TechnipFMC

Electronic Preset Delivery System

Smith Meter® Proximity Card Reader

Installation / Operation Manual

MN06144 Issue/Rev. 0.5 (10/18)

Important

All information and technical specifications in this documentation have been carefully checked and compiled by the author. However, we cannot completely exclude the possibility of errors. TechnipFMC is always grateful to be informed of any errors. Contact us on the website.

Smith Meter® is a registered trademark of TechnipFMC.

Caution

The default or operating values used in this manual and in the program of the AccuLoad® are for factory testing only and should not be construed as default or operating values for your metering system. Each metering system is unique and each program parameter must be reviewed and programmed for that specific metering system application.

Caution

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with this Instruction Manual, may cause interference to radio communications. It has not been tested to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

Disclaimer

FMC Technologies Measurement Solutions, Inc. hereby disclaims any and all responsibility for damages, including but not limited to consequential damages, arising out of or related to the inputting of incorrect or improper program or default values entered in connection with the AccuLoad®.

Technical Support

Contact Information:
Field Service Response Center
24/7 Technical Support/Schedule a Technician: 1-844-798-3819
System Installation Supervision, Start-Up, and Commissioning Services Available

Customer Support

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Section I – Introduction

This manual is to be used for the installation of the Smith Meter® Proximity Card Reader. The manual will be divided into five sections: Introduction, Installation, Operation, Communications and Related Publications.

"Installation" describes step by step procedures for installing and wiring the Card Reader.

"Operation" explains how to program and use the Card Reader.

"Communication" details both user commands and the Card Reader's responses to these commands.

"Related Publications" lists the literature that is associated with the AccuLoad.

Receipt of Equipment

When the equipment is received the outside packing case should be checked immediately for any shipping damage. If the packing case has been damaged, the local carrier should be notified at once regarding his liability. Carefully remove the unit from its packing case and inspect for damaged or missing parts.

If damage has occurred during shipment or parts are missing, a written report should be submitted to the Inside Sales Department, FMC Technologies Measurement Solutions, Inc., 1602 Wagner Avenue, Erie, Pennsylvania 16510.

Before installation, the unit should be stored in its original packing case and protected from adverse weather conditions and abuse.

Section II – Installation

Card Reader System Description

The Smith Meter® Proximity Card Reader is an RF-based proximity reader interfaced to a microprocessor-based device capable of interpreting multiple card formats and transmitting card data to the AccuLoad or directly to an automation system-reader.

The Card Reader provides a high performance and reliable method of identifying drivers and users to either the AccuLoad or directly to an automation system. The Card Reader has the ability to communicate either directly to an automation system or through the AccuLoad. (For more information on communicating through the Accu-Load III, refer to Manual MN06130L; for AccuLoad IV, refer to MN06203.) The Card Reader is ideal as either a gate reader or an island reader.

Pre-Installation Considerations – Mechanical

In addition to the following, all previous warnings and cautions should be reviewed before installation.

1. A solid mounting base should be used to support the explosion-proof or non-explosion-proof Card Reader. Approximate weight: 5.78 pounds (2.59 kilograms) for the explosion proof Card Reader and 3.58 pounds (1.62 kilograms) for the non-explosion-proof Card Reader.

2. The location and the height of the Card Reader should be selected to permit easy access.

3. Access for servicing the Card Reader is through the front cover.

4. Conduit entry to the explosion-proof Card Reader is through the bottom and left-hand side of the housing. Conduit entry to the non-explosion proof Card Reader is through two entrances in the bottom of the housing.

5. In warm climates, the Card Reader should be shaded from direct sunlight. The maximum external temperature of the Card Reader housing must not exceed 140°F (60°C) to ensure that the internal temperature limit is not exceeded.

Pre-Installation Considerations – Electrical

Note: The following recommendations are based on our knowledge of the electrical codes. The local electrical codes should be reviewed to ensure that these recommendations follow the local code. Also, installation manuals of all the equipment being wired into the AccuLoad should be reviewed for transmission distances and wire recommendations.

Typical Wire Sizes

Equipment	Number & Gauge of Wire	Belden Number or Equivalent
EIA-232 Communications	3 / 24 Ga.	9533
EIA-485 Communications	4 / 24 Ga.	9842

Maximum Cable Length and Baud Rate (EIA-232)

Baud Rate	Feet	Meters
19,200	500	150
9,600	1,000	305
4,800	2,000	610
2,400	4,000	1,220

Maximum Cable Length and Baud Rate (EIA-485)

| Baud Rate	Feet	Meters
2,400 to 19,200	4,000	1,220

Electrical Installation

1. ATEX / IECEx – Approved Units

   a. Cable entry must be in accordance to IEC/EN 60079-1 section 13. For systems utilizing cable glands the gland and or thread adaptor must be Ex d IIB certified and IP66 rated. The cable end must be securely installed and depending on the cable type be properly protected from mechanical damage. All wiring and cable glands must be rated for 85°C or higher.

   b. Conduit Entry must be in accordance to IEC/EN 60079-1 section 13.

   c. For systems utilizing conduit, an Ex d IIB certified sealing device must be used immediately at the entrance of the enclosure. ¾" -14 NPT threaded entry, all cable entries, stopping boxes or plugs shall be certified according to the requirements of IEC/EN 60079-1.

   d. **Caution:** To prevent ignition of hazardous atmospheres, disconnect from supply circuit before opening, keep tightly closed when circuits are in operation.

   e. **Warning**: For use with FMC model PC-IS proximity card only. To reduce the risk of ignition of hazardous atmospheres, do not open enclosure unless the area is known to be non-hazardous, conduit entrances must have a sealing fitting connected within 18 inches of the enclosure.

   f. The optical radiation output of the apparatus with respect to explosion protection, according to Annex II clause 1.3.1 of the Directive 2014/34/EU is covered in DEMKO 03 ATEX 0252381.

   g. Ex d IIB T6 GB Tamb = -40°C to +60°C IP66 (Proximity Card Reader)

      ATEX Certificate 03ATEX 0252381.

      IECEx Certificate UL 14.0046.

   h. Ex ib IIB T6 Gb Tamb = -40°C to +70°C (Proximity Card)

      ATEX Certificate Part of 03ATEX 0252381.

      IECEx Certificate UL 14.0046

CE 0539 ⟨Ex⟩ II 2G

2. Supply by isolating source and 4.2A maximum over current protection fuse, make sure all connections on the terminal blocks are tight.

3. For AccuLoad III, all shields must be connected to terminals 3, 13, 14, or 15 on terminal block TB4 on the EAAI board, or terminal 3 and 4 on terminal block TB6 on the KDC board, or terminals 9 and 10 on TB14 on the BSE board. For AccuLoad IV, all shields must be connected to terminals 3, 13, 14, or 15 on terminal block TB4 on the A4M board, or terminal 3 and 4 on terminal block TB6 on the A4M board, or terminals 9 and 10 on TB14 on the A4B board.

4. All exposed shields must be properly insulated to prevent short circuits to other terminals or to the chassis. The shield at the device Card Reader must be cut back to the insulation and taped off. All shields should be continuous. If splices are required, they must be soldered and properly insulated.

5. If other communicating devices are used with the Card Reader, refer to the manual for that unit for shielding information. Shields for other communicating equipment should not be terminated in the Card Reader.

   Note: Shields must not be terminated at the ground lug.

6. Sufficient slack should be provided for the wiring in the Card Reader to permit easy removal of the board. With sufficient slack, the terminal block can be removed and laid back out of the way so that the board can be replaced without removing individual wires.

7. There is a ground lug provided in the unit. The wire from the lug should be connected to the proper grounding point.

   Note: ATEX-approved Card Readers require that the customer install ferrules (Aderendhulsen) per DIN 46 228 on the grounding wires prior to installation into the grounding lugs.

