ProHelp Millennium™

Production Monitoring System

PLC Subsystems for 10X and 5XS Based MIU's

ProHelp 1000 Release 1.4x
ProHelp Millennium Release 2.xx

Installation, Application,
Specifications, and Wiring Diagrams

MANUAL # 710-0078
REV C

7/28/98

ATTENTION

This manual assumes the reader has a level of understanding of ProHelp, ProHelp 1000, and ProHelp Millennium especially with the current System Manager Module. In addition, while function keys are used to invoke various menu items, use of a mouse is also integrated, and typically the statement “Press [Fx]” can be interpreted as “click on”. Please resolve any questions immediately with the MATTEC Customer Service Department.

IMPORTANT MATTEC PHONE NUMBERS

MATTEC Customer Service Department.....(513) 683-1075

NOTE: Not all ProHelp System features are described herein. Your installation may not include all these functions due to the software options you purchased, or the computer hardware purchased, or the type of machine interface units purchased.

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1. MIU/PLC Interface Description

The Machine Interface Unit (MIU) to Programmable Logic Control (PLC) Interface allows for the collection of machine parameter data from the database contained within the PLC. This type of interface is an optional feature of the ProHelp Monitoring system.

The PLC Interface unit allows machine parameter data to be optionally supplied by the PLC. Data collected from the PLC will be assigned to an appropriate machine parameter field. Of the thirteen (13) machine parameter fields available in ProHelp, eleven (11) of these may be assigned to display data from the PLC data base and are identified as follows:

Machine Parameter Default Name	Decimal Places
Pulse 2	1 (2 in high resolution monitoring)
Pulse 3	1 (2 in high resolution monitoring)
Pulse 4	1 (2 in high resolution monitoring)
Analog 1	up to 4
Analog 2	up to 4
Analog 3	up to 4
Analog 4	up to 4
Analog 5	up to 4
Analog 6	up to 4
Analog 7	up to 4
Analog 8	up to 4

NOTE: "*Analog 7*" and "*Analog 8*" will automatically be set for the same number of decimal places as "*Analog 6*".

NOTE: Machine parameter names may be changed to suit the user; refer to the *ProHelp Operator's Manuals* for more information.

The "*CYC TIME*" and "*Pulse 1*" machine parameters are not available for assignment from the PLC, and must be provided to the MIU. The cycle time signal is used to initiate data requests from the PLC and to maintain minimal monitoring in the event of a PLC communication failure. Once a PLC data item has been assigned to a machine parameter field, normal limit checking will be applied. Any machine parameter collected from the PLC will be included in the Process Parameter report and is available to ProHelp/SPC monitoring functions. The range of values for machine parameter data is from -32767 to 32767 (regardless of the origin of the data).

Two error conditions specific to MIU/PLC data collection exist and are displayed on the real time screen. The first of these two conditions, MIU/PLC communications failure, exists when serial communications between the MIU and the PLC have ceased and is indicated on the real time display by a purple box just to the left of the machine parameters field. The second condition exists when the time it takes the PLC to provide the MIU with a requested set of data exceeds the machine cycle time. This error condition is indicated on the real time display by a gold box just to the left of the machine parameters field. This error indicates that for any given cycle there was not a complete set of machine parameter data collected. ProHelp/SPC automatic and manual data collection from the MIU is disabled when either of the above conditions exist. Under normal working conditions, the real time display will show a black box just to the left of the machine parameters field.

The MIU maintains a timer that indicates the time required to collect the machine parameter data from the PLC. This timer can be displayed from the MIU front panel on the service display.

MIU/PLC interfacing is provided by firmware installed in the MIU for a specific PLC and is supported by ProHelp Release 2.1 or greater.

NOTE: This document assumes a working knowledge of ProHelp operations. Please refer to the *ProHelp 1000 Operator's Manual # 710-0039, ProHelp (Millennium Release 2.4x) Operator's Manual #710-0068, ProHelp (Millennium Release 2.5x) Operator's Manual #710-0073, ProHelp (Millennium Release 2.6x) Operator's Manual #710-0087, ProHelp (Millennium Release 2.7x) Operator's Manual #710-0088* for more information.

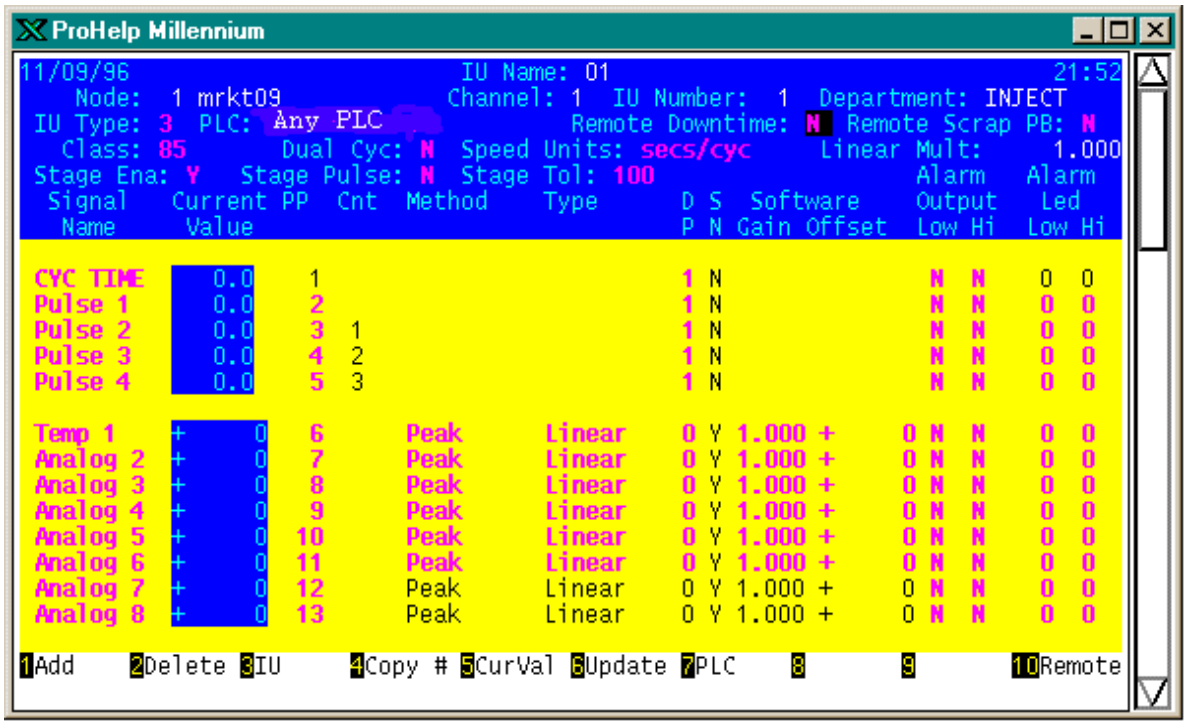

Figure 1-1 MIU Definition Page

NOTE: This is a typical PLC Definition Page

This screen (Figure 1-1 MIU Definition Page) is accessed through System Manager. Once in this screen, for each MIU, place the cursor on the "*PLC* " field. Use of the space bar will display a pick list of available PLC interfaces. Select the desired interface and hit "*Enter*". Signals available for the different types of PLC interfaces are then selected via that PLC's MIU Definition Page. These are described in the appropriate section of the manual

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2. Special Requirements/Restrictions

The following list contains nine Mattec supported PLC interfaces that have special requirements or restrictions:

Buhl PPC 90

The customer's cycle time must be 14 seconds or greater.

