

Microsoft Dynamics® AX 2009

# Credit Card Processing

*Technical White Paper*

This white paper is intended for professionals who are involved in the implementation and support of the Credit Card Processing functionality at a customer site, as well as for those who need to advise customers, or make modifications within the area. The paper offers an overview of the principles used within the Credit Card Processing area of Microsoft Dynamics AX 2009.

*February 2009*

[www.microsoft.com/dynamics/ax](http://www.microsoft.com/dynamics/ax)



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## Introduction

Customers often pay invoices using one or more credit cards. It is common practice to preauthorize the credit card amount at the time of the order and then process the actual charge when the order is shipped and invoiced. Both of these processes, when done manually, are time-consuming. The Credit Card Processing feature in Microsoft Dynamics® AX automates this process.

## Credit Card Processing Feature Concepts

The feature is designed to support credit card processors that can accept approval requests from Microsoft Dynamics AX and return the results back to Microsoft Dynamics AX. Two types of approval requests are supported: 1) preauthorization, in which the invoice amount is set aside by the credit card processor against the cardholder's credit limit and 2) authorization, in which the invoice amount is actually charged to the card holder. Figure 1 illustrates the processes that can be followed when you use this feature:

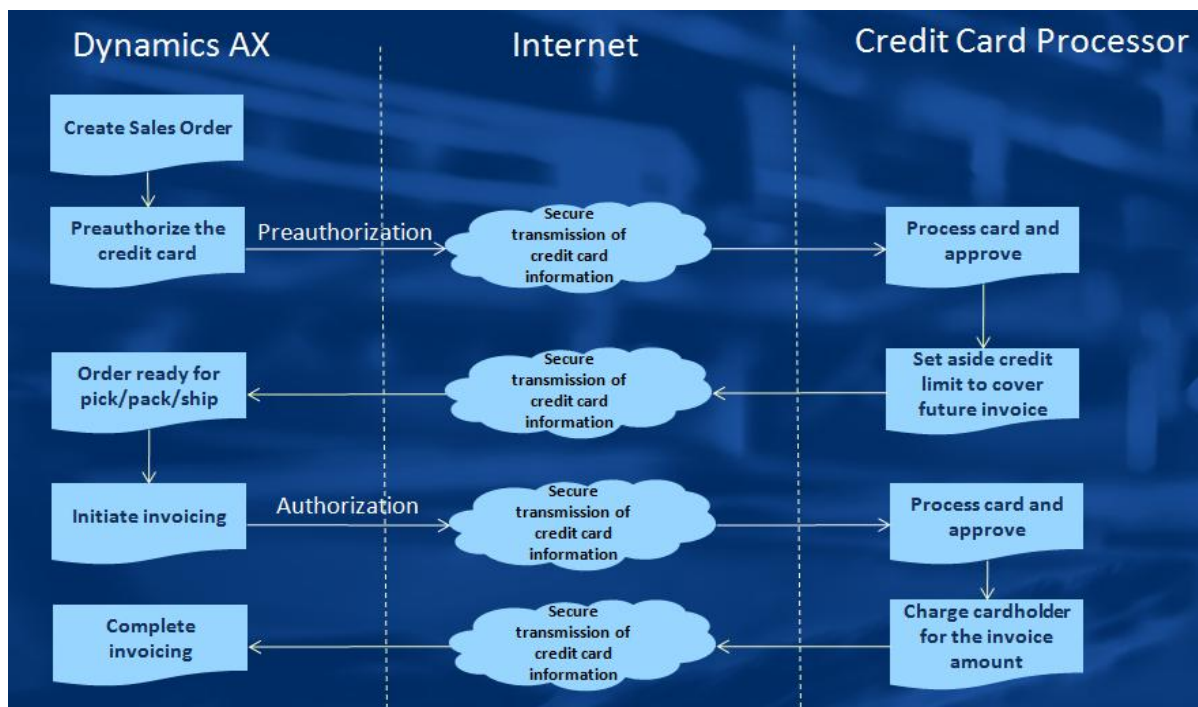


Figure 1: Credit card processing feature concepts

## Setup

The Credit card processing feature is controlled by a General Ledger configuration key called Credit Card. This configuration key is shipped as active with the default installation.

Additional security is provided by a security key called Credit Card, as shown in Figure 2.