8. Typical electrical installation diagrams are provided in the following section. Before wiring the ancillary equipment, refer to its installation manual.
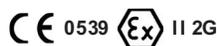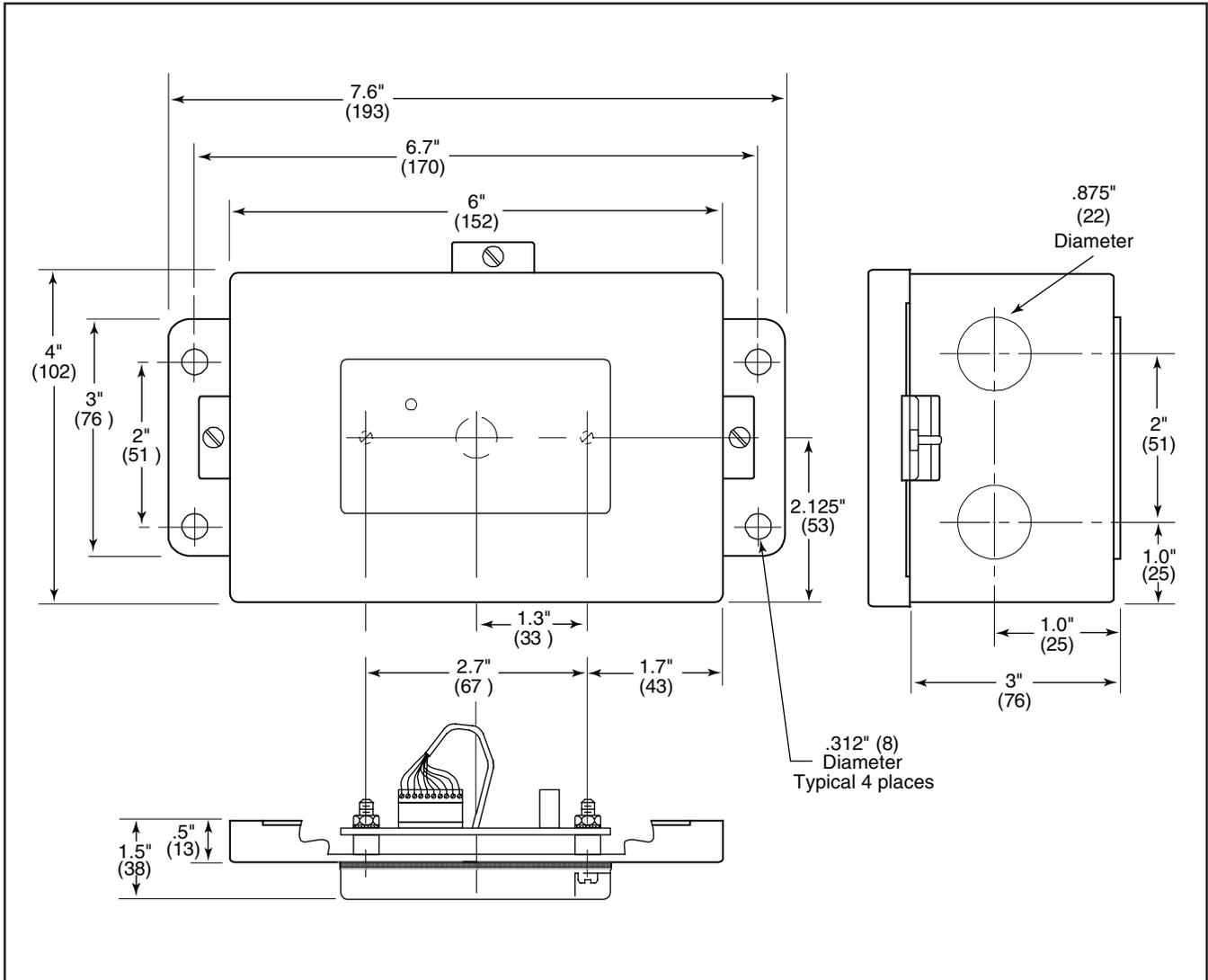
Figure 1. General Purpose Card Reader Dimensions
