Technical Document

LOW LEVEL DESIGN OF PACKET-ORIENTED I/O FOR IP

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Important Notice

Change History

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Notes:

1. Initial version
2. Update establishment MSC

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[ISO 9000:2000] International Organization for Standardization. Quality management systems - Fundamentals and vocabulary. December 2000

References, Abbreviations, Terms

[GSM07.07] ETSI TS 100 916 V7.5.0: Technical Specification Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME) (GSM 07.07 version 7.5.0 Release 1998). 1999.

[GSM07.10] ETSI TS 101 369: Digital cellular telecommunications system (Phase 2+); Terminal Equipment to Mobile Station (TE-MS) multiplexer protocol (GSM 07.10 version 7.1.0 Release 1998). 1999.

[RFC791] RFC 791: Internet Protocol – DARPA Internet Program Protocol Specification. Jon Postel; 1981.

[RFC1661] RFC 1661: Point-to-Point Protocol. William A. Simpson (ed.); 1994.

[SWPU012A] OMAP710 GSM/GPRS Multimedia Processor Technical Reference Manual. Texas Instruments; 2002

[USB1.1] Universal Serial Bus Specification, Revision 1.1. Compaq, Intel, Microsoft, NEC; 1998.

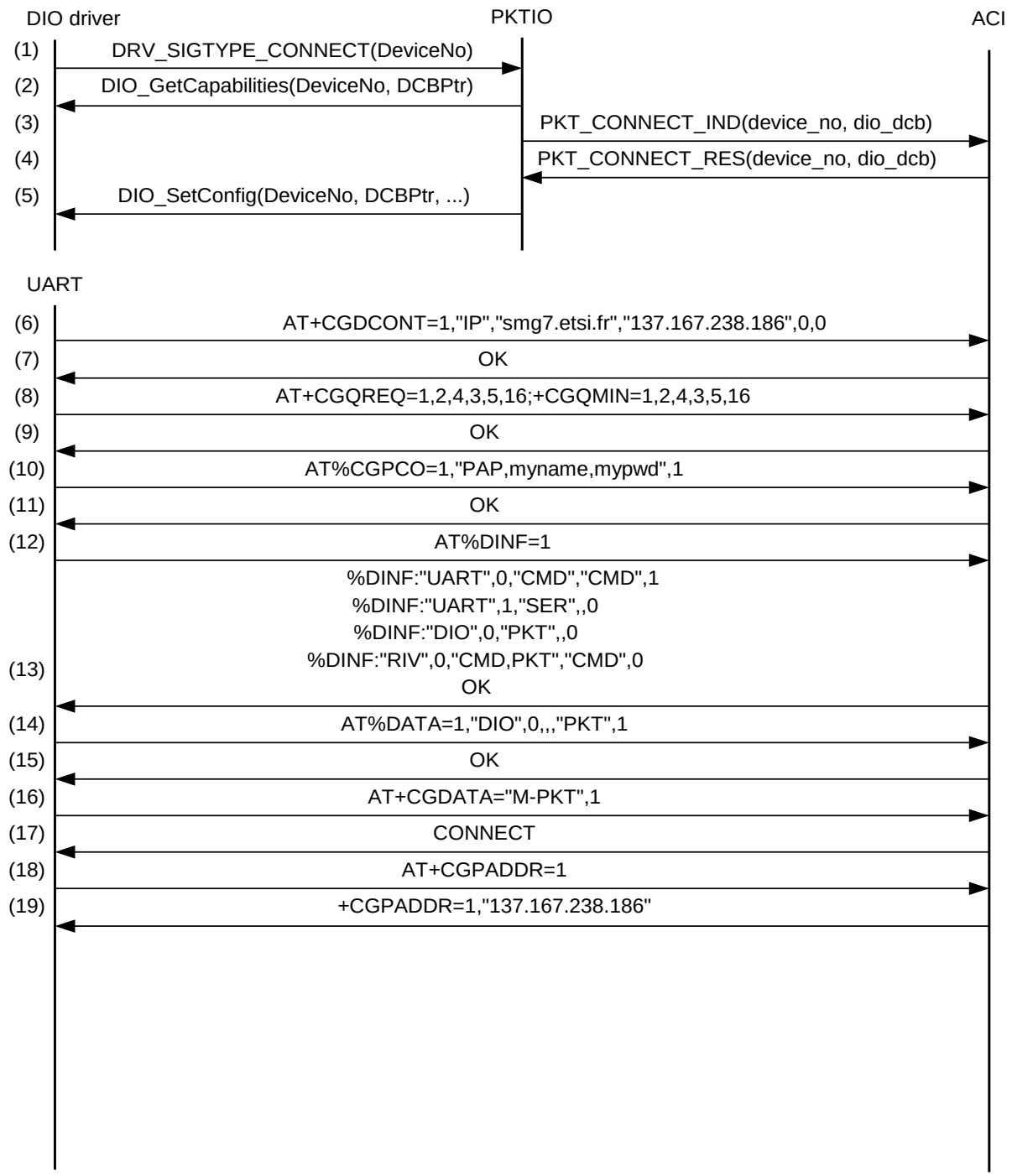
[USB2.0] Universal Serial Bus Specification, Revision 2.0. Compaq, Hewlett-Packard, Intel, Lucent, Microsoft, NEC, Philips; 2000.