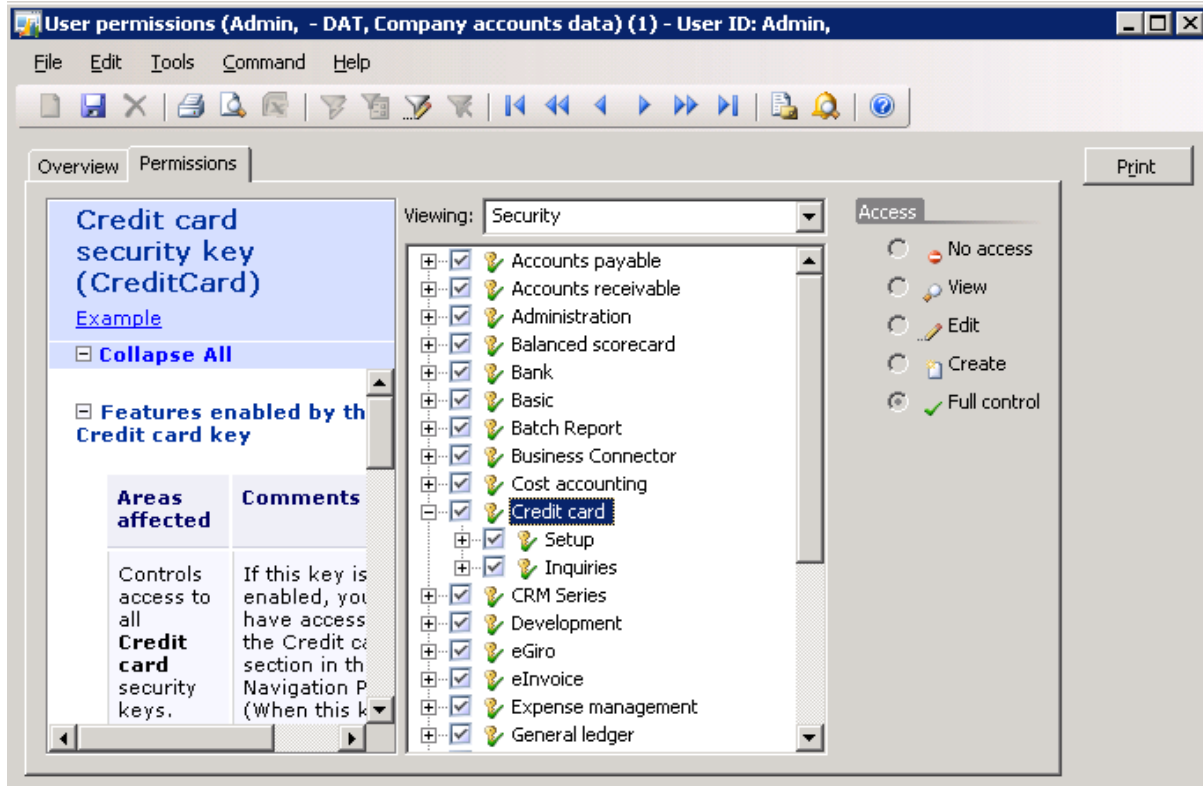


Figure 2: Credit card user permissions

The Setup security key provides access to the Credit card processor form where you can set up the connections to one of the credit card processors. The Inquiries key allows users to add credit cards for a customer, select credit cards in forms, and process credit card transactions. If a user does not have this security, that user will not be able to view or use any credit card features.

The feature requires additional setup steps to be complete using the following forms to configure the process shown in Figure 1:

- Credit card processors
- Terms of payment
- Customers



## Microsoft Dynamics Payment Services

The Microsoft Dynamics Payment Services (MDPS) tab allows you to enter the information required to connect to the MDPS service.

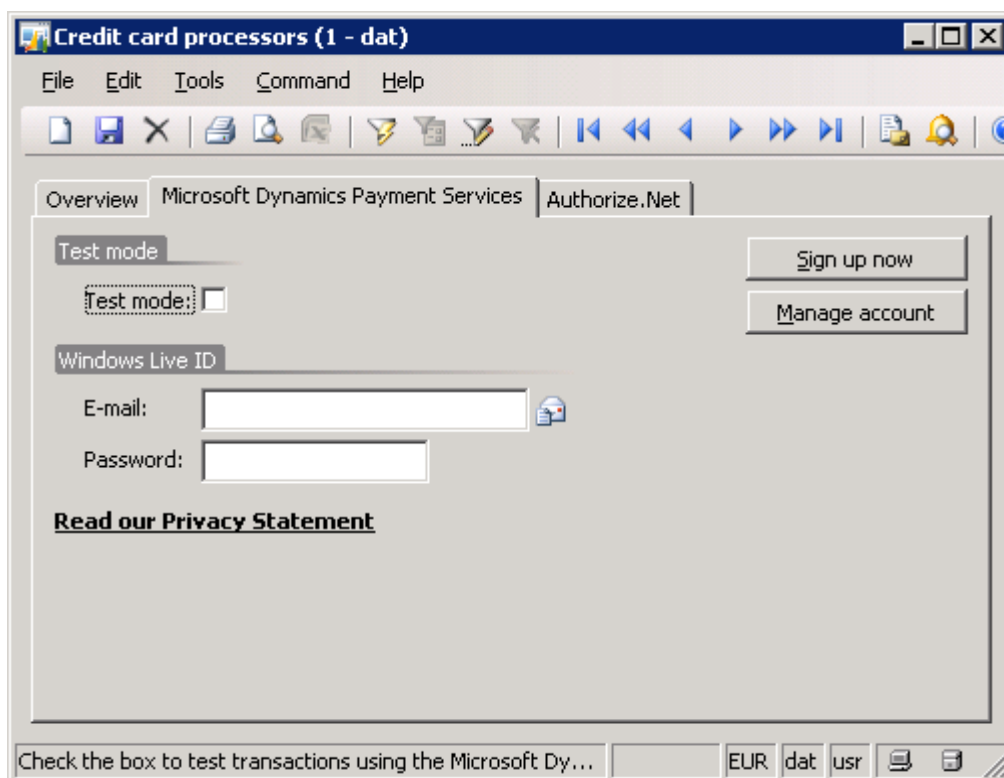


Figure 4: Microsoft Dynamics Payment Services tab

MDPS requires that a Windows Live ID be used to communicate with it. You enter the Windows Live ID and password in this form before you initiate a signup for the service. The Windows Live ID does not need to exist at this time. You can create it during the setup process.

The Sign up now button takes you to the MDPS sign up screen where you can purchase the service. The Manage Account button takes you to the MDPS administrative area so you can manage your MDPS account.

MDPS also has a test mode that allows you to test transactions before you go live. When the check box is cleared, live transactions will be processed by MDPS.

### Demo data

The sign up process for Microsoft Dynamics Payment Services requires a unique GUID. This GUID is created automatically when you open the credit card processors form. However, if you are using demo data, there is already a GUID in the table that you would use to sign up. If you try to sign up with that GUID, the process will fail because the GUID will have already been used.

If you want to change the GUID, you should execute the following steps to ensure that you will have a successful sign-up experience with Microsoft Dynamics Payment Services:

1. Close AX2009
2. Launch Internet Explorer and go to: <https://login.live.com>
3. If you are signed into Window Live, click the "Sign Out" link in the upper right-hand corner.
4. Execute the following SQL command in the SQL Server Management Studio to reset the GUID value:

```
USE DynamicsAx1 (or the name of your AX2009 database)
GO
```

```
UPDATE [CREDITCARDMICROSOFTSETUP]
    SET [SERVICEID] = NEWID()
```

5. Restart the AX2009 Object Service
6. Start AX2009 and perform the MDPS sign-up process.

Once you use this GUID to sign up, you can use the GUID and your Windows Live ID in all instances of your AX2009 demo data to demonstrate the AX2009 interface with Microsoft Dynamics Payment Services.

## Authorize.Net

The Authorize.Net (ADN) tab allows you to enter the information required to connect to the ADN service.

