

Softcon System Links

Revision 01.11

INDEX

1	GENERAL	2
2	DATA STRUCTURE	3
3	COMMAND SUMMARY	4
4	DATA EDIT (ALSO TYPE ASSET)	6
5	ACCESS CONTROL	7
6	INPUT / OUTPUT	8
7	ASSET TRACKING (ONLY TYPE ASSET).....	9
8	VENDING.....	9
9	CCTV	11
10	APPENDIX CHECKSUM CODE SAMPLE.....	12

1 GENERAL

The Softcon program SCS_Client can link to external (host) systems via TCP or UDP or serial links, transferring and receiving data in “real time” as events occur.

Currently two types of Softcon links are available (to be incorporated in to one later):

1. The type Softcon functions with multi-servers, SCS_Clients sends commands to and receives replies from hosts (host program does not initiate data transfer). Currently the asset functions described below do not function for type Softcon.
2. The type Asset runs as a separate client program and serves as a single server receiving and sending data with a host program (data transfer initiated by host or SoftWin3). Currently only data edit and asset tracking commands listed below function.

The **TCP/IP** address of the PC where the linked system SW is running is set and could be on the same PC. The **Port** used by the linked SW is set, identifying the link and must be greater than 700. Softcon programs use port addresses 2555 to 2570. If **Auto Start** is set, SCS_Client automatically connects to the linked system on start-up, start and stop selections can be made in the Set-up menu that established or terminates the link.

When a serial link is used, the COM port, baud rate and parity is set.

All correct messages require a reply and all messages end with a sequence number and a checksum. If the checksum is incorrect, the message is ignored with no reply and the Softcon system does a repeat after 1 second. After an unsuccessful repeat, the message is aborted. The sequence number is incremented for each new message per reader, with repeats using the same sequence number. If consecutive correct messages are received from a reader with the same sequence number, the message is ignored as a new message – a reply is still given (e.g. a vend done message could be correctly received, but the reply could be received incorrectly, this will result in the vended message being repeated with the same sequence number – but not seen as a new message, a reply is given).

In this document, data in **GREEN** is changes to the original specification. Data in **RED** is new requirements that have not been implemented.

2 DATA STRUCTURE

Messages consists of an ASCII string, characters such as '[' (5BHex), ']' (5DHex), '~' (7EHex) and '|' (7CHex) are used as separators allowing variable length and to make data readable with testing. As '|' (7CHex) is reserved as a separator it cannot be used as data – should it be required in a string, start and end the parameter with “.

<STX>COMMAND[PARAMETERS]ECHODATA~SEQ|SUM<ETX>

<STX>	02Hex
COMMAND	T+4 digit code (Softcon send – data transmitted from Softcon). R+4 digit code (Host send – data received by Softcon)
PARAMETERS	Parameters as required by the command
ECHODATA	Data echoed back as is with the reply
SEQ	One digit message sequence number 1 to 9 for the reader. New message uses the next number, a repeat uses the same.
SUM	The least significant two digits of the sum all the data excluding STX, ETX and SUM. See appendix for code example.
<ETX>	03Hex

Every command received (T message) must be replied to (R message). If the command is unknown to the receiver, the reserved message Rxx99[xxyy] is replied, where xx is the first 2 digits of the T message and yy the last 2 digits of the T message. The only exception is the disconnect message which will result in disconnect (reply is not expected and is ignored). For backward compatibility, additional parameters added in future versions are added to the back of the parameters and should parameters be removed – null parameters are sent (i.e. ||).

DISCONNECT

When the client program closes, it sends the disconnect message:

To TCP: T9999[]