DTI Data Transmission Interface; the G23 mechanism for transmission of user data on dynamically configured connections

1 Message Sequence Charts

1.1 Connection Establishment

1.1.1 MSC


DIO driver
PKTIO
ACI
(1) DRV_SIGTYPE_CONNECT(DeviceNo)
(2) DIO_GetCapabilities(DeviceNo, DCBPtr)
(3) PKT_CONNECT_IND(device_no, dio_dcb)
(4) PKT_CONNECT_RES(device_no, dio_dcb)
(5) DIO_SetConfig(DeviceNo, DCBPtr, ...)
UART
(6) AT+CGDCONT=1,"IP","smg7.etsi.fr","137.167.238.186",0,0
(7) OK
(8) AT+CGQREQ=1,2,4,3,5,16;+CGQMIN=1,2,4,3,5,16
(9) OK
(10) AT%CGPCO=1,"PAP,myname,mypwd",1
(11) OK
(12) AT%DINF=1
(13) %DINF:"UART",0,"CMD","CMD",1
%DINF:"UART",1,"SER",,0
%DINF:"DIO",0,"PKT",,0
%DINF:"RIV",0,"CMD,PKT","CMD",0
OK
(14) AT%DATA=1,"DIO",0,,,"PKT",1
(15) OK
(16) AT+CGDATA="M-PKT",1
(17) CONNECT
(18) AT+CGPADDR=1
(19) +CGPADDR=1,"137.167.238.186"

1.1.2 Comments

(1) callback function with signal type DRV_SIGTYPE_CONNECT

This signal is indicated when the driver requests to open a new device. The driver provides the parameter **DeviceNo**. This is needed to get access to the device in subsequent function calls.

(2) function DIO_GetCapabilities() – Retrieve device capabilities

This function is used to retrieve the capabilities of a device, selected by the given parameter **DeviceNo**. The capabilities are returned in the device control block provided by parameter **DCBPtr**.

(3) primitive PKT_CONNECT_IND

This primitive is used to indicate the device that will be opened (selected by parameter **device_no**) and the capabilities of the device (given in parameter **dio_dcb**).

(4) primitive PKT_CONNECT_RES

This primitive is sent by ACI to the PKTIO entity to response to the indicated connection (selected by parameter **device_no**). The actual connection parameters (e.g. selected baud rate for the channel) are included in the parameter **dio_dcb**.

(5) function DIO_SetConfig()

This function is used to configure the device (port, transmission rate, flow control, etc) selected by the parameter **DeviceNo**.

Parameter **DCBPtr** points to a device control block. The parameters that are configured are included in the device control block.

Parameter **Buffers** is a pointer to an array of pointer to send and receive buffer and not used in the procedure above (as indicated by "..."). The parameter will only be used when a multiplexer is started.