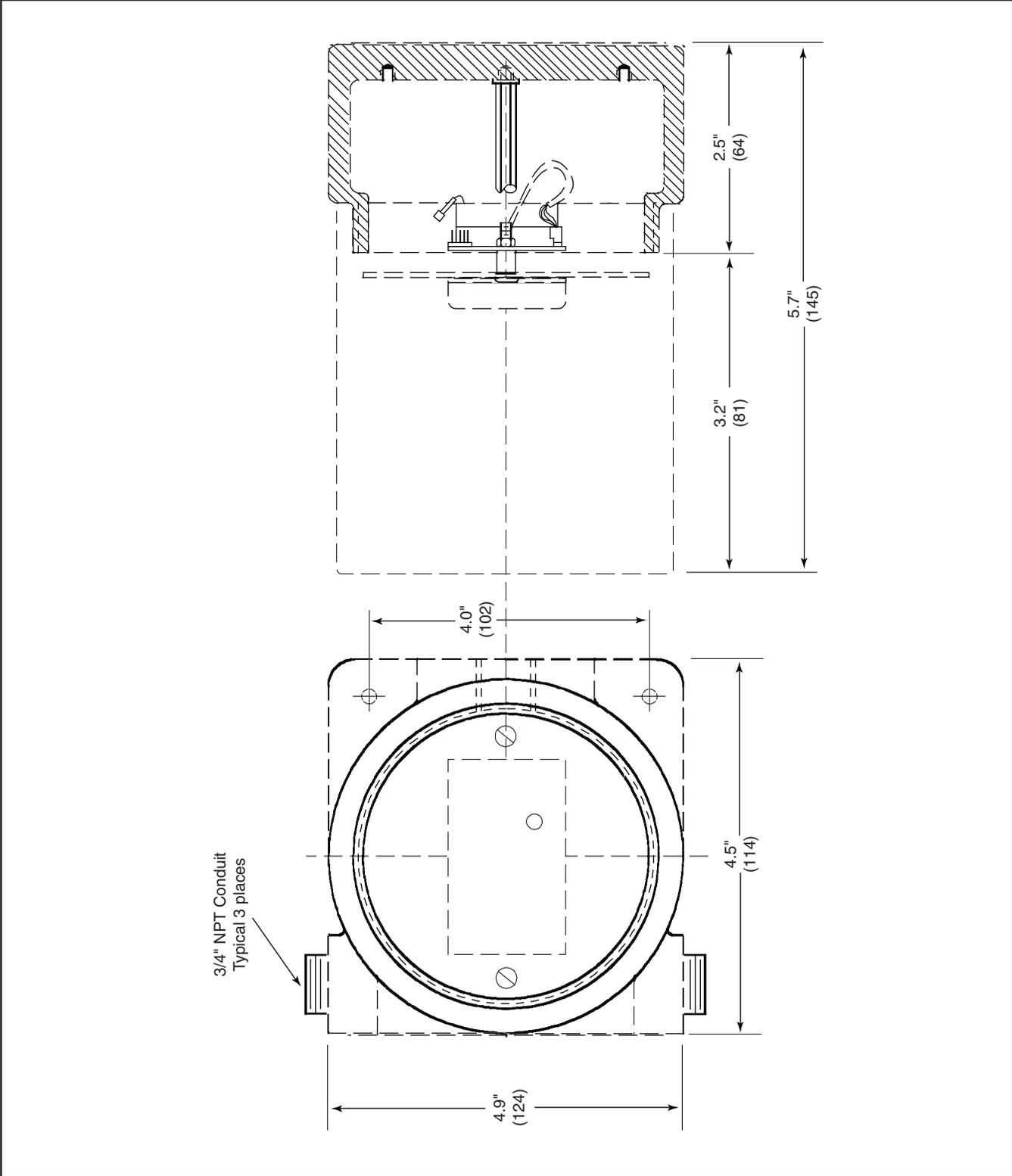
Figure 2. Explosion-Proof Card Reader
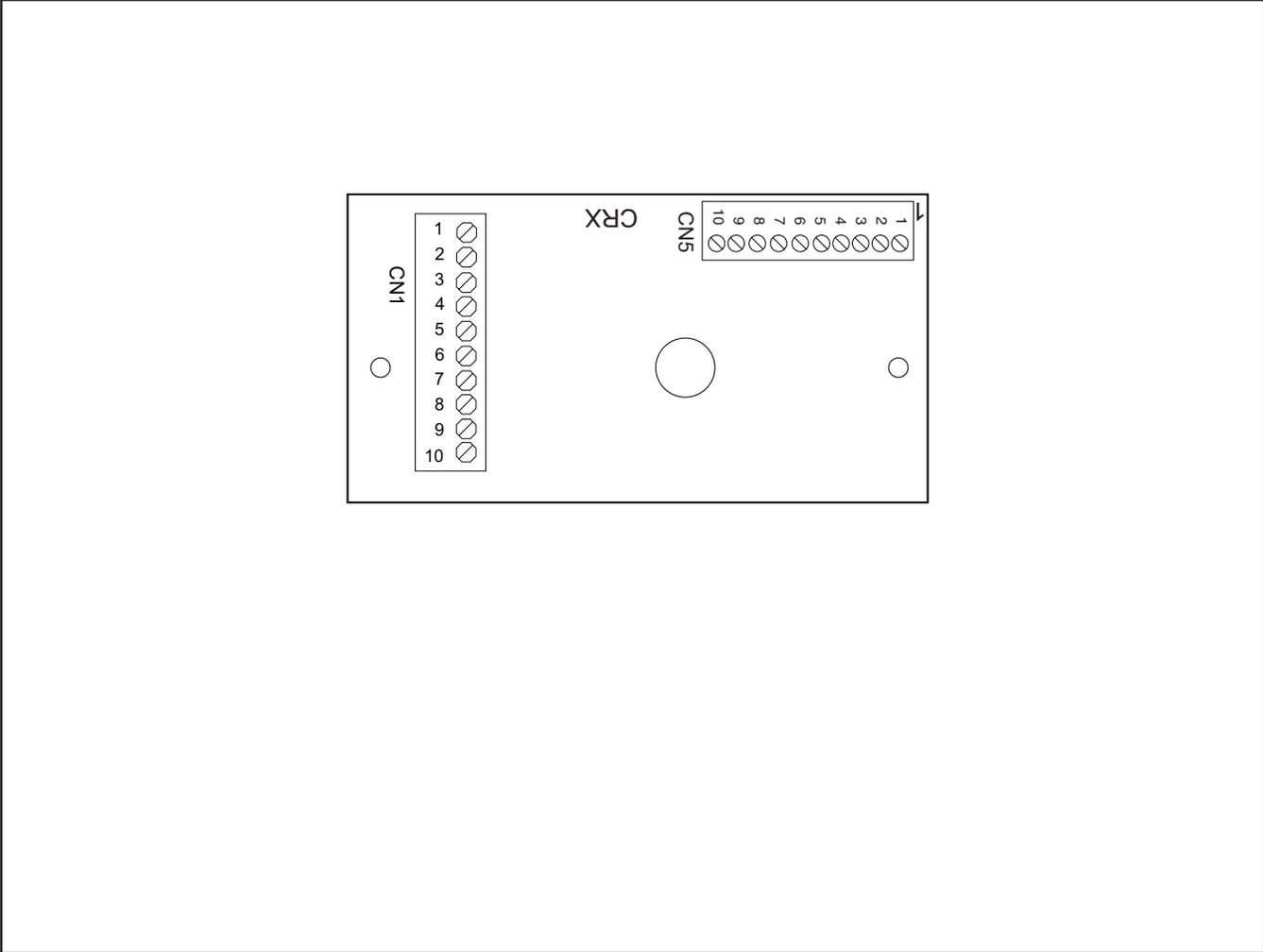
Figure 3. Card Reader Wiring
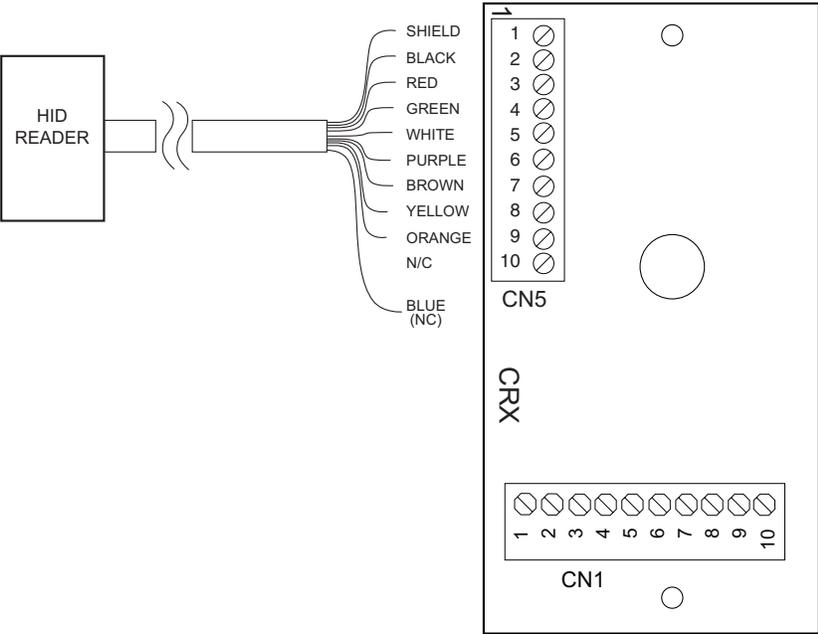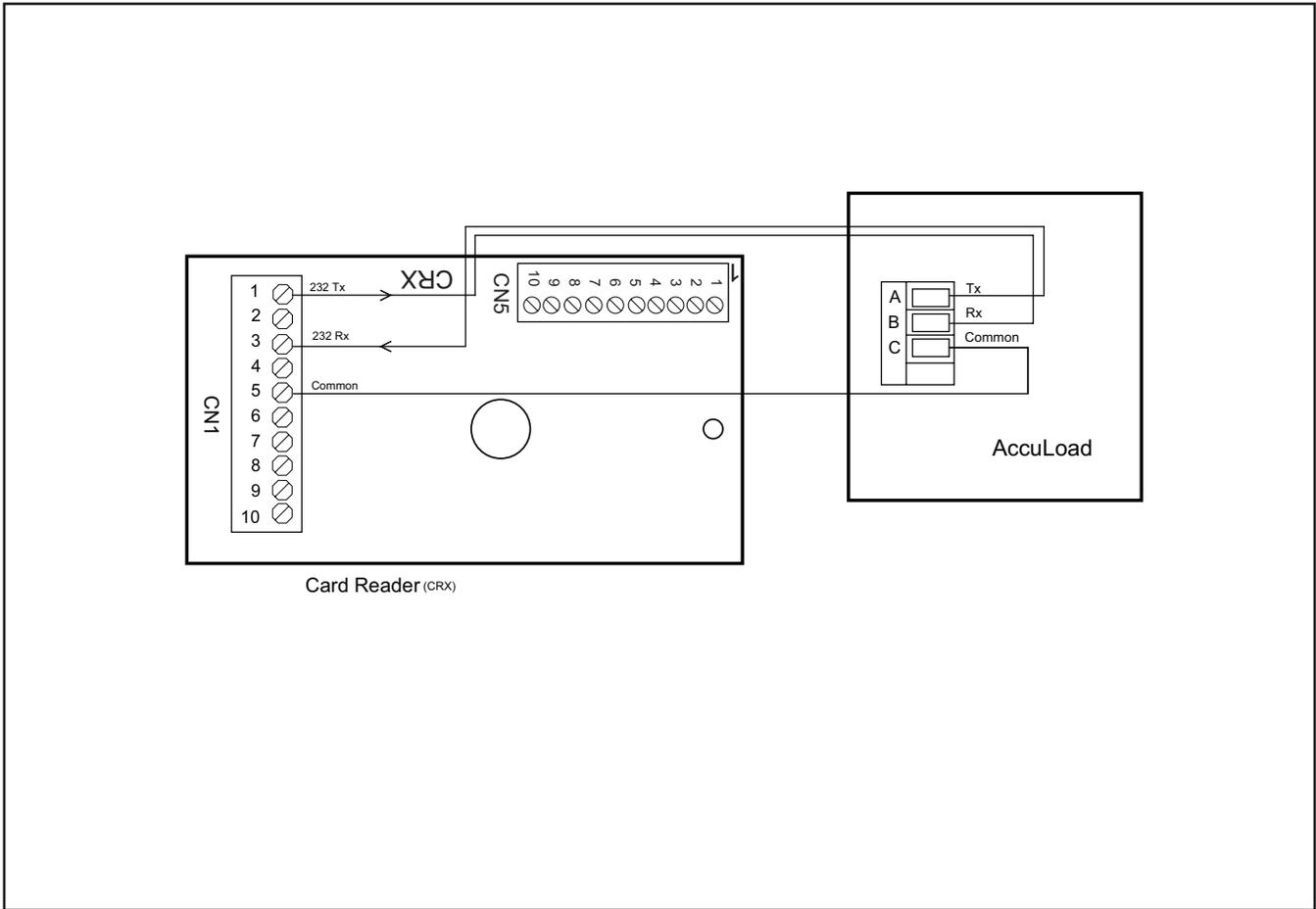
Figure 4. Card Reader 232 Communications with AccuLoad