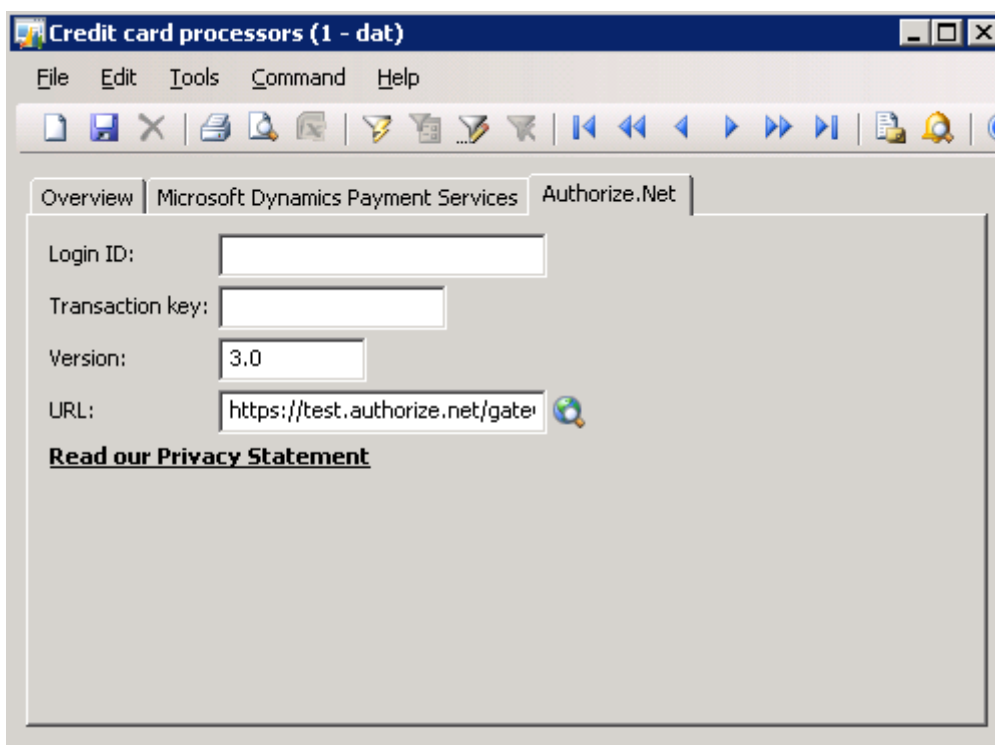


Figure 5: Authorize.Net setup tab

Microsoft Dynamics AX2009 uses the AIM method of integration with ADN. ADN requires a login ID and transaction key (similar to a password) to communicate with it. This login ID and transaction key are not the same as the login ID and password that you use to access your ADN administrative account. You must sign up with Authorize.Net on <http://www.authorize.net> and then obtain these values through their administrative site. You will find the values in the security settings section that is named API Login ID and Transaction Key.

ADN has two test modes that allow you to test transactions. The first test mode is initiated by specifying Test Mode on the ADN administrative site. The second test mode is initiated by turning off Test Mode on the ADN administrative site and then using a test URL (<https://test.authorize.net/gateway/transact.dll>). The second test mode is the required mode for this feature because it returns the same results as a live transaction.

To turn on the live transaction mode, change the URL to <https://secure.authorize.net/gateway/transact.dll>.



## Terms of Payment

The Terms of payment form has been modified to identify the terms of payment that will initiate credit card transactions.

The screenshot shows a software window titled "Terms of payment (1 - dat) - Terms of payment: CASH, Cash". The window has a menu bar with "File", "Edit", "Tools", "Command", and "Help". Below the menu bar is a toolbar with various icons. The main area has tabs for "Overview", "General", "Setup", and "Other". A "Language texts" button is located on the right. The "Credit" section is active, containing a "Certified company check" checkbox, a "Payment type" dropdown menu, and a "Credit check" dropdown menu set to "Normal". At the bottom, there is a checkbox labeled "Check this box if the carrier must be paid by certified check" and a footer with "EUR", "dat", "usr", and some icons.

Figure 6: Terms of payment form

A payment type was added called Credit card. Backward compatibility with earlier versions of Microsoft Dynamics AX is maintained by using a blank payment type. This type does not use credit card functionality when it is selected for a term of payment. By default, all terms of payment are assigned to a blank payment type during the upgrade process.

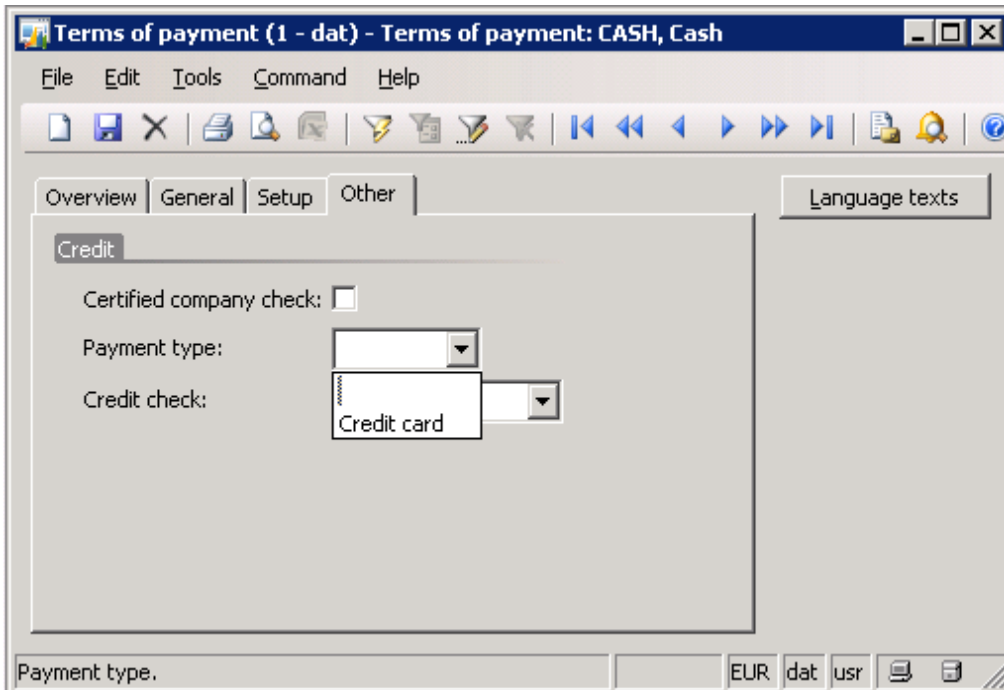


Figure 7: Terms of payment payment type

A credit limit check called Credit check was added to allow you to bypass credit limits when using a credit card. If a customer has exceeded their credit limit and you require the customer to pay by cash or credit card, this field allows you to bypass the credit check when the Bypass credit check value is selected. The Bypass credit check value will be used only when the payment type is Credit card. The value Normal indicates that normal credit checks will be made when this term of payment is used. To maintain backward compatibility with prior versions, the Normal value is assigned during the upgrade by default.