3 COMMAND SUMMARY

COMMAND TO	COMMAND REPLY	EVENT
T0000[Rno Cno]	R0000[Rno Cno Cname Cval Csub]	Vend card request (funds request)
	R0001[Rno Cno]	Vend card not found
T0100[Rno Ino]	R0100[Rno Ino Iname lval lsub]	Vend Item request (price request)
	R0101[Rno Ino]	Vend Item not found
T0200[Rno Cno Ino]	R0200[Rno Cno Cname Cval Csub Ino Iname lval lsub]	Vend request (host control)
	R0201[Rno Cno Ino]	Vend request card not found
	R0202[Rno Cno Ino]	Vend request item not found
	R0203[Rno Cno Cname Cval Csub Ino Iname lval lsub]	Vend request insufficient funds
T0300[Rno Cno Ino lval lsub YYYYMMDDhhmmss]	R0300[Rno Cno Cname Cval Csub Ino]	Vend done (local control)
T0400[Rno Cno Ino YYYYMMDDhhmmss]	R0400[Rno Cno Cname Cval Csub Ino Iname lval lsub]	Vend done (host control)
T0500[Rno Cno YYYYMMDDhhmmss PCno]	R0500[Rno Cno PCno]	Card entered
T0600[Rno Cno YYYYMMDDhhmmss]	R0600[Rno Cno Card holders name]	Card enter request
	R06xx[Rno Cno Error message]	Card enter request error
T0700[ino Ino YYYYMMDDhhmmss]	R0700[ino Ino]	Input changed
T0800[ono Ino YYYYMMDDhhmmss]	R0800[ono Ino]	Output changed
T0900[ono Ino]	T0900[ono Ino]	Change output
T1000[Rno Cno lval YYYYMMDDhhmmss]	R1000[Rno Cno Cname Cval Csub lval]	Cash loaded
T1100[PCno Cno YYYYMMDDhhmmss]	R1100[PCno Cno Card holders name]	POS request
	R1199[PCno Cno CardType Points Holders name Message]	POS request error
	R11xx[PCno Cno Error message]	POS request error
T1200[PCno Cref YYYYMMDDhhmmss f1 f2 fx]	R1200[PCno Cref]	Card data edit
T1300[Vno Aref Lno YYYYMMDDhhmmss Vtype Ano Asset name Cref]	R1300[Vno Aref Lno]	Asset violation from external
T1400[Vno Aref Lno YYYYMMDDhhmmss]	R1400[Vno Aref Lno]	Asset violation cleared
T1500[Rno Cref Cno Cissue Cname CamRef ? YYYYMMDDhhmmss]	R1500[Rno Cref CamRef]	Card at reader
T1600[Rno Cref Cno Cissue Cname CamRef ? Message]	R1600[Rno Cref CamRef]	Card ext access req
R1601[Rno Cref CamRef ?]	R1601[Rno Cref CamRef]	Card ext access reply
T1700[ENo EStat EXef EVal YYYYMMDDhhmmss Cno]	R1700[ENo EStat]	Reader event
T1800[ENo EStat EXef EVal YYYYMMDDhhmmss]	R1800[ENo EStat]	Controller event
T2000[Table ID SQL]	R2000[Table ID data data ...]	Read database
	R2001[]	Error
T2100[Table ID sql]	R2100[]	OK
	R2001[]	Error
T2200[PCno Rno Line 1 Line 2]	R2200[PCno Rno]	Display data
T2300[PCno Rno path and file name.jpg]	R2300[PCno Rno]	Display photo
T9990[]	No reply	SCS_Socket
T9991[]	Reserved for type Tsogo	SCS_Client Socket
T9992[]	Reserved for type Tsogo	SCS_PPos Socket
T9993[PingValue PingPeriod]	R9993[PingValue PingPeriod]	SCS_Client ping options
T9999[]	Disconnect. No reply	Disconnect

Abbreviations in this document:

Ano:	Asset number
Aref:	Asset reference number
CamRef:	Camera reference number
Cname:	Card holders name
Cno:	Card number or Softcon database reference number (set-up option)
Cref:	Softcon database reference number
Csub:	Card subsidy available in units (zero if not used)
Cval:	Card value available in units (e.g. 1250 for R12.50)
Echox:	Data that is simply echoed back in the reply
ENo:	Event Number field
EStat:	Event Status field
EVal:	Event Value field
EXref:	Event Xref field
Ino:	Item number
Iname:	Item name
Ival:	Item value in units
Isub:	Item subsidy in units (zero if not used)
Lno:	Location number
PCno:	PC number
Pref:	Primary key reference
QRef:	Reference to a query (in the query table)
Qsearch:	Search data used for the query
Rno:	Reader number
ino:	Input number
ono:	Output number
lno:	Level number (generally 1=closed, 2=open)
Vno:	Violation number
Vtype:	Violation type
iLevel:	Input Level
oLevel:	Output Level

4 DATA EDIT (Also type Asset)

When data in card data is edited, message is sent to external link if table EXT_DATA exists in database.mdb. This table has fields listing the field name, order and mask of data sent to the external link (f1, f2..fx parameters below). The mask sets the number of characters and character stuffing if required (character and position – back/front).