Caution: For clarity, shield not shown. Select one of the three available ports.

AccuLoad III Comm Port	Tx (A)	Rx (B)	Common (C)	Board	Terminal Block
1	1	2	5	KDC	TB1
2	1	2	3	KDC	TB2
4	1	2	3	EAAI	TB4

AccuLoad IV Comm Port	Tx (A)	Rx (B)	Common (C)	Board	Terminal Block
1	1	2	5	A4M	TBK1
2	1	2	3	A4M	TBK2
4	1	2	3	A4M	TBE4
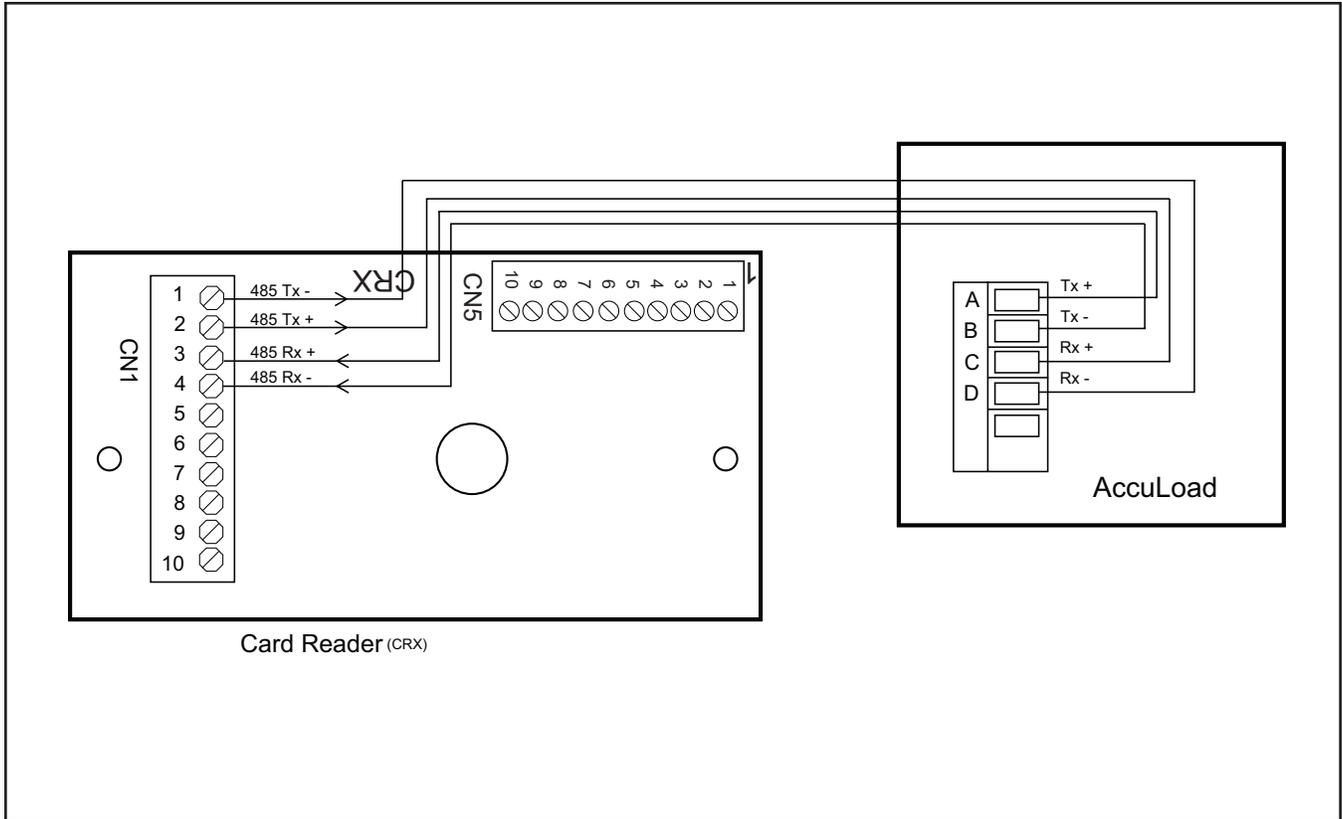
Figure 5. Card Reader 485 Communications with AccuLoad

Caution: For clarity, shield not shown. Select one of the three available ports.

AccuLoad III Comm Port	Tx+ (A)	Tx- (B)	Rx+ (C)	Rx- (D)	Board	Terminal Block
1	6	7	8	9	KDC	TB1
2	4	5	6	7	KDC	TB2
3	1	2	3	4	KDC	TB3