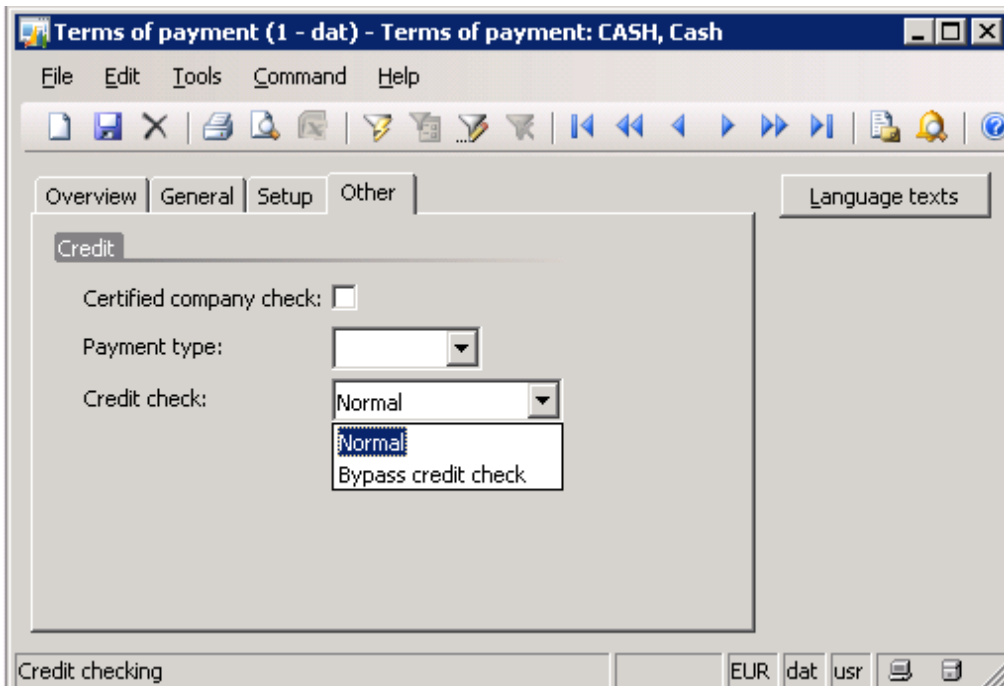


Figure 8: Terms of payment credit check settings

## Customers

Credit card information can be added to a customer account at any time before or during the sales order process. To maintain security, all credit cards must be entered through a credit card wizard. You can access the wizard using the Setup > Credit card button in the Customer form or Sales order form.

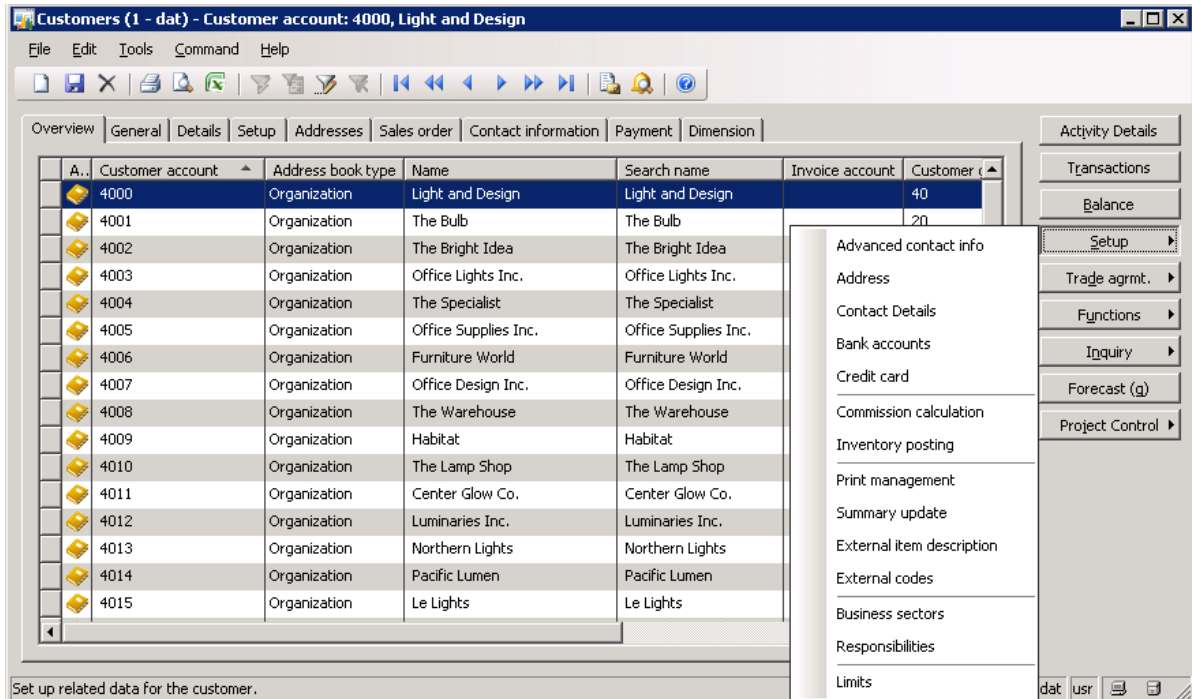


Figure 9: Setting up credit cards from the customer form

When you click Setup > Credit card, the Customer credit cards form displays the existing credit cards for the customer. You can add new credit cards or edit existing credit cards with this form. However, the form does not allow edits directly to the form. All changes must be made through the credit card wizard to increase the level of security provided by the application.