(6) AT command AT+CGDCONT=1,"IP","smg7.etsi.fr","137.167.238.186",0,0

The command specifies PDP context parameter values for a PDP context.

Parameter '1' indicates the context identifier, "IP" the PDP type, "smg7.etsi.fr" is the APN, "137.167.238.186" is the requested client IP address, the two '0' indicate that data compression and header compression are not requested.

(7) ACI returns OK

(8) AT commands AT+CGQREQ=1,2,4,3,5,16;+CGQMIN=1,2,4,3,5,16

CGQREQ sets the requested quality of service. CGQMIN sets the minimum quality of service.

Parameter '1' indicates the affected cid, '2' is the precedence, '4' the delay class, '3' the reliability, '5' the peak throughput, 16 the mean throughput.

Note: these commands may be omitted. Then subscribed quality of service will be requested by the mobile station.

(9) ACI returns OK

(10) AT%CGPCO=1,"PAP,myname,mypwd",1

The command triggers the creation of a Protocol Configuration Options buffer that will be sent to the network for authentication.

Parameter ('1' is the format; the string names authentication protocol, user, pwd; the second '1' gives the context identifier.)

(11) ACI returns OK

(12) AT command AT%DINF=1

The AT command is sent by the application processor side to ask for a list of configured channels.

Parameter '1' means: all configured channels shall be reported. A '0' would mean: only information is requested about the current driver on which the AT command is sent.

Note: this command may be omitted if only one channel is used on the DIO driver.

(13) AT response %DINF:"UART",0,"CMD","CMD",1

The information requested with AT%DINF=1 is now provided by ACI. Each line represents one channel.

First line:

"UART" is the name of the used driver,

'0' indicates the device number on the given driver,

"CMD" indicates the data type capabilities of the driver,

the second "CMD" indicates the current setting (if left out, no current setting is available),

'1' indicates that the reported channel is equal to the channel that was used to sent the AT command. ('0' would mean that the reported channel is not equal to the channel that was used to sent the AT command).

Lines 2 to 4 work accordingly. Line 2 shows the UART channel used for serial data transfer, line 3 is the new channel provided by the DIO driver, line 4 shows the Riviera trace channel disguised as a "virtual" driver.

The last line of the AT response is the 'OK'.

(14) AT command AT%DATA=1,"DIO",0,,,"PKT",1

The command is used to link a controlled channel for data transfer, a controlling AT channel and possibly a context identifier. Parameters:

'1' means the link is going to be activated ('0' would mean that the link is going to be canceled).

"DIO" names the driver for the data channel,

'0' is the device number of the data channel on the driver,

now 2 parameters are left out between the commas (that means the controlling channel is the one that transmitted the current AT command),

'1' indicates the cid or context identifier (used in AT commands to identify a GPRS PDP context). A numeric parameter which specifies a particular PDP context definition (see +CGDCONT command in GSM 7.07).

(15) ACI returns OK

(16) AT command AT+CGDATA="M-PKT",1

The application side uses this AT command to activate a GPRS PDP context and perform whatever actions are necessary to establish communication between the TE and the network.

Parameters:

"M-PKT", a string parameter that indicates the layer 2 protocol to be used between the TE and MT (here the manufacturer specific value for PKTIO is provided,

'1' indicates the context identifier of the context that is to be activated.

(17) ACI returns CONNECT

(18) AT command AT+CGPADDR=1

The command requests the client address for a given cid, in this case '1'.

(19) +CGPADDR=1,"137.167.238.186"

returns the address for the cid '1'.

[Still Missing: the AT command which requests the DNS information from ACI. Will be provided by ACI team asap.]

Appendices

A. Acronyms

DS-WCDMA	Direct Sequence/Spread Wideband Code Division Multiple Access

B. Glossary

International Mobile Telecommunication 2000 (IMT-2000/ITU-2000)	Formerly referred to as FPLMTS (Future Public Land-Mobile Telephone System), this is the ITU's specification/family of standards for 3G. This initiative provides a global infrastructure through both satellite and terrestrial systems, for fixed and mobile phone users. The family of standards is a framework comprising a mix/blend of systems providing global roaming. <URL: http://www.imt-2000.org/>