CARD DATA TO EXTERNAL

To TCP: T1200[PCno|Cref|YYYYMMDDhhmmss|f1|f2|fx]

Typically: T1200[PCno|Cref|YYYYMMDDhhmmss|employ number|surname|first name|dept number|card number|card status]
Status: 0=disabled, 1=enabled, 2=capture

OK Reply: R1200[PCno|Cref]
Updates the host card database.

Error Reply: R1201[PCno|Cref|Error]

5 DATA READ / WRITE

Data can be read from or written to a database with reference to the table via the table ID – see the table “TABLES” in c:\softwin3\config\database.mdb \table. On ID typically is DBT_CD for the card database.

For date-time fields, the syntax for MS Access is #yyyy/mm/dd hh:mm:ss# (starts and ends with #) and for SQL server the syntax is 'yyyy/mm/dd hh:mm:ss' (starts and ends with single quote).

Forbidden characters in field and table names string are:

Dec	Hex	Char
27	1B	[
29	1D]
40	28	(
41	29)
44	2C	,
46	2E	.
96	60	'

READ DATABASE DATA

This message reads data from a database. The query reference selects setting in the SQL string. Optional additional data can be added that is simply echoed back. Only 1 record is read – e.g. where reference<3 will only read the 1st record as returned by SQL.

To TCP: T2000[Table ID|SQL string]

OK Reply: R2000[data|data|data]
Error Reply: R2001[Table ID]

Typically: T2000[DBT_CD|SELECT NAME,CD_ISSUE FROM CARD_DATA WHERE REFERENCE=1]-5|10
R2000[zCard 001|#2008/04/29 21:08:00#]-5|86

WRITE DATABASE DATA

This message writes data to a database. The query is set in the SQL string. The first data field selects whether the RAM lookup table must be reloaded (data is 1) or not (data is 0) after the new data has been set. When inserting a new record, all the unique fields must be given.

ACCEPTABLE QUERY	REMARKS
INSERT INTO table_name (field1,field2,...,fieldN) VALUES (value1,value2,...,valueN)	This query requires primary key value.
UPDATE table_name SET field1=value1,field2=value2,...,fieldN=valueN WHERE condition	
DELETE FROM table_name WHERE condition	

To TCP: T2100[reload RAM|Table ID|SQL string]

OK Reply: R2100[Table ID]

Error Reply: R2101[Table ID]

Typically: T2100[1|DBT_CD|UPDATE CARD_DATA SET NAME='Mark',CD_ISSUE=#2007/01/25 15:16:17#
WHERE REFERENCE=1]-7|34
R2100[DBT_CD]-7|16

Typically: T2100[1|DBT_CD|INSERT INTO CARD_DATA (REFERENCE,NAME,CD_ISSUE) VALUES
(1000,'Card 1000',#2007/01/25 15:16:17#)]-8|79
R2100[DBT_CD]-8|17

6 ACCESS CONTROL

Card entered: T0500[Rno|Cno|YYYYMMDDhhmmss|PCno]

OK Reply: R0500[Rno|Cno|PCno]

Error Reply: R0501[Rno|Cno|PCno]

Event: t1 nRno s22 xCno (entered)

Event: t1 nRno s39 xCno (duress)

Card enter request: T0600[Rno|Cno|YYYYMMDDhhmmss]

OK Reply: R0600[Rno|Cno|Card holders name] Name is displayed at the reader and door opened

Error Reply: R06xx[Rno|Cno|Error message] Error numbers xx are irrelevant.
Error is displayed at readers and door not opened

Card POS request: T1100[PCno|Cno|YYYYMMDDhhmmss]

OK Reply: R1100[PCno|Cno|Card holders name] Name is displayed at PC and door opened

OK Reply: R1199[PCno|Cno|CardType|Points|Card holders name|Message]
Name is displayed at PC and door opened. Loggs:
Z1 – Computer Number,
Z2-Z5 – Card Number,
Z6 – Passengers,
Z7 – Card Points,
Z8 – CardType

Error Reply: R11xx[PCno|Cno|Error message] Error numbers xx are irrelevant.
Error is displayed at PC and door not opened

Reader event: Events that are logged are sent only if Reader events are enabled in external set-up (event s field is EStat, v field is EVAL, generally the cards trigger group).