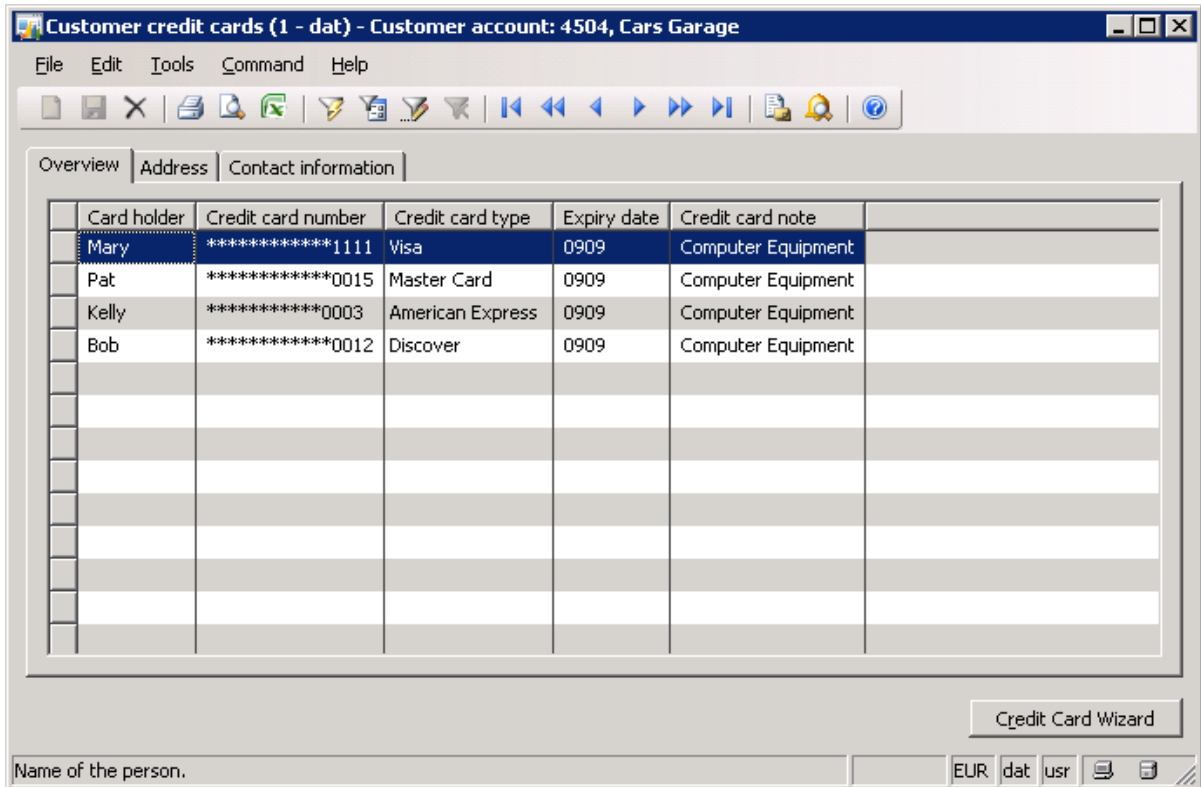


Figure 10: Customer credit cards form

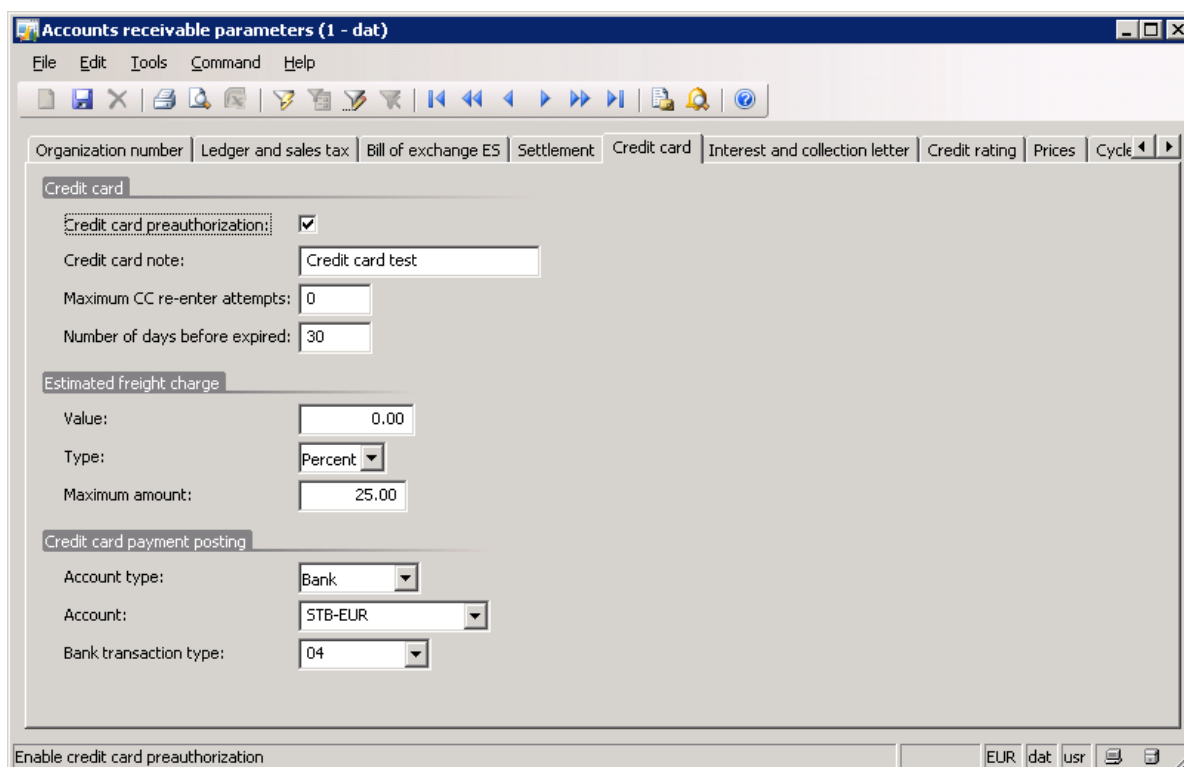
The Credit card wizard is a series of six forms that request card holder information and the credit card number. Once you have completed the wizard, the credit card will appear in the Customer credit card form and be available for use in a sales order.