AccuLoad IV Comm Port	Tx+ (A)	Tx- (B)	Rx+ (C)	Rx- (D)	Board	Terminal Block
1	6	7	8	9	A4M	TBK1
2	4	5	6	7	A4M	TBK2
3	1	2	3	4	A4M	TBK3
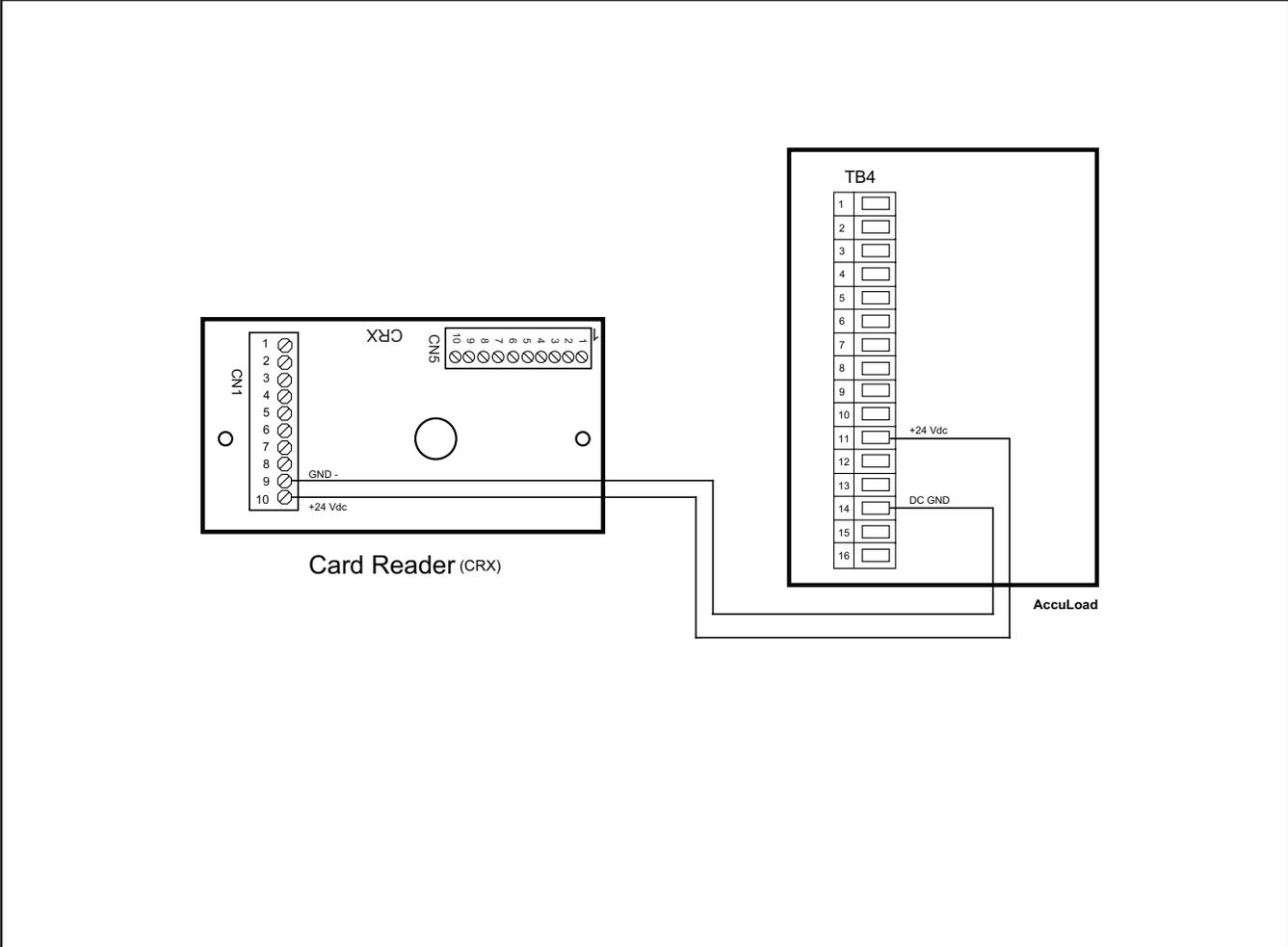
Figure 6. Card Reader 24 Vdc Power from AccuLoad
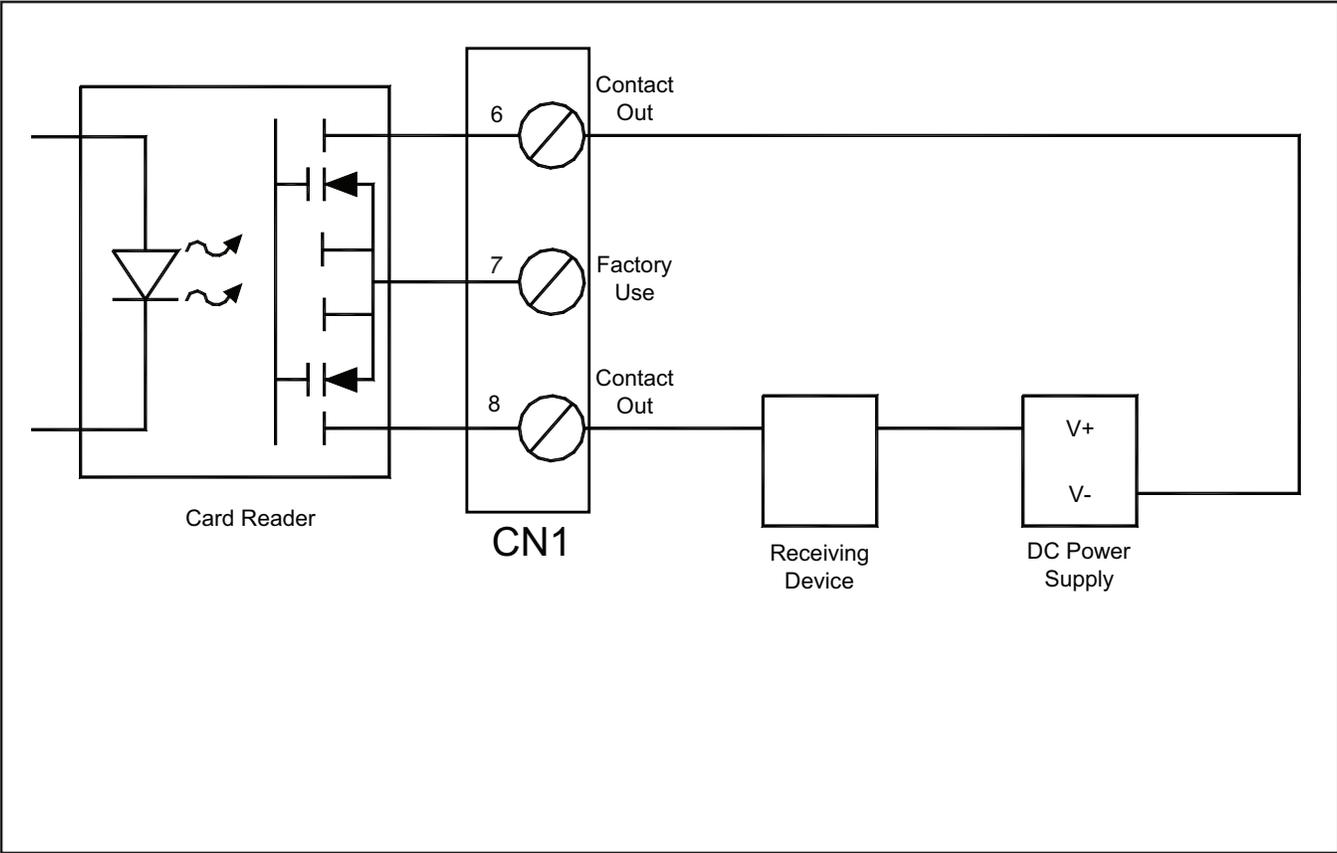
Figure 7. Contact Output
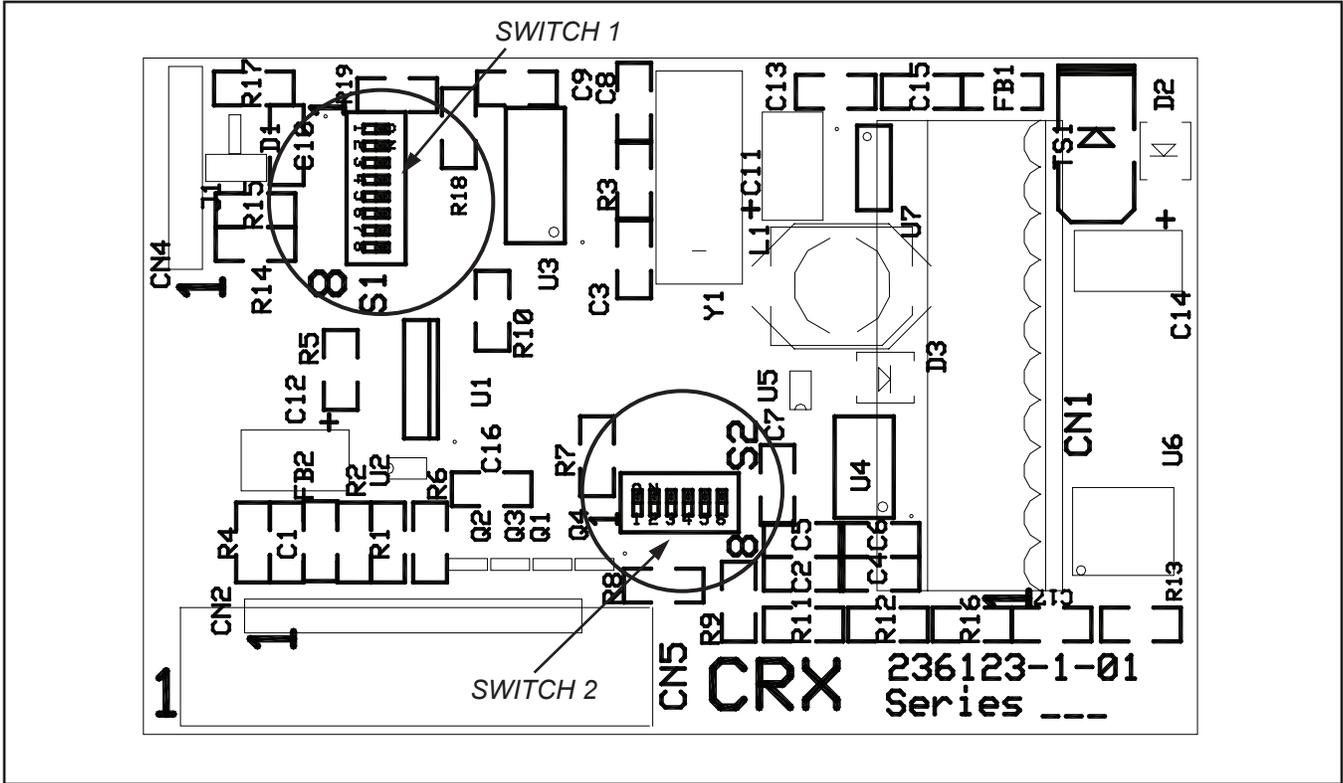
Figure 8. Configuration Switch Location