T1700[ENo|EStat|EXref|EVal|YYYYMMDDhhmmss|Cno]

OK Reply: R1700[ENo|EStat]

Error Reply: R1701[ENo|EStat]

Event: t1 nENo sEStat xEXref vEVal

Where EStat (see card events in SCS_CLIENT.HLP for updated list):

- 18 Card Absent error.
- 20 Card Out-of-area.
- 21 Card Out-of-time.
- 22 Card Entered.
- 23 Card enabled.
- 24 Card disabled.
- 25 Card Expired.
- 26 Card Wrong PIN.

27	Card set-up.
29	Card APB error.
30	Card Out of count.
31	Card Late entered.
32	Card Captured.
33	Card No host.
34	Card Strictly from error.
35	Card Not found.
36	Set-up APB/strict.
37	Set-up out count.
38	Set-up expire.
39	Card Duress.
43	Parking exit.
44	Wrong card format.
45	Wrong card facility.
46	Card ATB error.
47	Park entry.
48	Park exit.
49	Card not captured.

7 DISPLAY

Display data: Display data on the Reader / PC. If line blank, does not override. The 1st 16 characters are displayed on the standard 16 character LCD. Delay in seconds (0 to 255) sets how long the data is displayed before the LCD reverts back to the normal display (e.g. the real time on the top line). 0 or null indicates normal LCD time-out and 255 indicates forever (i.e. till next display command). The message is displayed on the PC till the next event.

T2200[PCNo|Rno|Line 1 data|Line 1 time-out|Line 2| Line 2 time-out]
 OK Reply: R2200[PCNo|Rno]
 Error Reply: R2201[PCNo|Rno|PCerror|Rerror]

Display Photo: Photo displayed on the PC

T2300[PCNo|Rno|path and file name to the JPG file]
 OK Reply: R2300[PCNo|Rno]

8 INPUT / OUTPUT

Input/output messages could be sourced from Softcon with messages Txx, replies Rxx or sourced from the external system with messages Rxx, Softcon replies Txx.

Input Changed: T0700[ino|lno|YYYYMMDDhhmmss]
 OK Reply: R0700[ino|lno]
 Error Reply: R0701[ino|lno]
 Event: **t**2 **n**ino **s**50 **v**lno

Output Changed: T0800[ono|lno|YYYYMMDDhhmmss]
 OK Reply: R0800[ono|lno]
 Error Reply: R0801[ono|lno]
 Event: **t**3 **n**ono **s**50 **v**lno

Change Output: T0900[ono|lno]
 OK Reply: R0900[ono|lno]
 Error Reply: R0901[ono|lno]
 Event: **t**3 **n**ono **s**53 **v**lno

9 CONTROLLER

Controller events that are logged are sent if enabled in the external set-up. Messages are sourced from Softcon when the event occurs with messages Txx, external replies Rxx.

Controller Event: T1800[ENo|EStat|EXrefl|EVal|YYYYMMDDhhmmss]
 OK Reply: R1800[ENo|EStat]

Error Reply: R1801[ENo|EStat]
 Event: t4 nENo sEStat xEXref vEVal
 Where EStat (see card events in SCS_CLIENT.HLP for updated list):
 1 On-line.
 2 Off-line.
 3 Power-up.

10 ASSET TRACKING (Only type Asset)

Asset Violation (To SCS_Atracksvr.exe from external asset system)

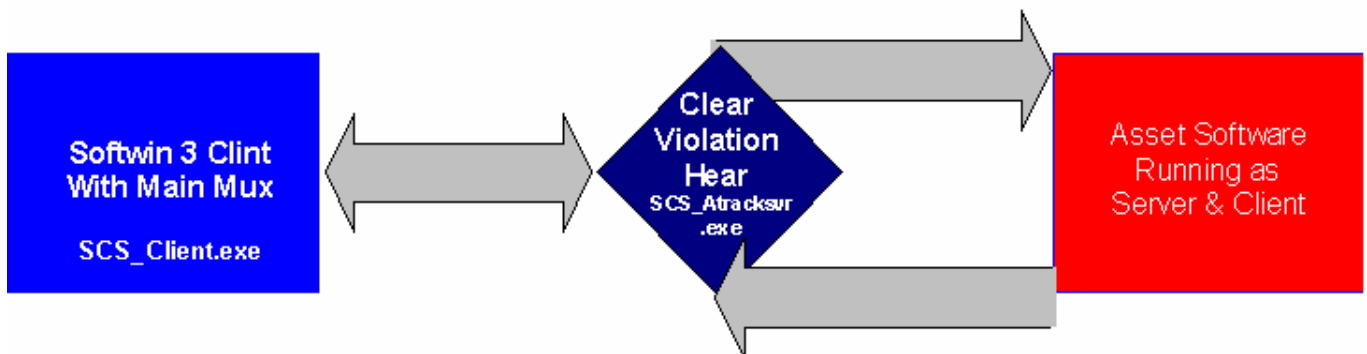
From TCP: T1300[Vno|Aref|Lno|YYYYMMDDhhmmss|Vtype|Ano|Asset name|Cref]
 OK Reply (to TCP): R1300[Vno|Aref|Lno]
 Event: t15 nAref s600 xCref vLno z1Vno z2Vtype a2
 Error Reply (to): R1301[Vno|Aref|Lno|Error]