Cincinnati Milacron ACT

The customer's cycle time must be 10 seconds or greater.

Cincinnati Milacron XTL

The customer's cycle time must be 7 seconds or greater.

Siemens AS511/Demag

a. The restriction on the customer's minimum cycle time depends on both the type of control (for example - VanDorn EL Path Finder) and the parameters selected. For a specific application, after the parameters desired and the type of control are determined, contact Mattec's Engineering Department for the required cycle time.

b. Standard resolution for time values are required.

Battenfeld Unilog 4000B

a. Only 10 parameters (instead of 11) can be monitored.
b. The software revision on the Unilog 4000B must be 5.04 or greater.

SCI Scoremaster

Currently, only 8 parameters can be monitored via the PLC:

1. cycle time
2. fill time
3. screw recovery time
4. mold open time
5. packing time
6. corrected shot size
7. cushion
8. pressure at transfer

Klöckner MPC-80

The customer's cycle time must be 20 seconds or greater.

Gefran Elettronica

The customer's cycle time must be 8 seconds or greater.

NOTE: All times are based on the assumption that all PLC parameters are enabled.

Nissei

All Nissei controls use a fiber optic converter. The interface switch on the converter will allow correct operation in one setting only.

3. PLC Interfaces

This chapter contains the various MIU/PLC interfaces that Mattec Corporation currently supports, and the information necessary to install and setup a particular interface for monitoring.

3.1 Allen Bradley

The Allen Bradley host communications interface provides data interchange for many items within the control. The ProHelp - Allen Bradley interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

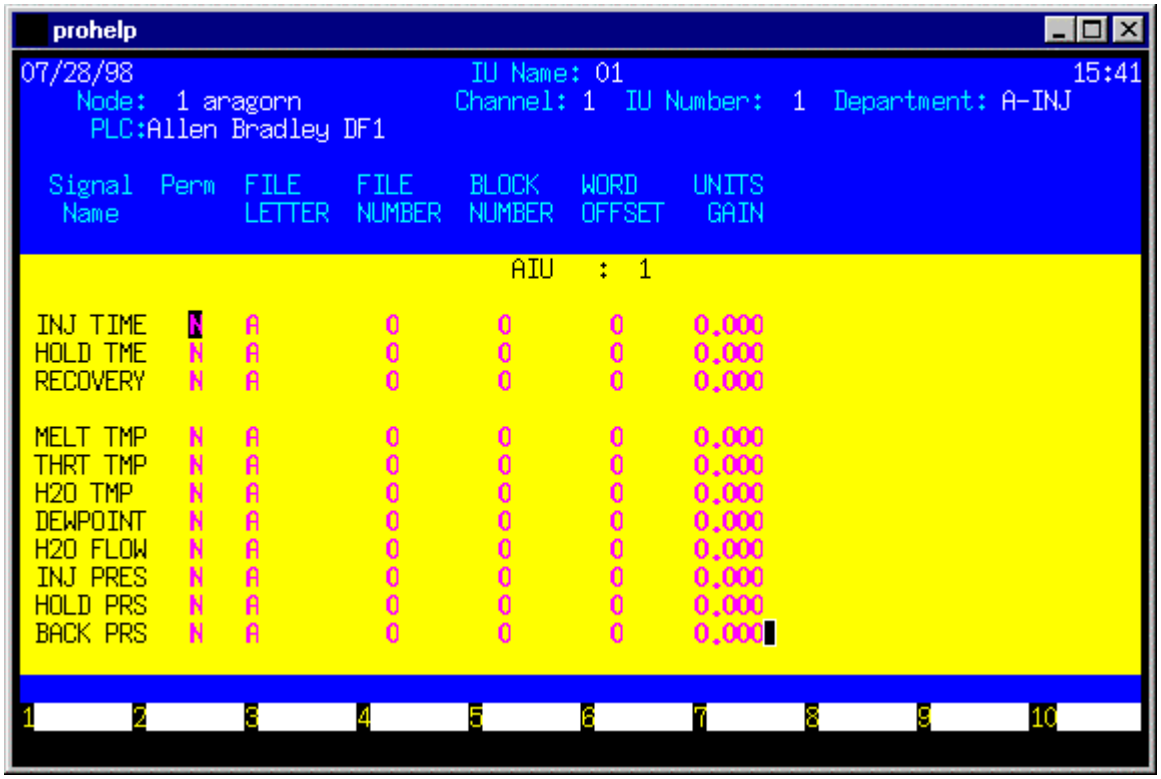

Figure 3-1 Allen Bradley PLC Definition Page

Several pieces of information need to be entered via the PLC Definition page to monitor data items. Most of this information is found in your Allen Bradley documentation.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the "*FILE LETTER*", "*FILE NUMBER*", "*BLOCK NUMBER*", "*WORD OFFSET*", and "*UNITS GAIN* " fields can be determined from your Allen Bradley documentation.

To exit the screen, press: ***"ESC"***

3.2 Barber Coleman MACO 8000

The Barber Coleman MACO 8000 host communications interface provides data interchange for many items within the control. The ProHelp - MACO 8000 interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