Card Reader Configuration Switches					
Switch S1			**Switch S1**		
S1-8	S1-7	Baud Rate	S1-6	Must be Off	Factory Use Only
On	On	2400	S1-3		Factory Use Only
On	Off	4800	S1-2		Factory Use Only
Off	On	9600	S1-1	Must be On	Factory Use Only
Off	Off	19,200	**Switch S2**		
S1-5	S1-4	Address	S2-5,6	On=485 Terminations	Off=No Terminations
On	On	0	S2-4	Factory Use Only	Must be On
On	Off	1	S2-3	On=Full Duplex	Off=Half Duplex
Off	On	2	S2-2	On=232	Off=485
Off	Off	3	S2-1		Factory Use Only
Card Reader Configuration Switches – Factory Defaults					
Switch S1			**Switch S2**		
On	S-1-1, S1-4, S1-5		On	S2-2, S2-3, S2-4	
Off	S1-2, S1-3, S1-6, S1-7, S1-8		Off	S2-1, S2-5, S2-6	

Card Reader Interface Operation

The card reader is linked to the AccuLoad via communications. The AccuLoad communicates with the card reader and can relay both the card status and the card data to an automation system. The card data is archived with the transaction and is available for printing on the transaction report.

The Smith Meter Card Reader is a proximity card reader. The reader can be mounted directly to the front of a NEMA-IV AccuLoad or the MMI of the AccuLoad Split Architecture. The interface for the split architecture is addressed following the standard AccuLoad application.

AccuLoad is also capable of storing a database of valid cards. These can be entered via AccuMate or downloaded from an automation system. A diagnostic is also available to allow the cards to be swiped at the card reader and stored in the AccuLoad's database. AccuLoad can then use this database to authorize a driver, if so programmed. This validation can occur all the time or only when the automation system is off-line.

Step 1: Set up a communications port for the card reader

Select a communications port for the card reader interface and set the corresponding system parameter (707, 712, 717, or 722) to Smith Card Reader. Next, set up the baud rate and data format for the communications port to match the settings of the card reader. The control for the port (710, 715, 720, or 725) should be set to 0, N/A.

Step 2: Set up timeout for valid card data

System parameter 772 allows entry of the timeout period. The timeout represents the period of time that the card data will remain valid with no transaction activity at the AccuLoad. Since the card reader is a proximity reader, there is no card present inherent in the reader. Therefore, the card data read will be considered viable for the length of this timeout. If a transaction is begun on any load arm before the timeout expires, then the card data will remain viable until there is no transaction in progress on any load arm of the AccuLoad. Note that during the timeout period, a new card will be accepted by the AccuLoad and will replace the previous card read. Once a transaction is in progress, new card data will be ignored.

Step 3: Determine the use of the card data in the AccuLoad

Set system parameter 771 according to how the card data is to be used in conjunction with the AccuLoad. Several options are available. Note that card data is archived with the transaction regardless of the option selected.

- **0 – ID Stamp only.** The card data is saved with the transaction if a card was presented; however, the driver is not prompted to card in nor is a card-in required.

- **1 – ID Stamp + Card In Required.** The driver is presented with a "Please Card In" prompt, rather than "Press SET Key." Carding in is required before loading can proceed, but the card data is not compared with a database in the AccuLoad.

- **2 – Validate in Standalone / Standby Mode Only.** This option allows the AccuLoad to validate cards only when the automation system is off-line. When the automation system is controlling the loading process, the AccuLoad will accept card data and archive it with the transaction, but will not require card-in nor attempt to validate the card data. Thus, when under automation control, the AccuLoad will respond as though the "ID Stamp Only" option were selected. When the AccuLoad goes into Standby mode (as a result of the automation system going off-line and the timeout expiring on the AccuLoad), carding in will be required and loading will be prevented if the card data does not match one of the entries in the card database in the AccuLoad. If a card is recognized by the card reader but cannot be validated by the AccuLoad (not in the database), the AccuLoad will display "Invalid Card" and presetting will not be permitted. This selection is designed for installations that impose the card validation function on the host system, but still maintain the security of card validation if the host goes offline. If no communications port is configured for either remote control or poll and authorize, the AccuLoad is considered to be in Stand Alone mode. With this option selected, if the AccuLoad is in Stand Alone mode, validation is required as described above.

- **3 – Always Validate.** This option requires validation regardless of the presence or absence of an automation system. The driver will always be prompted to card in. The lack of a valid card will cause the AccuLoad to deny access to presetting even if the automation system has issued its authorization.

Step 4: Set up a card database

Note that this step is only required if card validation was selected in the previous step.

There are three methods available for establishing a card database in the AccuLoad. First, card data already existing in an automation system may be transmitted to the AccuLoad via communications. Second, card data can be entered via the AccuMate. When a database has been composed, this may be downloaded to the AccuLoad. The third method is to use the card reader to retrieve the data from each card and have the AccuLoad store it in the card database. This method is accomplished via a diagnostic.

- **Automation Method:** If a card database already exists in the automation system, this is probably the easiest approach. The AccuLoad supports new communications commands allowing a card database to be established and manipulated at the AccuLoad. The "DI" command allows a driver record to be inserted in the database. The "DD" command allows a record to be deleted. The "DU" command instructs the AccuLoad to update the database in nonvolatile memory. A "DQ" command is available for the automation system to read the database. Please see the communications manual for further details.

- **AccuMate Method:** AccuMate offers a means of entering the card data from the master list provided by the card manufacturer. From AccuMate, choose "File | New", then select "Driver Database." Double-click on the first entry and an entry window will appear. Enter the card number and, optionally, the name of the driver to which the card has been assigned. Double-click on the next entry and continue with the data entry. When all of the data has been entered, select "Edit | Dump All" with the AccuMate online with the AccuLoad.