Figure 11: Credit card wizard

## Credit Card Parameters

A Credit card tab has been added to the Accounts receivable parameters form so you can add default settings that will be used during credit card processing.



The screenshot shows the 'Accounts receivable parameters (1 - dat)' window with the 'Credit card' tab selected. The form is divided into three sections:

- Credit card:**
  - Credit card preauthorization:** A checked checkbox.
  - Credit card note:** A text box containing 'Credit card test'.
  - Maximum CC re-enter attempts:** A text box containing '0'.
  - Number of days before expired:** A text box containing '30'.
- Estimated freight charge:**
  - Value:** A text box containing '0.00'.
  - Type:** A dropdown menu set to 'Percent'.
  - Maximum amount:** A text box containing '25.00'.
- Credit card payment posting:**
  - Account type:** A dropdown menu set to 'Bank'.
  - Account:** A dropdown menu set to 'STB-EUR'.
  - Bank transaction type:** A dropdown menu set to '04'.

At the bottom of the window, there is a checkbox labeled 'Enable credit card preauthorization' which is currently unchecked. The status bar at the bottom right shows 'EUR dat usr'.

Figure 12: Accounts receivable credit card parameters

The Credit card preauthorization check box determines whether or not the credit card will be preauthorized when you process the order. If this check box is cleared, the credit card will not be validated until it is invoiced.

The Credit card note is the default text that will be provided to the credit card processor for use on the customer's credit card statement. This text will be overridden by any text that is entered as a credit note when you create a credit card using the credit card wizard.

The estimated freight charge settings determine the amount of the additional charge that will be added to the credit card preauthorization. In many cases, we do not know the actual freight charges that will be calculated when an order is invoiced, so the estimate ensures that the credit card is preauthorized for a sufficient amount to cover the freight. You can change the type to Percent and a percentage of the order amount before tax up to the maximum amount will be added to the preauthorization. Change the type to Fixed and the Value setting will be used as a fixed amount that will be added to the preauthorization.

The Credit card payment posting group defines the default settings that will be used when the payment journal is posted after a credit card is accepted. These settings can be overridden in the price/discount tab on the sales order payment by selecting different methods of payment.

## Sales Order setup

With this feature, credit cards can be used on sales orders to pay for the order when the invoice is posted. Credit cards are selected in the Price/Discount tab of the sales order.

Card holder	Credit card number	Expiry date	Credit card type	Credit card note
Bob	*****0012	0909	Discover	Computer Equipment
Kelly	*****0003	0909	American Express	Computer Equipment
Mary	*****1111	0909	Visa	Computer Equipment
Pat	*****0015	0909	Master Card	Computer Equipment

Figure 13: Selecting a credit card on the sales order

To use a credit card, you must assign a payment type that has been assigned the Credit card option during setup. Once this payment type is selected, the Credit card number field becomes active and you can select a credit card from the Credit card number lookup. Only one card can be selected for an order and cash discounts will not be applied to the order.

If a credit card does not exist for the customer, you can use the Setup button to select Credit Card Wizard. The credit card wizard is the same wizard discussed previously in the Customers section. Once you have used the wizard to create a credit card, the card number is automatically added to the order.

Sales order	Customer account	Invoice account	Order type	Status	Currency	Project	Blanket order	Customer requisition
00007_036	4009	4009	Sales order	Invoiced	EUR	9005		
00008_036	4010	4010	Sales order	Invoiced	EUR			
00009_036	4009	4009	Sales order	Invoiced	EUR			
00010_036	4000	4000	Sales order	Invoiced	EUR			
00011_036	4006	4006	Sales order	Invoiced	EUR			
00012_036	4002	4002	Sales order	Invoiced	DKK			
00013_036	4004	4004	Sales order	Invoiced	EUR			
00014_036	4007	4007	Sales order	Invoiced	EUR			
00015_036	4008	4008	Sales order	Delivered	EUR	9004		
00016_036	4005	4005	Sales order	Open order	EUR			
00017_036	4010	4010	Sales order	Open order	EUR			
00018_036	4502	4502	Sales order	Open order	USD			

Figure 14: Selecting the credit card wizard on the sales order form

The two credit card processors provided with this feature, Microsoft Dynamics Payment Services and Authorize.Net, support only the USD currency at this time. If you have selected a currency, a method of payment, or a credit card payment posting setting in the Accounts receivable parameters form that results in a currency that is not USD, you will not be able to process the credit card with either of the two credit card processors.

## Processing a preauthorization

If the Credit card preauthorization check box is selected in the Accounts receivable parameters form, the preauthorization will occur automatically if you post the picking list or packing slip. You also can use Functions > Preauthorize to preauthorize the credit card before sending the order to the warehouse for picking or packing.