Asset cleared (From SCS_Atracksvr.exe to Softwin3)

To TCP: T1400[Vno|Aref|Lno|YYYYMMDDhhmmss|Vtype|Cref]
 OK Reply: R1400[Vno|Aref|Lno]
 Event: t15 nAref s601 xCref vLno z1Vno z2Vtype
 Error Reply: R1401[Vno|Aref|Lno|Error]

Asset cleared by Host (From SCS_Atracksvr.exe to external asset system)

From TCP: T1400[Vno|Aref|Lno|YYYYMMDDhhmmss|Vtype|Cref]
 OK Reply: R1400[Vno|Aref|Lno]
 Error Reply: R1401[Vno|Aref|Lno|Error]



11 VENDING

When linking to external systems for vending, the card data is always external. Item data can optionally be external. The Softcon system contains its own item database in all cases. This database is updated from the external system when communication takes place as a result of events at the vending machine. Event logging is done as when no external links are set. Data that is updated in the Softcon databases are indicated in bold, underline.

CARD DATA EXTERNAL (minimum link to external system)

Card Vend data request (funds request):

Vender message: 1
 Clears the card value and subsidy in the Softcon database.
 To TCP: T0000[Rno|Cno]
 OK Reply: R0000[Rno|Cno|Cname|Cval|Csub]

Event: Updates the Softcon card database.
t1 nRno s300 xCno
 Top line display: Card name
 Bottom line displays value and subsidy ("v000-00 s000-00")

Error Reply: R0001[Rno|Cno] CARD NOT FOUND
 Event: **t1 nRno s300 x0**
 Top line display: "Card unknown "

ITEM DATA NOT EXTERNAL

Vend done:

Vender message: **41**
 To TCP T0300[Rno|Cno|Ino|Ival|Isub|YYYYMMDDhhmmss]
 OK Reply: R0300[Rno|Cno|Cname|Cval|Csub|Ino]
 Updates the Softcon card database.
 Event: **t12 nRno s355 xCno z1(Ival+Isub) z2Isub z30 z4Ival z51**

Cash loaded:

Vender message: **10**
 To TCP T1000[Rno|Cno|Ival|YYYYMMDDhhmmss] Ival is the note value
 OK Reply: R1000[Rno|Cno|Cname|Cval|Csub|Ival] Cval is the cards new value
 Updates the Softcon card database.
 Event: **t1 nRno s351 xCno z1Ival z2Cval**

ITEM DATA EXTERNAL (optional link to external system)

Vend Item Data request (item price request):

Vender message: **40 (card 0)**
 Event if item not found in Softcon database:
t1 nRno s301 x0 z1Ikey z2Ikval z30
 Top line display: "Item unknown "
 To TCP item found: T0100[Rno|Ino]
 OK Reply: R0100[Rno|Ino|Iname|Ival|Isub]
 Updates Softcon item database.
 Event: **t1 nRno s301 x0 z1Ikey z2Ikval z3Ino**
 Top line display: Item name
 Bottom line displays item value and subsidy ("c000-00 s000-00")

Error Reply: R0101[Rno|Ino] ITEM NOT FOUND
 Event: **t1 nRno s301 x0 z1Ikey z2Ikval z30**
 Top line display: "Item unknown "

Vend request (host system grants or denies request):

Vender message: **40 (card not 0)**
 Event if item not found:
t1 nRno s301 x0 z1Ikey z2Ikval z30
 Top line display: Item name (R0100) or "Item unknown "
 To TCP item found: T0200[Rno|Cno|Ino]
 OK Reply: R0200[Rno|Cno|Cname|Cval|Csub|Ino|Iname|Ival|Isub] DO VEND
 Updates the Softcon item database.
 Event: **t1 nRno s303 xCno z1Ikey z2Ikval z3Ino z4Ival z5Cval z6Csub**