- **Card Reader Method:** For this method, the card reader itself is used as the means for entering the card data into the database. At the AccuLoad, enter the program mode. Select diagnostics. From the diagnostics menu, choose "Card Reader Database Update." As cards are swiped, the data from each card is entered into the database. The only disadvantage of this method is that you have to have all of the cards, which may have already been distributed.

The AccuLoad also offers a method for inserting the data from a single card into the database. When a driver cards in and receives the "Invalid Card" message, press the SET key. The operator will be prompted for a passcode. If a valid passcode is entered, the new card data may be stored in the database. The driver can then proceed with his loading.

The card database in the AccuLoad supports up to 1,000 cards.

Split Architecture Application

The Card Reader Interface is also designed for the AccuLoad Split Architecture. In this application, the card reader is located at the MMI (man-machine interface) and communications is established between the card reader and the MMI. After the MMI receives the data from the card reader, the MMI transmits this card data to the flow control module.

In the case of a Dual MMI Split Architecture AccuLoad, two card readers would be used. One card reader would be connected to each MMI. The card data would then be transmitted to the flow control module for the load arms assigned to that MMI, both those assigned permanently and those currently swung to that position.

An automation system may retrieve card data from a Split Architecture AccuLoad from either the MMI or from any load arm. If requested from the load arm, the card data will remain available until the last transaction is ended on the board set or the timeout expires. If requested from the MMI, the data will not time out but will remain available until the next card is read.

Step 1: Set up a communications port for the card reader (MMI)

Select a communications port for the card reader interface on the MMI then enter program mode on the MMI by pressing the "F2" key. Set the corresponding system parameter (720, 725, or 730) to Smith Meter Card Reader. Next, set up the baud rate and data format for the communications port to match the settings of the card reader.

Step 2: Enable or disable a card database that has been downloaded to the MMI

MMI System parameter 771 is used to enable or disable a card database that is downloaded to the MMI that is to be used for driver validation. A card database would be disabled when a card database in the FCM boards is used.

Refer to step 4 to set up the function of the card database in the AccuLoad FCM board sets via the AccuLoad System parameter 771.

Step 3: Set up timeout for valid card data

Flow Control Module system parameter 772 allows entry of the timeout period. To configure this parameter, enter program mode from the Main Menu. To do this, press "Clear" from the ready screen for any load arm. The Main Menu will appear. Enter the desired timeout period. Repeat this procedure for every board set in the AccuLoad Flow Control Module, by bringing a load arm serviced by that board set into focus and following the instructions above.

The timeout represents the period of time that the card data will remain valid with no transaction activity at the board set. Since the card reader is a proximity reader, there is no card present inherent in the reader. Therefore, the card data read will be considered viable for the length of this timeout. If a transaction is begun on any load arm before the timeout expires, then the card data will remain viable until there is no transaction in progress on any load arm of the board set. Note that during the timeout period, a new card will be accepted by the AccuLoad and will replace the previous card read. Once a transaction is in progress, new card data will be ignored.

Step 4: Determine the use of the card data in the AccuLoad

Flow Control Module system parameter 771 allows the operator to select how the card data is to be used in conjunction with the AccuLoad. Several options are available. Note that card data is archived with the transaction regardless of the option selected.

- **0 – ID Stamp only.** The card data is saved with the transaction if a card was presented; however, the driver is not prompted to card in nor is a card-in required.

- **1 – ID Stamp + Card In Required.** The driver is presented with a "Please Card In" prompt, rather than "Press SET Key." Carding in is required before loading can proceed, but the card data is not compared with a database in the AccuLoad.

- **2 – Validate in Standalone / Standby Mode Only.** This option allows the AccuLoad to validate cards when only when the automation system is off-line. When the automation system is controlling the loading process, the AccuLoad will accept card data and archive it with the transaction, but will not require card-in or attempt to validate the card data. Thus, when under automation control, the AccuLoad will respond as though the "ID Stamp Only" option were selected. When the AccuLoad goes into

Standby mode (as a result of the automation system going off-line and the timeout expiring on the AccuLoad), carding in will be required and loading will be prevented if the card data does not match one of the entries in the card database in the AccuLoad. If a card is recognized by the card reader but cannot be validated by the AccuLoad (not in the database), the AccuLoad will display "Invalid Card" and presetting will not be permitted. This selection is designed for installations that impose the card validation function on the host system, but still maintain the security of card validation if the host goes offline. If no communications port is configured for either remote control or poll and authorize, the AccuLoad is considered to be in Stand Alone mode. With this option selected, if the AccuLoad is in Stand Alone mode, validation is required as described above.

- **3 – Always Validate.** This option requires validation regardless of the presence or absence of an automation system. The driver will always be prompted to card in. The lack of a valid card will cause the AccuLoad to deny access to presetting even if the automation system has issued its authorization.

Step 5: Set up a card database

Note that this step is only required if card validation was selected in the previous step.

The AccuLoad III Split Architecture supports a card database and validation in the MMI for Firmware revisions 10.02 and higher.

Alternatively, a card database can be downloaded to the board sets in the FCM but must reside in each board set in the FCM.

Maintenance updates to the database must be performed where ever it resides, in the MMI or each board set.

The methods for entering/downloading a card database (Automation, AccuMate, and Card Reader) are described above with the standard AccuLoad. If the Card Reader method is selected, once the diagnostic has been run and all of the cards have been entered, the diagnostic must be repeated for each of the board sets.

Arm Authorization with AccuLoad

The AccuLoad provides an interface to one Smith Card Reader. When a valid card is presented to the card reader, the AccuLoad will allow transactions on all arms (i.e. a valid card authorizes all arms in AccuLoad) or the

option to allow the card validation to apply to only one transaction. This will allow for drivers on both sides of a bay to card-in and deliver transactions at the same time. Use the following parameter to select if it is desired for a valid card to apply to all arms or only for the next transaction that is started:

System – Communications Directory

```
774    Card Authorization

- >   All Arms
       Single Trans
```
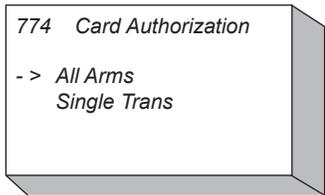
Program Code 774 – Card Authorization

Factory default setting will be "All Arms" (valid card authorizes all arms).

When using single transaction option, once a driver cards-in, one load arm can be chosen to start loading. If additional transactions using other arms are desired, the driver must card-in for each transaction.

When a driver cards-in, the AccuLoad will not know which arm the validation is to be applied to. It will be up to the driver to change the "focus" to the desired arm and start a transaction on the desired arm before another driver cards-in and/or attempts to start a transaction. If the driver accidentally chooses the wrong arm and returns from the preset prompt to the ready screen, the driver has until the "card data valid timeout" (System 772) expires to choose a different arm.

Note: It will be important that the driver doesn't card in until he is ready to start the transaction. Otherwise a driver on the other bay could make use of his card validation.

If the AccuLoad is configured for bays using the "Bay Assign" parameter (Arm 109), the driver will only need to card-in once for the bay transaction. Once a driver cards-in, the driver has until the "card data valid timeout" (System 772) expires to start a transaction on the bay. A bay transaction may include several arms on the bay. Once a transaction has been started on the bay, batches may be started using additional arms without having to card-in. Once the bay transaction is ended, the card authorization for the bay is terminated.

Note: If arms are assigned to bays using the "Bay Assign" parameter, this will configure the AccuLoad to create bay transactions and not arm transactions.

With dual MMIs, a separate card reader can be connected to each MMI. If the card database is downloaded to each MMI, the MMIs provide for separate card validation for each bay. When a driver cards-in at one MMI, the bay is authorized and the driver may start transactions on any arm of the bay. Using the single transaction option, it is possible to connect a single card reader to the FCM (no card readers should be attached to the MMIs), and card authorization will be performed per transaction.

Only one card database may be downloaded to the AccuLoad. This card database will be used to validate all cards regardless of bay.

