +PQC command.

Default setting

0

Read syntax

+PSS?

The DCE shall transmit a line of information text to the DTE, consisting of:

+PSS: <current setting>

For example, with the default setting, the DCE could report:

+PSS: 0

Text syntax

+PSS=?

The DCE shall transmit a string of information text to the DTE, consisting of:

+PSS: (list of supported values)

For example, a DCE that supported all defined settings would report:

+PSS: (0,1,2)

Implementation

Implementation of this parameter is mandatory if V.92 is implemented in the DCE.

6) New clause 6.9 – Additional commands to support ITU-T V.59

This clause adds new commands to support ITU-T V.59. *Add the following text as clause 6.9: V.59 Command:*

6.9 V.59 command (+TMO)

This extended-format command causes the DCE to transmit one or more lines of information text in specific formats. The command retrieves the information from the managed objects in ITU-T V.59. The command can be used in three ways as described in the following clauses.

6.9.1 Repeat last +TMO command

Syntax

+TMO

Description

The +TMO command without extensions will cause the DCE to repeat the last +TMO command that was issued.

6.9.2 Retrieve diagnostic supported

Syntax

+TMO [<list level><n>]=?

Defined list levels:

- 0 The DCE shall transmit information text which reports the list of all objects support as defined in ITU-T V.59.
- 1 The DCE shall transmit information text which reports the list of all high level objects supported as defined in ITU-T V.59.
- 2 The DCE shall transmit information text which reports the list of all mid-level objects supported as defined in ITU-T V.59.
- 3 The DCE shall transmit information text which reports the list of all low-level objects supported as defined in ITU-T V.59.
- 4 The DCE shall transmit 0 if it supports object names and 1 if it supports tagIDs.

Defined <n>:

- n if present, the object names are returned, if not present, tagIDs are returned. n shall not be used with list level 4. If a DCE supports only tagIDs and n is included with the +TMO command **ERROR** will be returned.

For example, a DCE that supported both object names and tagIDs would report:

+TMO 4=? (0,1)

6.9.3 Retrieve specific diagnostic information

Syntax

+TMO <tagID or Name> <all or only>

Description

This command retrieves the diagnostic identified by either the V.59 tagID or the name. The response from the DCE shall be in the same form as the request, i.e. a tagID will return a response identified by the tagID. A named diagnostic will return the name and the requested information <all or only> specifies if any or all sub-objects of a high or mid-level objects are returned in response to the command.

For example:

+TMO <Name> <all or only>

+TMO V92 All would return all the diagnostics defined for V.92 in V.59

+TMO V92 rxHistory would only return the rx rate history of the V.92 diagnostic as defined in V.59

+TMO <tagID> <all or only>

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