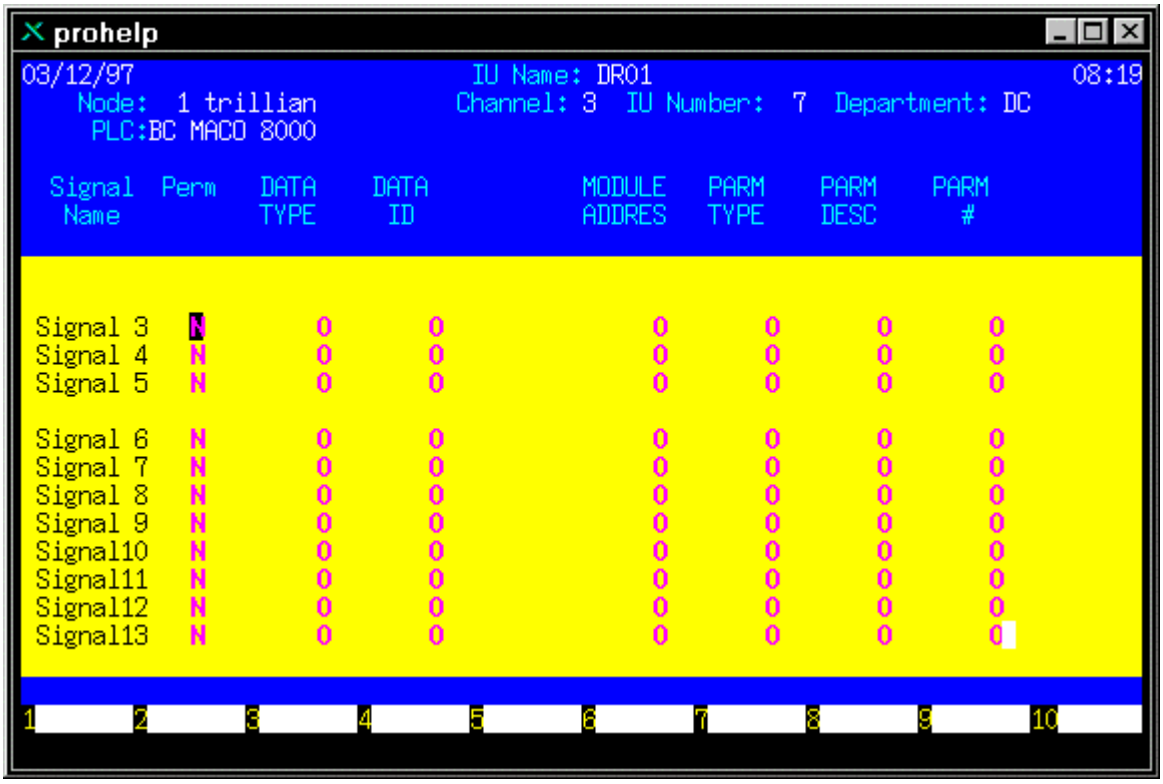

Figure 3-1 Barber Coleman MACO 8000 PLC Definition Page

Several pieces of information need to be entered via the PLC Definition page to monitor data items. Most of this information is found in your Barber Coleman MACO 8000 documentation.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the "*DATA TYPE", "DATA ID", "MODULE ADDRES", "PARM TYPE", "PARM DESC*", and *"PARM #"* fields can be determined from your Barber Coleman MACO 8000 documentation.

To exit the screen, press: ***"ESC"***

3.3 Battenfeld Unilog 4000B

The Battenfeld Unilog 4000B host communications interface provides data interchange for many items within the controller. The ProHelp - UNILOG interface allows the user to monitor various machine temperatures, positions, pressures, and timers. Please refer to the PLC manufacturer for a list of available parameters and their identifiers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

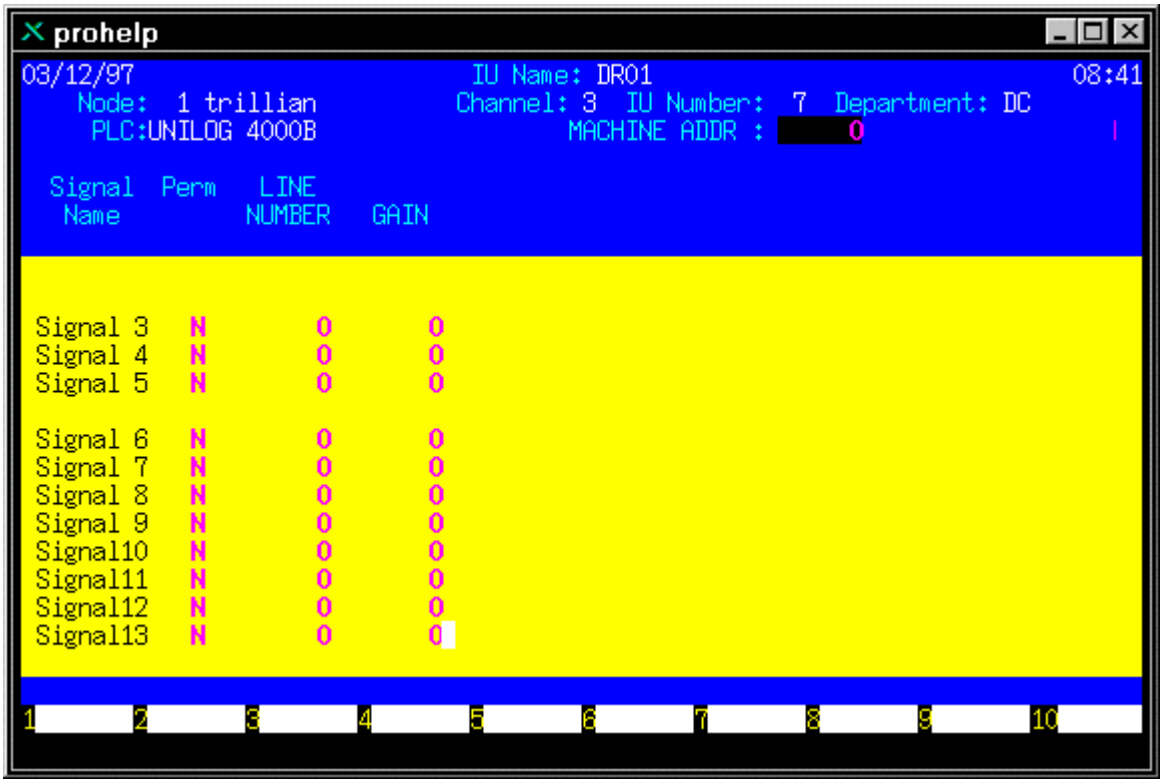

Figure 3-1 Battenfeld Unilog 4000B PLC Definition Page

Two items of information need to be entered via the PLC Definition page to monitor data items in the Unilog 4000B control.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. The Unilog 4000B PLC Definition page requires both a line number and gain for each parameter. The "*LINE NUMBER*" is acquired from the Unilog 4000B's text EPROM and can be viewed from the CRT interface on the Battenfeld machine. Contact Battenfeld for information on the location of these values. The "*GAIN*" entry is for scaling the Pulse values in the ProHelp system (i.e. to remove the automatic one place decimal, place a 10 in the *"GAIN"* column. If no gain is required, place a 1 in the column).

To exit the screen, press: ***"ESC"***

3.4 Buhl PPC 90

The Buhl PPC 90 host communications interface provides data interchange for many items within the controller. The ProHelp - Buhl interface allows the user to monitor various machine temperatures, positions, pressures, and timers. This interface supports both the IMP 2020 and the PPC 2022 Buhl machines. Refer to the PLC manufacturer for a list of available parameters and their identifiers *(BUHL - Manl 4, revision 02, Feb 1990)* . ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Buhl PPC90 PLC Definition Page

In order to monitor data from the Buhl controller, two items of information need to be entered via the PLC Definition page. All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the "*ITEM ID*" field can be determined from your *Buhl PPC 90 Host Communications Protocol Documentation (Manl 4, revision 02, Feb 1990)*. The "*GAIN*" field is for scaling the Pulse values in the ProHelp system (i.e. to remove the automatic one place decimal, place a 10 in the *"GAIN"* column. If no gain is required, place a 1 in the column).

NOTE: If an invalid "*ITEM ID*" is entered, the value of 32769 or -32767 will be displayed as the current value.