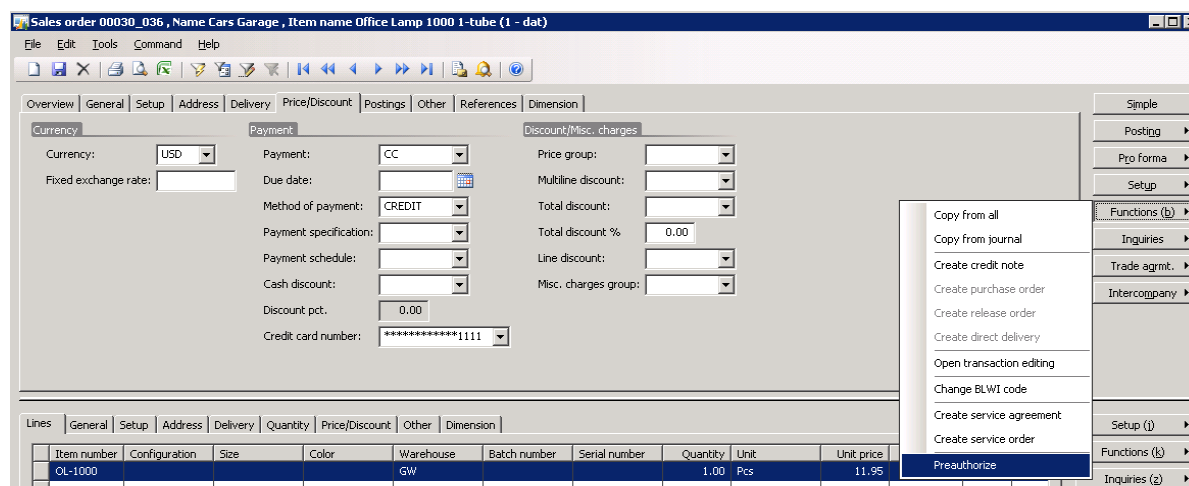


Figure 15: Preauthorizing a sales order

Once the preauthorization is complete, you will receive a dialog box that shows you the result of the preauthorization.

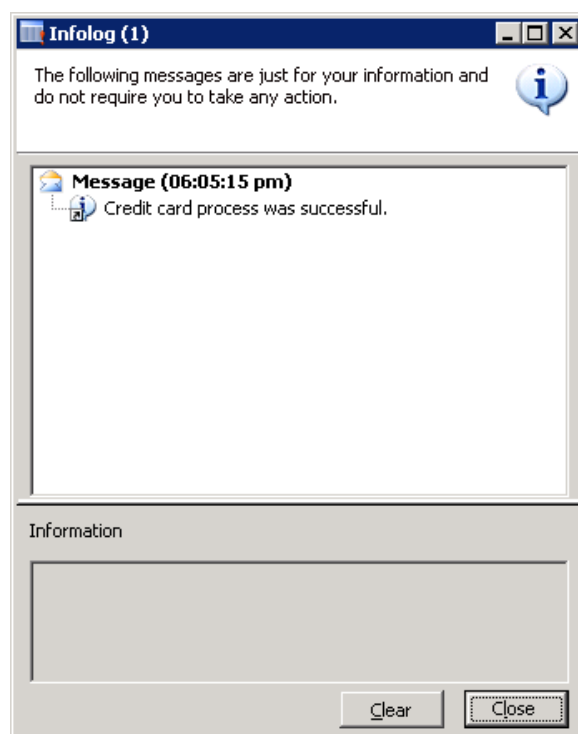




Figure 16: Dialog box showing the results of the credit card process

You can view the details of the preauthorization by clicking Inquiries > Credit card authorization history on the Sales order form.

Credit card number	Type	Status	Authorization code	Reference ID	Amount	Currency	Amount (EUR)	Expired	Void	Description	Credit card processor	Date
*****0003	Preauthorization	Approved	000000321038216	61cc7788-d02d-45bf-ab85-1323e9c06845	11.95	USD	13.75	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Credit card process was successful.	Microsoft Dynamics Payment Services	2/13/2008 06:...

Figure 17: Credit card authorization history

Every attempt to preauthorize or authorize a transaction is stored for the order and displayed on this form. If a transaction is declined or you are having difficulties with the network connection, you will be provided additional information on the dialog box shown in Figure 16 and on this form in the description column.

## Processing an authorization

Credit cards are authorized when the invoice is posted. There are three ways to post invoices that will process the credit card:

- Sales order
- Sales pickup
- Warehouse Shipment

### Sales order

The credit card is authorized automatically when you post the invoice from the sales order form. The dialog box shown in Figure 16 will appear when the credit card has been processed. An additional entry will be added to the credit card authorization history, noting the actual amount charged to the credit card.

Credit card number	Type	Status	Authorization code	Reference ID	Amount	Currency	Amount (EUR)	Expired	Void	Description	Credit card processor	Date
*****1111	Preauthorization	Settled	000000001414765	db1526f0-46cd-4dd7-81d9-45b0b87038b5	11.95	USD	13.75	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Credit card process was successful.	Microsoft Dynamics Payment Services	2/13/2008 04:...
*****1111	Finalization	Approved	000000001414765	db1526f0-46cd-4dd7-81d9-45b0b87038b5	11.95	USD	13.75	<input type="checkbox"/>	<input type="checkbox"/>	Credit card process was successful.	Microsoft Dynamics Payment Services	2/13/2008 04:...

Figure 18: Credit card authorization history

## Sales Pickup (Will Call)

A new form has been added to the Inventory > Common forms menu called Sales Pickup. This form will show all orders that have a mode of delivery in either the sales order header or detail lines that was set up with a Pickup service type. You can also select the All service types check box to display all orders.

Criteria

Service: Pickup All service types:

Overview | Delivery | Credit card

Sales order	Customer account	Name	Invoice account	Ship date	Customer reference	Mode of delivery	Payment	Document status
00024_036	4504	Ca...	4504	2/9/2008		PICK	D30	None

Refresh Data  
Refresh form view  
Shipments  
Packing slip  
Invoice

Lines

Item number	Text	Quantity	Price unit	Unit price	Net amount	Service
OL-1000	Office	1.00	1.00	11.95	11.95	Pickup

Identification of the order. EUR dat usr

Figure 17: Sales pickup form

The form provides basic information about the sales order. The counter person can generate a packing slip and create invoices from this form in the same way that you can through posting in a sales order. Additional refresh buttons are provided so that the counter person can quickly refresh the list with only the orders that have not been invoiced.

The Credit card tab allows the counter person to select a credit card for the customer when they arrive. The credit card must exist on the customer's account. It cannot be entered in this form. When the invoice process is initiated, the credit card is authorized and, if the card is accepted, the invoice process is completed. If the card is declined, the process is stopped and a dialog box is displayed with the decline information.

Figure 18: Sales pickup form – credit card tab

### Warehouse management

An additional buttons has been added to the Shipment form for credit card processing. The Process shipment button will be active when you have used a credit card on an order. Customers using these payment types often want an invoice included in the box. The Process shipment button initiates the invoice posting process, printing the invoice and validating that the invoice can be posted. If a credit card is involved, the credit card is processed. However, the invoice process will be stopped if the credit card is not accepted.