Error Reply: R0201[Rno|Cno|Ino] CARD NOT FOUND
 Event: **t1 nRno s300 x0**
 Top line display: "Card unknown "

Error Reply: R0202[Rno|Cno|Ino] ITEM NOT FOUND
t1 nRno **s301 x**Cno **z1**lkey **z2**lkval **z30**
 Top line display: "Item unknown "

Failed Reply: R0203[Rno|Cno|**Cname|Cval|Csub**|Ino|**Iname|lval|lsub**] INSUFFIEICIENT FUNDS
 Updates the Softcon item and card database.

Event: **t1 n**Rno **s302 x**Cno **z1**lkey **z2**lkval **z3**Ino
 Top line display: "Check funds "

Vend done:

Vender message: **41**
 To TCP T0400[Rno|Cno|Ino|YYYYMMDDhhmmss]
 OK Reply: R0400[Rno|Cno|Cname|**Cval|Csub**|Ino|**Iname|lval|lsub**]
 Updates the Softcon item and card database.

Event: **t12 n**Ino **s355 x**Cno **z1**(lval+lsub) **z2**lsub **z30 z4**lval **z51**

Cash loaded:

Vender message: **10**
 To TCP T1000[Rno|Cno|lval|YYYYMMDDhhmmss] lval is the note value
 OK Reply: R1000[Rno|Cno|Cname|**Cval|Csub**|lval] Cval is the cards new value
 Updates the Softcon card database.

Event: **t1 n**Rno **s351 x**Cno **z1**lval **z2**Cval

12 CCTV

Card access by Softcon – If a reader has a camera selected (not zero) and the card or reader does not have external access set, then card entered, card out of area, card out of time, card duress messages from controllers generate event s270.

Event: **t1 n**Rno **s270 x**Cref **v**CamRef Not logged
 To TCP T1500[Rno|Cref|Cno|Cissue|Cname|CamRef|?|YYYYMMDDhhmmss]
 ? : 0=No access, 1=Access, 2=Capture.

OK Reply: R1500[Rno|Cref|CamRef]

Card request by Softcon – If a reader has external access set and the card has external access set, the card data is not kept in the controller. Card out of area from controllers generate event s271.

Event: **t1 n**Rno **s271 x**Cref **v**CamRef Event, log, display
 To TCP T1600[Rno|Cref|Cno|Cissue|Cname|CamRef|YYYYMMDDhhmmss|?|Message]
 ? : 1=No Access, 2=Access
 Message: Enabled, Disabled, Expired, Out-of-Area, Host error...

OK Reply: R1600[Rno|Cref|CamRef] Results in next

Card request by Softcon – reply to previous

From TCP: **T1601**[Rno|Cref|CamRef|?|YYYYMMDDhhmmss]
 ? : 0=No access, 1=Access, 2=Capture.

OK Reply: **R1601**[Rno|Cref|CamRef]

Event: **t1 n**Rno **s272 x**Cref **v? z1**CamRef Event, log, display

Note that if the external system does not need CamRef, it simply ignores it. Must be echoed back in the reply.

13 Ping

Ping options by External system link – External system requests ping options (only TCP/IP):

From TCP **T9993**[PingActivate|PingPeriod]

OK Reply: **R9993**[PingActivate|PingPeriod]

PingActive: 0 – deactivates Softcon ping, **not zero** – activates Softcon ping. External link with type Wavetrend – ping always activated.

PingPeriod: format is mmss (minutes, seconds).

Note that Softcon default ping options: Ping is activated, ping period is 0030 (30 seconds).

14 APPENDIX CHECKSUM CODE SAMPLE

```
CString strMsg("T1000[BBBBBB|kkkkkk|0123456|20050131123632]~1|");  
  
long nSum = 0;  
int nLen = strMsg.GetLength();  
  
for (int i = 0; i < nLen; i++)  
{  
    BYTE bh = (BYTE)strMsg.GetAt(i);  
    nSum += bh;  
}  
  
strTemp.Format(_T("%02d"), nSum % 100);  
  
strMsg += strTemp;
```

For example, if sum == 1234 the checksum will be 34, last two digits in string format.