To exit the screen, press: ***"ESC"***

3.5 Cincinnati Milacron/Fanuc ACT

The Cincinnati Milacron Fanuc/ACT host communication interface provides data interchange for many items within the controller. The ProHelp - ACT interface allows the user to monitor various machine temperatures, positions, pressures, and timers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

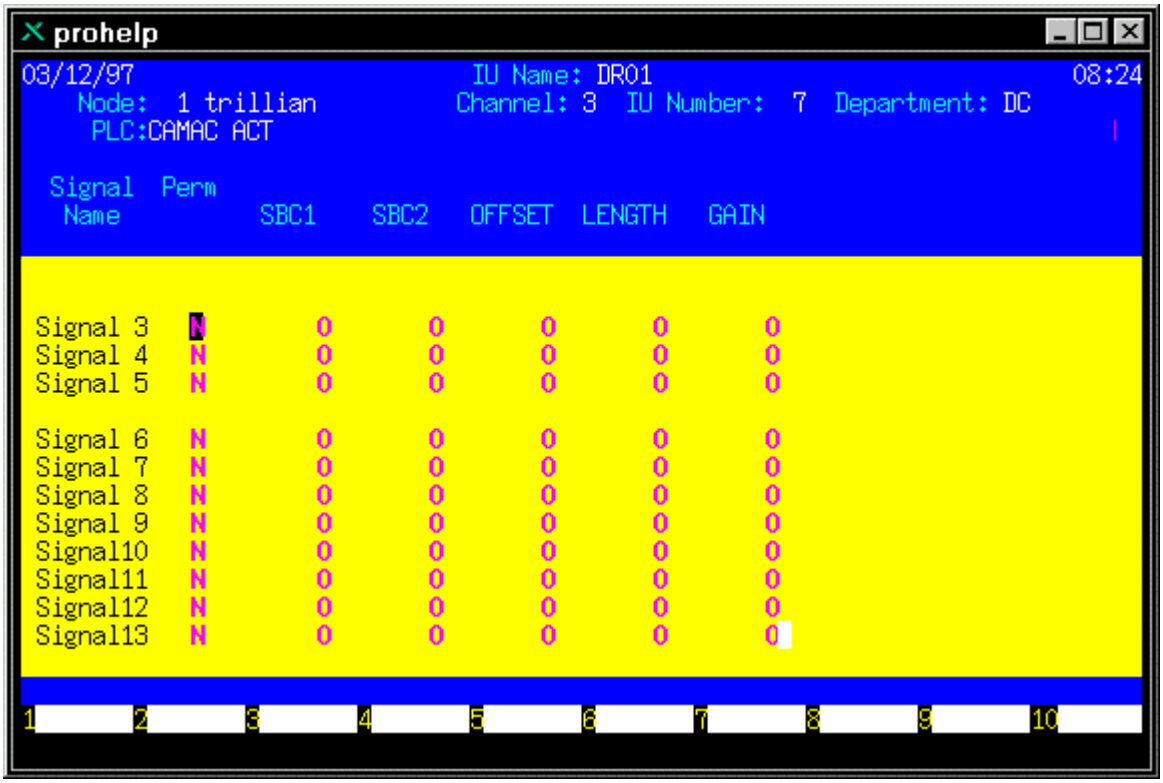

Figure 3-1 Cincinnati Milacron ACT PLC Definition Page

Five items of information need to be entered via the PLC Definition page to monitor data items in the ACT PLC.

All data items to be monitored must be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. The entries for the *"SBC1"*, *"SBC2"*, *"OFFSET"*, *"LENGTH"*, and *"GAIN"* fields can be determined from your Cincinnati Milacron ACT documentation.

NOTE: The "*GAIN*" field must contain a positive integer (a "GAIN" of zero will force the data value to be zero). The "*SBC1*" field should be set to a value between 1 - 7 and the "*SBC2*" field should be set to value between 0 - 9. These values are the same as command 1 and command 2 as described in the Cincinnati Milacron ACT documentation. The definitions for these translated values are in the table below. The "*OFFSET*" field is the data column described in the Cincinnati Milacron ACT documentation defining the starting point of the desired data to be displayed. The "*LENGTH*" field is the length of the parameter and is shown in the Cincinnati Milacron documentation.

Cincinnati Milacron ACT SBC1 Parameters

ProHelp Entry	ACT Request	ACT Reply	Definition
1	C	E	Request max and min data
2	D	F	Request max and min data (res)
3	G	I	Request injection molding data
4	H	J	Request injection molding data (res)
5	K	L	Request monitoring data
6	M	N	Request diagnostic or alarm data
7	S	T	Request machine status

PLC Defintion Example:

In Cincinnati Milacron's ACT manual, the following is displayed:

CMD **I2**: molding data

Column No.	length	contents
1 ~ 2	2	extruder step
4 ~ 8	**6**	**back pressure 1**

If the parameter to be monitored is back pressure 1, then *SBC1* is '3' (from the table on the previous page - CMD **I**2 = ProHelp Entry '3'), SBC2 is '2' (CMD I**2**), the *OFFSET* is "4" (the first Column Number), and the *LENGTH* is '6'.

To exit the screen, press: ***"ESC"***

3.6 Cincinnati Milacron Camac VLC/VEL

The Cincinnati Milacron CAMAC VLC/VEL host communications interface provides data interchange for many items within the controller. The ProHelp - CAMAC VLC/VEL interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

NOTE: The Cincinnati Milacron CAMAC VLC/VEL controller is essentially identical to the CAMAC XTA/XTC controller (from a data monitoring stand point). The difference lies in the "*Units Gain*" and "*Units Offset*" data entries.

