ACK support for chip and PIN for embedded PCs running WinCE operating system

Introduction:

The ACK suite of software modules enable chip and PIN transactions to be accepted through applications running on embedded PC platforms using WinCE operating system. ACK offer both a client component linked to an ACK EFT Server, or a fat client which requires no server.

The ACK software solution controls the following three interfaces:

- Interface with the POS application - sale value details are passed from the POS application to the ACK software to initiate the transaction process: The ACK software provides feedback to the POS application for display to the user at all stages of the process.
- Interface with the Card Acceptance Device (CAD) / PIN pad - the ACK software directly controls the PIN pad and does not use a separate EMV Level 2 component.
- Interface with the card authorisation host service - the ACK software builds the on-line authorisation request which consists of data gathered from both the POS and from the CAD. Full session management and auto-retries are handled by the ACK software.

The POS application developer need therefore only be concerned with the simple task of integrating with the ACK software - all other functions required for a card transaction to be completed are handled by the ACK software.

Summary of Features:

Low system resource requirements:
Small memory footprint
Compact code written in 'C' and C++
No separate EMV Level 2 kernel

Runs on all WinCE operating system:
Win CE (3.2 and above)

Choice of two program interfaces:
ACKTerm - loose-coupled with generic accreditation
EFTRUN - close-coupled and requires end-to-end accreditation

Modular design:
PIN pad / Card reader (CADAPI) driver software available separately (for use with third party EFT solutions)
EFT processing software available separately (for use with third party CAD devices)

Tel: 0118 948 2588, e-mail: enquiries@ackltd.co.uk web site www.ackltd.co.uk.

Operating Systems:

ACK products are written in C and C++ which allows ACK to maintain a common set of software source code which will run on many different target operating systems. These currently include: DOS, Windows 98, WinNT, Windows 2000, Windows XP and WinCE.

Supporting WinCE allows full card validation and authorisation to be conducted from platforms which use embedded PC technology, such as unattended payment terminals and hand-held terminals. ACK have taken care to ensure the software will run on minimum specification hardware - this has been achieved by keeping the code to a small memory footprint and have avoided the additional burden of .NET framework, although C# applications may still access the API.

Software Interfaces:

ACK offer a selection of two interfaces:

1. ACKTerm - User Interface - The ACK application, **ACKTerm**, provides a type-approved, loose-coupled interface which operates as a standalone application and requires minimal system integration. ACKTerm has its own user interface which keeps the operator and card-holder informed of session progress and will prompt for action, such as insertion of card and PIN entry, before seeking on-line authorisation. Pre-formatted receipt data is exported by ACKTerm which the EPOS application will be responsible for printing. Alternatively, the in-built printer on Dione Xplorers can be controlled directly by ACKTerm.
   ACKTerm is suitable for use with all types of EPOS application and requires minimal integration and testing effort before being ready to use live.

2. EFTRUN - class library - offers a close-coupled integration with EPOS applications where a series of methods and properties are used to initiate and monitor progress of a card authorisation request. Events are generated to alert the EPOS application of change in status and to request further information when required. The EPOS application is responsible for user interface and receipt data and is therefore subject to end-to-end accreditation testing before being ready to use live.

Note that single or multiple workstations may be networked together within a local area and one or more gateways will direct authorisation requests directly to the card acquirer, or alternatively, to a third party managed payment system.

Accreditation:

The ACKTerm solution is has been generically accredited with all UK acquiring banks. ACK have been granted self-certification status, along with a duty of care to check that the integration to ACKTerm has been completed correctly. This process takes a few days and once signed off by an ACK test technician, is ready for deployment.

For EFTRUN close-coupled interface, ACK provide a full accreditation service and have a team of highly skilled technicians and project managers who are able to ensure project accreditation times are kept to a minimum.

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The accreditation process includes three key tasks:

1. ACK's expertise and advice on the integration with the POS to ensure the system meets bank and user requirements,
2. ACK expertise in testing - this is a highly skilled process which requires dedication to detail and timely responses to acquirer queries,
3. full project management through which all interested parties (merchant, acquiring bank, POS provider and ACK) are engaged and fully informed through each stage of the integration and accreditation process.

Software Modules:

The full suite of ACK software consists of the following modules which are presented as a unified solution through the above program interfaces, but are also available separately.

CADAPI - Card Acceptance Device API - handles the serial interface to the PIN pad and message interchange and interpretation - this results in a simplified API which is common for all types of PIN pad currently supported (Dione, Ingenico and Trintech). May be used with third-party EFT software and eliminates the need for third party EMV Level 2 software.

CADAPI is also equipped with full device management functions, including:

1. Auto-configuration: Configuration parameters are downloaded without operator intervention - details include TACs, AIDs, Public Keys etc.
2. Auto-update: New micro-code is downloaded without operator intervention or need for separate utilities (Note: Dione devices only)
3. Auto-discovery: PIN pads may be connected to any serial port and will be automatically discovered by CADAPI without the need for manual configuration.

All of the above features greatly simplifies in-service maintenance and allows PIN pads to be hot-swapped without engineer or operator intervention.

ECP - EFT Control Program - performs all off-line card validation routines to determine card and scheme type, checks start/expiry dates and issue numbers for all card types. ECP also builds the authorisation messages (APACS 30 or Datacash) and initiates and manages the entire on-line authorisation session either direct to the acquiring bank or managed service.

In addition to the credit/debit card processing functions, ECP may also be used to handle stored-value cards, for example:

- Cashless systems - accounts may be initiated, loaded, redeemed (full or partial) and account holders can perform balance checks.
- Electronic Gift cards - accounts may be initiated, loaded, redeemed (full or partial) and account holders can perform balance checks.
- Electronic gift vouchers - one-time vouchers may be issued or redeemed.
- Electronic-top-up - mobile phone accounts can be topped up with Alphyra, e-pay or Paypoint.

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Notes:

1. The key to a successful integration is close collaboration between partners: ACK focus on providing partners with the solutions they require and welcome the opportunity to discuss projects in their earlier stages. This helps avoid any potentially limiting factors and will allow realistic expectations to be set for both the integration and accreditation processes.

2. The standard ACK offering is a simple licence fee per installation with annual maintenance as the only on-going fee. This compares favourably with long-term, transaction or subscription based bureau alternatives which appear to be low-cost at first sight, but may escalate rapidly for medium to large installations.