Shipment	Warehouse	Name	Outbound dock	Joint packing	Status	Pick	Pallet tran
000002_100	MW	Same customer	OUT-1	Same customer	Sent	Completed	
000004_100	MW	Same customer	OUT-1	Same customer	Sent	Completed	
000006_100	MW	Same customer	OUT-1	Same customer	Sent	Completed	
000008_100	MW	Same customer	OUT-1	Same customer	Sent	Completed	

Figure 19: Shipment form

## Creating a payment journal

After a credit card is processed, a payment journal is created using the payment journals defined in the credit card processors form. The credit card amount is settled against the invoice and the transaction is posted to the payment journal.

## Batch processing

Invoices that include credit cards can be posted using a batch. The batch log will include the same information about the success or failure of the credit card that is shown in the dialog box shown in Figure 16.

## Merging sales orders

During the posting, you are allowed to merge sales orders into a single invoice based on the invoice account in those orders. The standard behavior for this process is to use the payment terms found in the first order for an invoice account will be applied to all orders. That behavior is used for credit cards as well.

If the first order has a credit card on it, all the merged orders for the invoice account will be consolidated into a single invoice and the entire amount will be charged. The preauthorization for the first order will be used to process the card and all preauthorizations for the remaining merged sales orders will be voided. If the first order for the invoice account does not have a credit card on it but the remaining merged orders do have a credit card, then the credit cards on those orders will not be used and all preauthorizations will be voided.

## Refunds

Credit card refunds are not supported in Dynamics AX 2009. The refunds must be processed manually. The refunds for Authorize.Net can be processed on the Authorize.Net web site. Refunds for Microsoft Dynamics Payment Services will be available in a future release on the Microsoft Dynamics Payment Services site. Refunds can also be processed as credits to a customer's account or by issuing a refund check.

## Voiding an authorization

Once you have preauthorized an amount, you may want to void that preauthorization. For example, a customer may want to cancel the order. In addition, customers may change their minds and decide to use another payment method.

You can void a preauthorization by changing the payment term. When you change the payment term, the dialogue box shown in Figure 20 will appear. Click on OK to void the preauthorization. You must always perform this step before deleting a sales order as well.

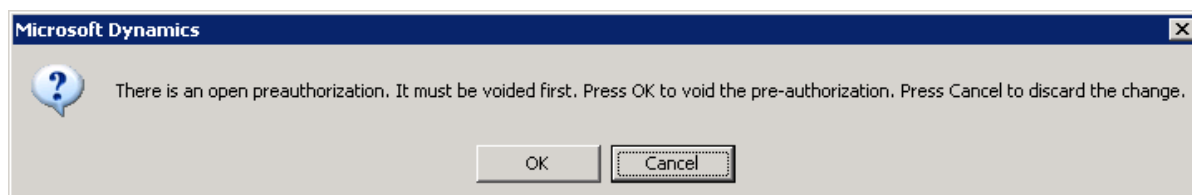


Figure 20: Voiding preauthorizations

## Carrier issues

Not all credit cards will be approved the first time that they are processed. Orders that have issues with a credit card can be displayed in a form called Credit card issues that can be found under the Accounts receivable > Inquiries. The form will contain only orders that have been declined at least once and were not approved in a later attempt to process them.

Sales order	Customer account	Invoice account	Order type	Status	Currency	Project	Blanket order	Quality order status
00034_036	4504	4504	Sales order	Open order	USD			

Figure 21: Credit card issues

## Intercompany processing

Credit cards can be used in intercompany orders. When intercompany orders are automatically invoiced, the credit card is authorized during the invoice process. If the credit card is declined, the entire intercompany invoice posting will be stopped as if there was a posting failure. The order will need to be invoiced again once the credit card issue is solved.

## Technical Information

The credit card processing feature is a framework for credit card processing. In this section, we provide more detail about the development approach and issues for the feature.

The credit card processors records are created when you open the credit card processor form for the first time. The settings for which processors is active and the payment journals are stored a table called CreditCardProcessors.

Each credit card processor has unique requirements for how you must connect to them and process the credit card transactions. Due to these requirements, the settings for each processor are stored in separate tables.

## Microsoft Dynamics Payment Services (MDPS)

MDPS communicates with Microsoft Dynamics AX using two DLLs that are installed during setup.

- MSIDCRL40.dll is provided as a part of the Windows Live SDK and is used to validate the Windows Live IDs and obtain a ticket that will allow communications with MDPS.

- Microsoft.Dynamics.AX.Fim.PaymentService.dll was developed to communicate with MDPS to process transactions

The URLs needed by Microsoft Dynamics AX to communicate with the MDPS web service and MDPS web pages for signup and account management are stored in a table called CreditCardMicrosoftSetup.

## Authorize.Net (ADN)

ADN communicates with Microsoft Dynamics AX using the HTTPS protocol. Responses received back from ADN are expected by Microsoft Dynamics AX to be returned in a comma separated values format (CSV). You can select the setting for CSV on the Authorize.Net account management site in the security settings section that is named Direct Response

The settings required to communicate with ADN are stored in a table called CreditCardADNSetup.

## Security

There are two tables for this feature that require additional security. The CreditCardProcessorsSecurity table stores the Windows Live ID password for MDPS and the transaction key for ADN. The CreditCardCustNumber table stored the credit card numbers that were entered through the credit card wizard. These tables also use the table permissions framework (TPF) to limit access.

Although the AOS and the Admin user are the only users that can access the Microsoft Dynamics AX database when it is installed, use of SQL Server Encryption capabilities will be necessary to further restrict access to the two tables. Specifics about the SQL Server solution will be provided in the Dynamics AX Security Hardening Guide.

To reduce the possibility of obtaining credit card numbers on the network, all Microsoft Dynamics AX code that processes the full credit card number is executed on the AOS.

## Error Messages

There are several types of error messages that can occur. If the error message is returned by the credit card processor, such as "Decline" or "Invalid login", then the error message will be displayed in a dialog box and included on the Credit card transaction history form. If there are network issues or more serious failures that are not returned by the credit card processor, Microsoft Dynamics AX will attempt to determine the most probable cause and display that error in a dialog box. Additional error information will be included on the Credit card transaction history form.

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