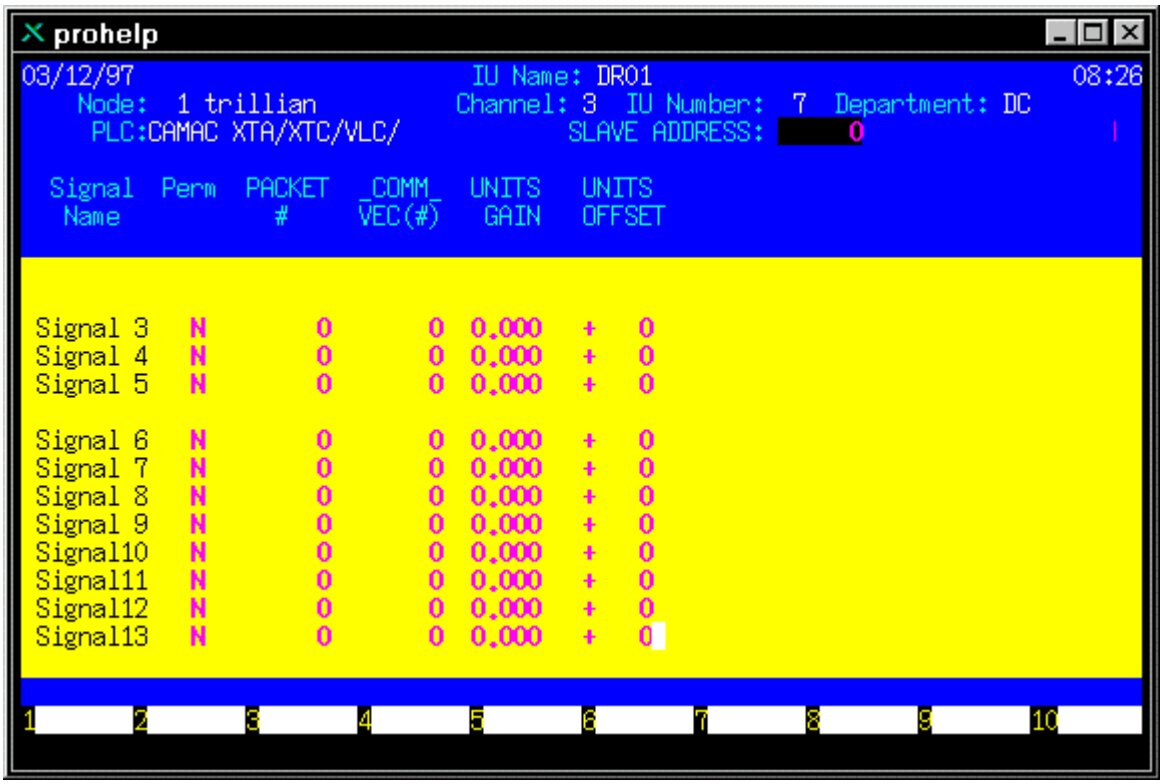

Figure 3-1 Cincinnati Milacron CAMAC VLC/VEL PLC Definition Page

Five items of information need to be entered via the PLC Definition page to monitor data items in the CAMAC VLC/VEL control.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"PACKET #", "COMM_VEC(#)", "UNITS GAIN"*, and *"UNITS OFFSET"* fields can be determined from your Cincinnati Milacron CAMAC VLC/VEL documentation.

To exit the screen, press: ***"ESC"***

NOTES:

1. Data monitored in the CAMAC VLC/VEL controllers is in measuring units, and the "UNITS GAIN" and "UNITS OFFSET" fields need to be set to the appropriate values. Refer to your Cincinnati Milacron CAMAC VLC/VEL documentation to determine the correct values for these fields.

2. The middle two jumpers on the MBA board activate the RCV and SEND 121 ohm resistors. These jumpers should be removed for proper operation. The MBA board is located behind the aluminum guard panel on the VLC/VEL Cincinnati Milacron machine.

PLC Definition Example:

_____

To determine the "*UNITS GAIN*" and "*UNITS OFFSET*" for the screw position (cushion or transfer), search Cincinnati Milacron's documentation for the section "*SLOPES FOR LCD CONVERSIONS*" and find "*SCREW POSITION*" *(Packet 139, comm_vec 1385).*

Through ProHelp, get the value at packet 139, comm_vec 1385 (For this step, set *GAIN* = to 1 and *OFFSET* = to 0). If the value were 5776 (ignore all decimal place locations) then 1/5776 (1 divided by 5776) = 0.000173. From this, "*UNITS GAIN*" from the cushion position (or transfer position) becomes 0.173 (remove leading zero).

For the offset, search Cincinnati Milacron's documentation for the section "*OFFSETS FOR LCD CONVERSION*" and find "*SCREW POSITION*".

Through ProHelp, get the value and place it in the "*UNITS OFFSET*" column for the cushion position (No calcs. needed - normally offset is zero).

3. Slave addresses are never 0. Normally the slave address is 1. See the Cincinnati Milacron host interface specification.

WARNING: Once the proper slave address is determined, 0's for any enabled signal will cause the machine control to lock up.

3.7 Cincinnati Milacron Camac XTA/XTC

The Cincinnati Milacron CAMAC XTA/XTC host communications interface provides data interchange for many items within the controller. The ProHelp - CAMAC XTA/XTC interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

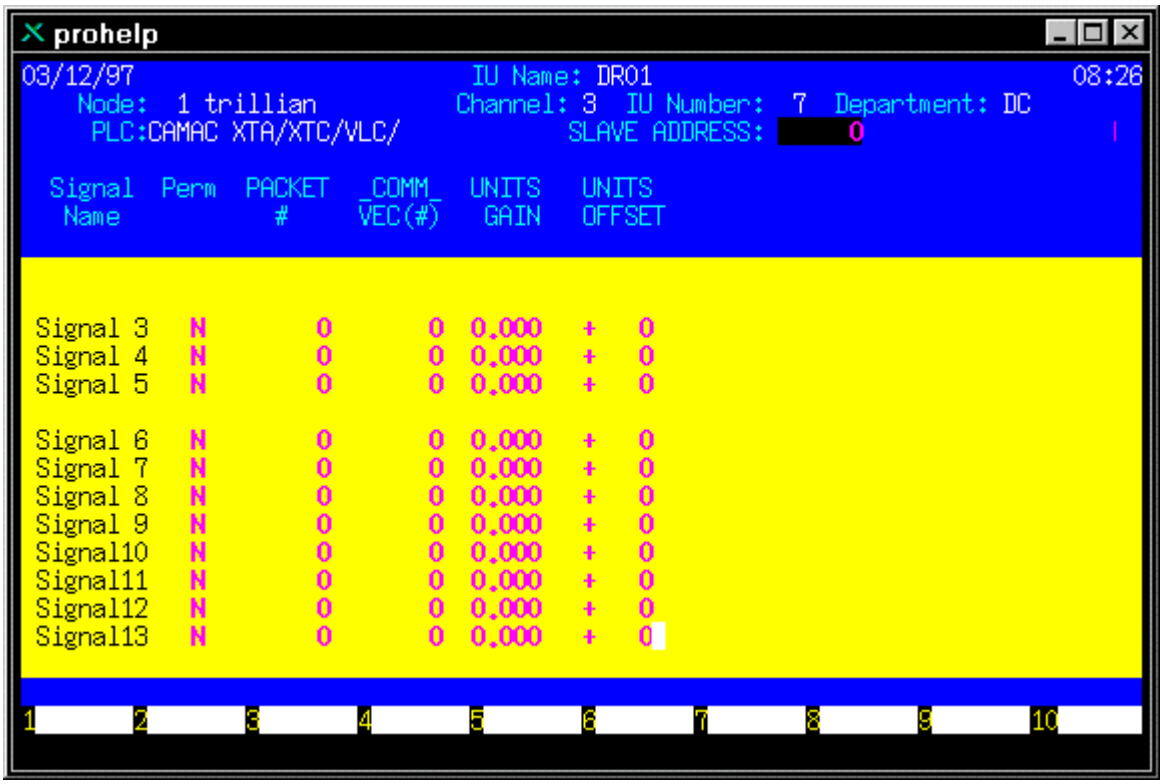

Figure 3-1 Cincinnati Milacron CAMAC XTA/XTC PLC Definition Page

Five items of information need to be entered via the PLC Definition page to monitor data items in the CAMAC XTA/XTC controller.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"PACKET #"*, *"COMM_VEC(#)"*, *"UNITS GAIN"*, and *"UNITS OFFSET"* fields can be determined from your Cincinnati Milacron CAMAC XTA/XTC documentation.

NOTE: Data monitored in the CAMAC XTA/XTC controllers is in process units; and unless otherwise noted, the "*UNITS GAIN*" field should be set for a value of 1.000, and the "*UNITS OFFSET*" field set for a value of 0. Refer to your Cincinnati Milacron CAMAC XTA/XTC documentation for more information.