Example #1

The AccuLoad is shared between two bays and is programmed to authorize a single arm when a valid card is read via card reader (System 774). The AccuLoad is programmed for "independent arms" and not for bays (Arm 109), therefore drivers must card-in for each transaction.

A driver pulls up to Bay A. The driver swings the desired arm to the bay that driver is using. The driver then cards-in. The driver changes the "focus" on the AccuLoad to the arm chosen and starts a transaction.

Meanwhile a driver pulls up to Bay B. This driver swings an available arm to the other bay. The driver then cards-in. The driver changes "focus" to the arm chosen and starts the transaction for the arm on that bay.

If either driver needs to use any other arm, they will need to card-in for each additional arm they want to use.

Example #2

The AccuLoad is shared between two bays and is programmed to authorize a single transaction when a valid card is read via card reader (System 774). Each arm is assigned to a bay in the AccuLoad using the "Bay Assign" parameter (Arm 109); therefore a driver must card-in only once for a bay transaction.

A driver pulls up to Bay A. A desired arm is swung to that bay. The driver then cards-in. The driver changes the "focus" on the AccuLoad to the arm chosen and starts a transaction on that bay.

Meanwhile a driver pulls up to Bay B. This driver swings an available arm to that bay. The driver then cards-in. The driver changes "focus" to the arm chosen and starts a transaction on that bay.

If either driver needs to use any other arm, they do not need to card-in again. Once the bay transaction is ended, the card authorization is no longer valid. If additional transactions are needed the driver would be required to card-in again.

Stand-Alone (No AccuLoad)

The Smith Meter Proximity Card Reader, when used in stand-alone mode, will broadcast card data in the format of the response to the "CD" command after a valid reading of the card (CD_S1_HHHH…H; see page 16 for details). The card reader stores the last valid card reading and that data will be returned when a CD command is sent to the card reader.

Section IV – Communications

Request to Card Reader

STX	A1A2	CD	ETX	LRC

OR

STX	A1A2	CD XX	ETX	LRC

Where

STX	= Start of Text
A1A2	= Card Reader Address
CD	= Command
CD XX	= Command with Options Bytes
ETX	= End of Text
LRC	= Longitudinal Redundancy Check

Response from Card Reader (26-Bit Card)

STX	A1A2	CD^	S1^	002	NN	XXXX	ETX	LRC

Where

STX	= Start of Text
A1A2	= Card Reader Address
CD	= Command
S1	= Status indication (0 or 1)
002	= Fixed Data for 26-Bit Card
NN	= Facility Code (0 – 255)
XXXX	= Card ID (0 – 65535)
ETX	= End of Text
LRC	= Longitudinal Redundancy Check
^	= Space

Response from Card Reader (37-Bit Card)

STX	A1A2	CD^	S1^	NNNNNNNNN	ETX	LRC

Where

STX	= Start of Text
A1A2	= Card Reader Address
CD	= Command
S1	= Status indication (0 or 1)
NNNNNNNNN	= Nine characters of card data, 0-9, A-F
ETX	= End of Text
LRC	= Longitudinal Redundancy Check
^	= Space

Section IV – Communications

Command Code CD – Card Reader Data

This command returns card reader data to the host.

Command:

> **"CD"**
> **"CD_C1C2"**
>
>
> *Where:*
>
> C1C2 (optional) is a two-character bitmap

Responses:

> **Good Response:**
>
> **"CD_S1_HHHHHHHHH"**　　*For CD (and CD_C1C2)*
> *Where:*
> *S1 is a one-character status indication – 0 = Data good*
> *S1 = 1 – Timed out (after 3 seconds from the time the card was swiped)*
>
> *HHHHHHHHH is the data encoded on the card*
> *Both 26-bit and 37-bit card data formats are supported*
>
> *For the 26-bit data format, the nine characters of card data are returned as follows:*
>
> *002NNXXXX*
>
> *Where:*
> *002 is fixed and is added to the data read from the card*
> *NN is the facility code in hexadecimal (decimal range is 0 – 255)*
> *XXXX is the card ID in hexadecimal (decimal range is 0 – 65535)*
>
> *For the 37-bit data format, the nine characters of card data can consist of any digits 0-9, A-F*

Remarks:　*None.*
Constraints:　*None.*
Special Case:　*None.*

CD Command, Optional Character C1

Character		Hex Value			
Char	Hex	0x08 Overide I/O Control	0x04 Reserved for Future Use	0x02 Reserved for Future Use	0x01 Reserved for Future Use
0	30				
1	31				X
2	32			X	
3	33			X	X
4	34		X		
5	35		X		X
6	36		X	X	
7	37		X	X	X
8	38	X			
9	39	X			X
:	3A	X		X	
;	3B	X		X	X
<	3C	X	X		
=	3D	X	X		X
>	3E	X	X	X	
?	3F	X	X	X	X

Response to Command Code CD – Character C1

Note: Override bit must be set to control I/O on card reader. Override bit cleared returns control of these I/O to the card reader.

CD Command, Optional Character C2

Character		Hex Value			
Char	Hex	0x08 Contact Closed	0x04 Beep	0x02 Red LED On	0x01 Green LED On
0	30				
1	31				X
2	32			X	
3	33			X	X
4	34		X		
5	35		X		X
6	36		X	X	
7	37		X	X	X
8	38	X			
9	39	X			X
:	3A	X		X	
;	3B	X		X	X
<	3C	X	X		
=	3D	X	X		X
>	3E	X	X	X	
?	3F	X	X	X	X

Response to Command Code CD – Character C2

Note: Red and Green LED both On = Amber LED on Reader.

Response to CD Command, Character S1

Character		Hex Value			
Char	Hex	0x08 Reserved for Future Use	0x04 Reserved for Future Use	0x02 Reserved for Future Use	0x01 Card Read Error or Card Timeout
0	30				
1	31				X
2	32			X	
3	33			X	X
4	34		X		
5	35		X		X
6	36		X	X	
7	37		X	X	X
8	38	X			
9	39	X			X
:	3A	X		X	
;	3B	X		X	X
<	3C	X	X		
=	3D	X	X		X
>	3E	X	X	X	
?	3F	X	X	X	X

Response to Command Code CD – Character S1

Section V – Related Publications

The following literature can be obtained from Measurement Solutions Literature Fulfillment at measurement.fulfillment@fmcti.com or online at www.fmctechnologies.com/measurementsolutions.

When requesting literature from Literature Fulfillment, please reference the appropriate bulletin number and title.

AccuMate for AccuLoad III
Specification .... Bulletin SS06032
Installation/Operation.. Bulletin MN06136

AccuLoad III-X
Specification .... Bulletin SS06036
Installation/Operation.. Bulletin MN06135
Operator Reference.. Bulletin MN06129
Communications... Bulletin MN06130L
Modbus Communications .... Bulletin MN06131L

AccuLoad II to III Upgrade
Specifications .... Bulletin SS06043
Installation .... Bulletin MN06145
Hardware Worksheet.. Bulletin AB06051

AccuLoad IV
Specifications .... Bulletin SS06200
Installation/Maintenance.. Bulletin MN06201
Operator Reference.. Bulletin MN06200
Upgrade Manual for AccuLoad III-S and Q to AccuLoad IV-ST and QT....................... Bulletin MN06203
Smith Communications for AccuLoad IV .... Bulletin MN06204L
Hardware Worksheet QT.. Bulletin AB06213
Hardware Worksheet ST .... Bulletin AB06214

Proximity Card Reader
Specifications .... Bulletin SS06044
Installation/Operation.. Bulletin MN06144

Technical Support

Contact Information:
Field Service Response Center
24/7 Technical Support/Schedule
a Technician: 1-844-798-3819
System Installation Supervision,
Start-Up, Training, and
Commissioning Services Available

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Page 7: Electrical Installation - Item 1 completely revised.

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