To exit the screen, press: ***"ESC"***

3.8 Cincinnati Milacron Camac XTL

The Cincinnati Milacron CAMAC XTL host communications interface provides data interchange for many items within the controller. The ProHelp - CAMAC XTL interface allows the user to monitor various machine temperatures, positions, pressures and timers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

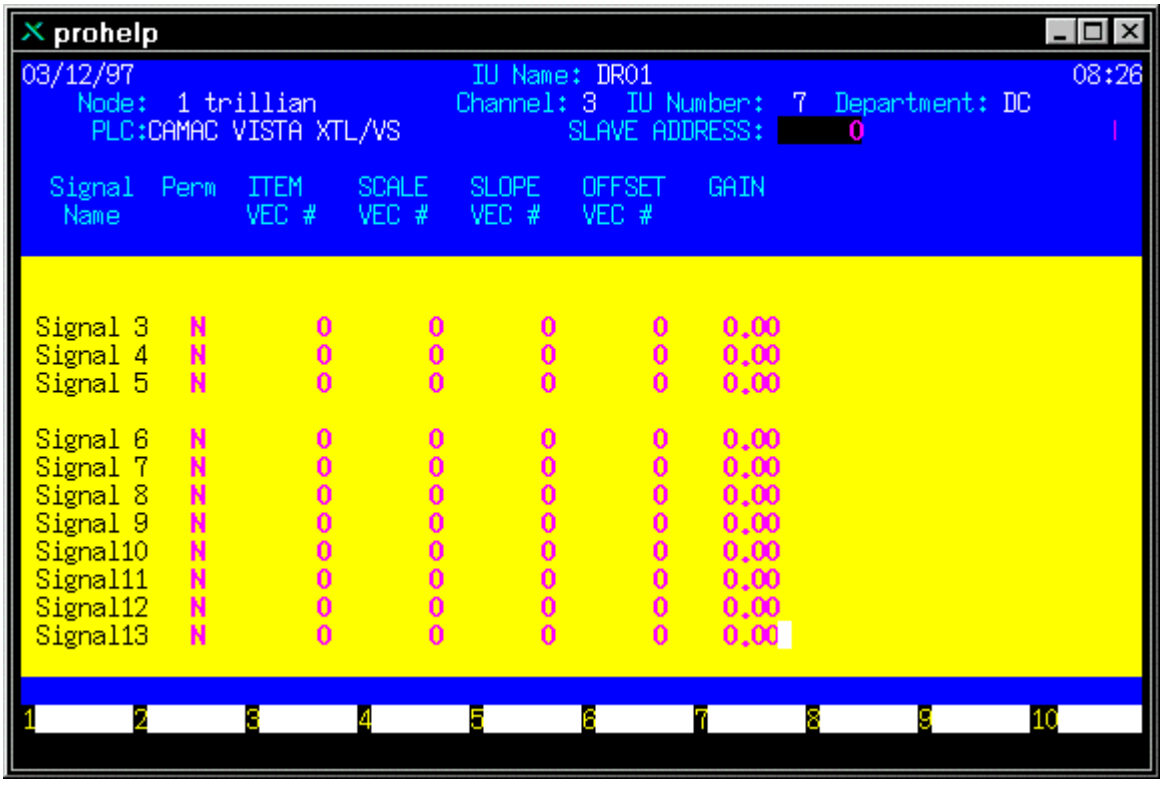

Figure 3-1 Cincinnati Milacron CAMAC XTL PLC Definition Page

Four pieces of information are needed for each item that will be monitored - the *"ITEM"*, *" SCALE"*, *"SLOPE"*, and *"OFFSET"* vector numbers.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type a '*Y*' to enable a signal to be monitored. Entries for the *"ITEM VEC#"*, *"SCALE VEC#"*, *"SLOPE VEC#"*, and the *"OFFSET VEC#"* fields can be determined form your Cincinnati Milacron CAMAC XTL documentation. When entering an "*ITEM VEC#*", note the convert index associated with the item. The "*SCALE VEC#*", "*SLOPE VEC#*", and the "*OFFSET VEC#"* can then be determined by matching the correct convert index from the SCALING DATA table. *(Reference Appendix A of this manual.)*

To exit the screen, press: ***"ESC"***

NOTES:

1. For *CONVERT* index numbers greater than or equal to 255, take the convert number and subtract 255 from it. Additionally, ignore all negative *CONVERT* numbers (assume absolute value).

2. In *s_miu*, the decimal places column for the analog signals changes the precision of the number, rather than the location of the decimal. For example, if the number displayed at the CAMAC XTL PLC is 0.659, then ProHelp would yield the following results:
3.

Dec Pls	**<would be displayed as …>**
0	0
1	0.6
2	0.65
3	0.659

The precision of the first three signal values cannot be changed.

3. The time required for the MIU to gather data from the PLC can be as long as 6 seconds; therefore, the CAMAC XTL PLC interface is not recommended for cycle times less than 7 seconds.

4. The '*Slave Address*' in ProHelp must be the same as the '*Machine ID*' at the CAMAC XTL

5. The host communication baud rate at the CAMAC XTL must be set to 4800.

PLC Definition Example:

_____

In figure 3.7.2, PULSE 2 contains a RW_CONV_VEC number (ITEM VEC # - 1175) for "Zone 1" temperature (Refer to Table "ACTUAL CYCLE DATA" - Cincinnati Milacron's XTL Documentation).

For Zone 1 temperature, the Convert Index is zero (Unity), therefore, the Scale (SCALE VEC #) RW_CONV_VEC number is 1040, the Slope (SLOPE VEC #) is 1080, and the offset (OFFSET VEC #) is 1120 (Scale, Slope, and Offset is located in the Table "SCALING DATA" - Cincinnati Milacron's XTL Documentation).

3.9 Cincinnati Milacron Ferromatic

The Cincinnati Milacron Ferromatic host communications interface provides data interchange for many items within the controller. The ProHelp - Ferromatic interface allows the user to monitor various machine temperatures, positions, pressures and timers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

NEED REAL SCREEN HERE:

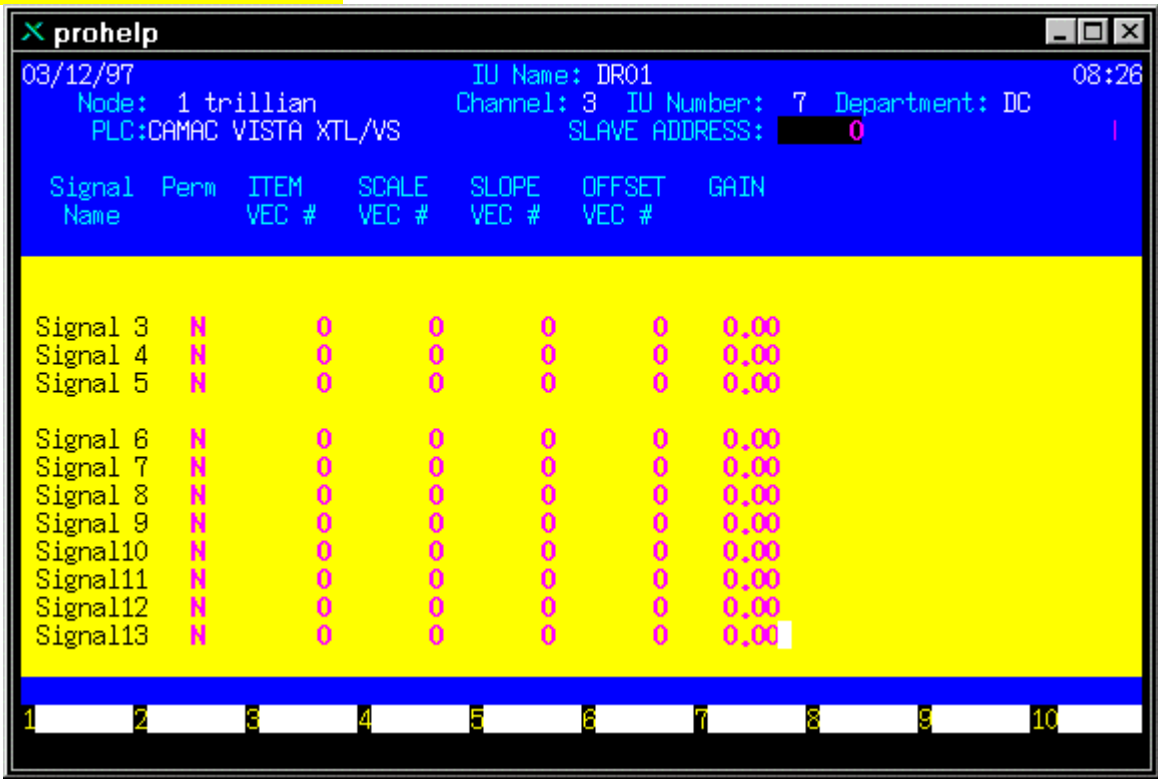

Figure 3-1 Cincinnati Milacron Ferromatic PLC Definition Screen

NEED REAL TEXT IN THIS PART: Four pieces of information are needed for each item that will be monitored - the "*ITEM*", " *SCALE*", "*SLOPE*", and "*OFFSET*" vector numbers.

All data items to be monitored MUST be enabled in the "*Perm*" field of the PLC Definition page. Type a '*Y*' to enable a signal to be monitored. Entries for the *"ITEM VEC#"*, *"SCALE VEC#"*, *"SLOPE VEC#"*, and the *"OFFSET VEC#"* fields can be determined form your Cincinnati Milacron CAMAC XTL documentation. When entering an "*ITEM VEC#*", note the convert index associated with the item. The "*SCALE VEC#*", "*SLOPE VEC#*", and the "*OFFSET VEC#*" can then be determined by matching the correct convert index from the SCALING DATA table. *(Reference Appendix A of this manual.)*

To exit the screen, press: ***"ESC"***

3.10 Engel EC88/CC90

The Engel EC88/CC90 host communications interface provides data interchange for many items within the controller. The ProHelp - Engel interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Engel EC88/CC90 PLC Definition Page

Two items of information need to be entered via the PLC Definition page to monitor data items in the Engel controller.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"GROUP MEMBER"* and *"MEMBER NUMBER"* fields can be determined from your Engel EC88/CC90 documentation.

NOTE: The EC88/CC90's host communications port must be configured for 4800 baud.

To exit the screen, press: ***"ESC"***

3.11 Gefran Elettronica

The Gefran Elettronica host communications interface provides data interchange for many items within the control. The ProHelp - Gefran Elettronica interface allows the user to monitor various registers within Gefran controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

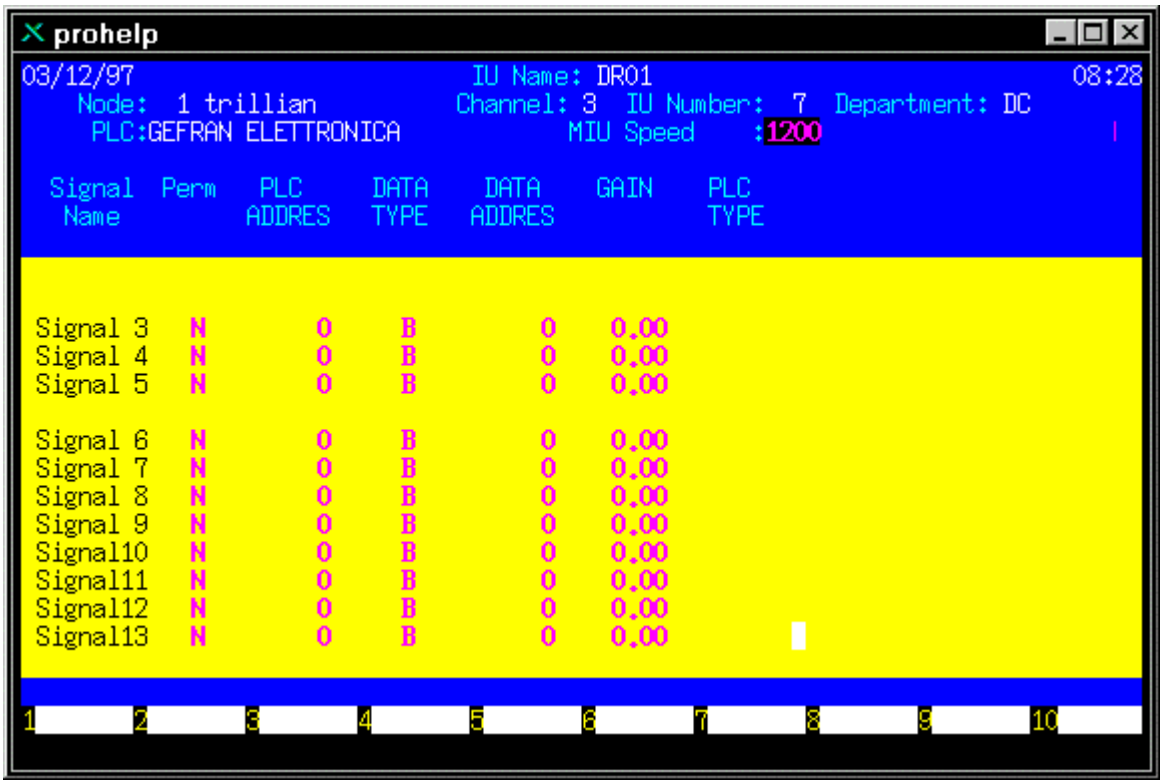

Figure 3-1 Gefran Elettronica PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Five items of information need to be entered via the PLC Definition page to monitor data items in the Gefran Elettronica control. The Gefran Elettronica PLC Definition page requires a MIU speed, *"PLC ADDRESS"*, *"DATA TYPE"*, *"DATA ADDRESS"*, *"GAIN"* and *"PLC TYPE"*.

The "MIU SPEED" entry is the baud rate of the PLC interfaced to the MIU. The baud rates to choose from are 1200, 4800 and 9600. If this field is changed, the MIU's power must be cycled.

To select a particular baud rate:

Place the cursor on the entry
Press: ***left shift button down***
Hit: ***greater than sign (>)***
Once you see the correct selection:
Press: ***(enter)***

The "*PLC ADDRESS*" entry is the address of the PLC that is being used to monitor a particular parameter.

The "*DATA TYPE*" entry is the number of bytes to be read from the PLC *(refer to the Gefran PLC Manual under the Memory Map section*). A ***(W)*** represents 2 bytes and a ***(B)*** represents 1 byte.

To select ***(W)*** or ***(B)***:

Place cursor on the entry
Press: ***left shift button down***
Hit: ***greater than sign (>)***
Once you see the correct selection:
Press: ***(enter)***

The *"DATA ADDRESS"* entry is the address of the data register at the PLC *(refer to the Gefran PLC Manual under the Memory map section)*. See note.

The *"GAIN"* entry is for scaling the pulse values in the ProHelp system (i.e. to remove the automatic one place decimal, place a 10 in the *"GAIN"* column. If no gain is required place a 1 in the column).

The *"PLC TYPE"* entry is a 6 character label to represent the type of PLC used for a particular parameter.

NOTE: ALL NUMERIC ENTERIES MUST BE IN DECIMAL FORM. For example, address H6F would be 111 in decimal. See *Appendix A - Hexidecimal to Decimal Conversion Table*.

To exit the screen, press: ***"ESC"***

3.12 Gefran Elettronica Negri EL2

The Gefran Elettronica Negri EL2 host communications interface provides data interchange for many items within the control. The ProHelp - Negri EL2 interface allows the user to monitor various registers within Gefran controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

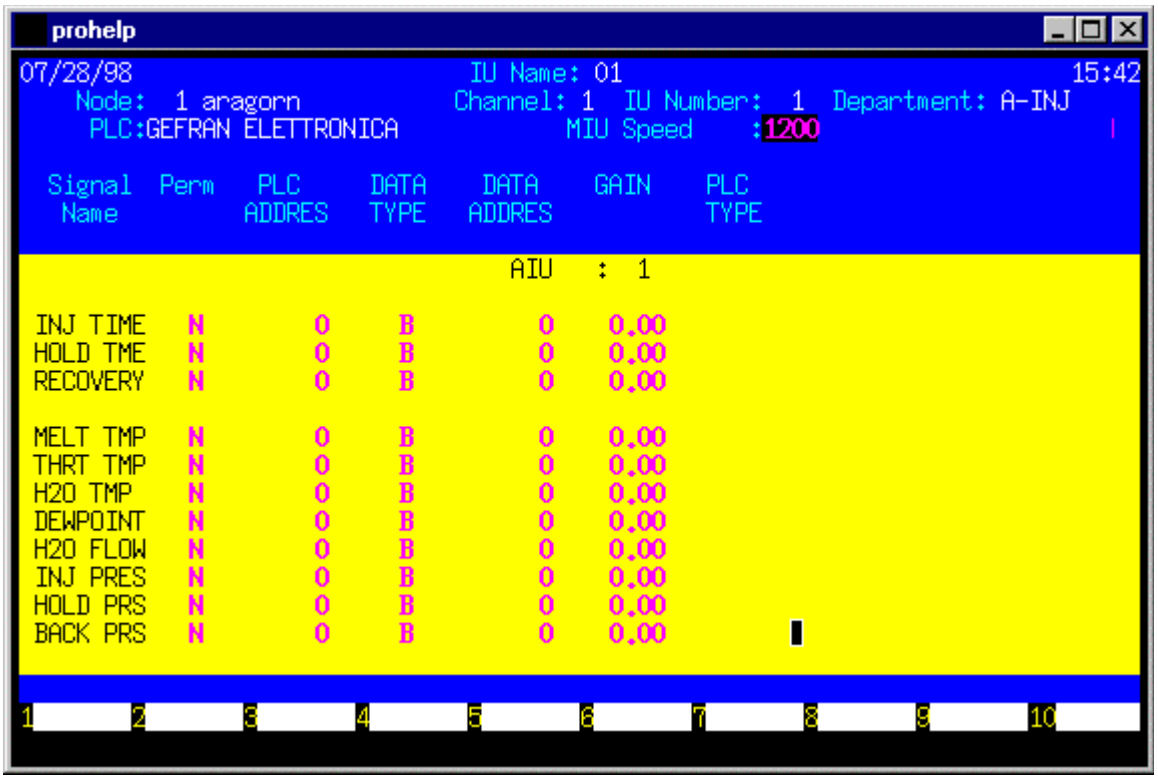

Figure 3-1 Gefran Elettronica Negri EL2 PLC Definition Screen

NEED REAL DATA HERE: All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Five items of information need to be entered via the PLC Definition page to monitor data items in the Gefran Elettronica control. The Gefran Elettronica PLC Definition page requires a MIU speed, *"PLC ADDRESS"*, *"DATA TYPE"*, *"DATA ADDRESS"*, *"GAIN"* and *"PLC TYPE"*.

The "MIU SPEED" entry is the baud rate of the PLC interfaced to the MIU. The baud rates to choose from are 1200, 4800 and 9600. If this field is changed, the MIU's power must be cycled.

To select a particular baud rate:

Place the cursor on the entry
Press: ***left shift button down***
Hit: ***greater than sign (>)***

Once you see the correct selection:
Press: ***(enter)***

The "*PLC ADDRESS*" entry is the address of the PLC that is being used to monitor a particular parameter.

The "*DATA TYPE*" entry is the number of bytes to be read from the PLC *(refer to the Gefran PLC Manual under the Memory Map section*). A ***(W)*** represents 2 bytes and a ***(B)*** represents 1 byte.

To select ***(W)*** or ***(B)***:

Place cursor on the entry
Press: ***left shift button down***
Hit: ***greater than sign (>)***
Once you see the correct selection:
Press: ***(enter)***

The *"DATA ADDRESS"* entry is the address of the data register at the PLC *(refer to the Gefran PLC Manual under the Memory map section).* See note.

The *"GAIN"* entry is for scaling the pulse values in the ProHelp system (i.e. to remove the automatic one place decimal, place a 10 in the *"GAIN"* column. If no gain is required place a 1 in the column).

The *"PLC TYPE"* entry is a 6 character label to represent the type of PLC used for a particular parameter.

NOTE: ALL NUMERIC ENTERIES MUST BE IN DECIMAL FORM. For example, address H6F would be 111 in decimal. See *Appendix A - Hexidecimal to Decimal Conversion Table.*

To exit the screen, press: ***"ESC"***

NOTES: Parameter Address List for Gefran EL2 NegriBossi PLC

NBV2R07 and NBV2R10 Software:

Melt Temp	43,054 (A82E)
Mould Temp - Moving	43,056 (A830)
Mould Temp - Fixed	43,058 (A832)
Filling Time	43,060 (A834)
Plasticising Time	43,062 (A836)
Cycle Time	43,064 (A838)
Clamping Force	43,066 (A83A)
Cushion Position	43,068 (A83C)
Switchover Position	43,070 (A83E)
Plasticising Position	43,072 (A840)
Max Injector Speed	43,074 (A842)
Max Screw Rotate Speed	43,078 (A846)
Mean Screw Rotate Speed	43,080 (A848)
Max Injection Pressure	43,082 (A84A)
Switchover Hydraulic Pressure	43,084 (A84C)
Max Back Pressure	43,086 (A84E)
Mean Back Pressure	43,088 (A850)
Cavity Pressure Switchover	43,090 (A852)
Max Cavity Pressure	43,092 (A854)
Injection Energy	43,094 (A856)

NBV1R101 and NBV3R50 Software:

Melt Temp	43,168 (A8A0)
Mould Temp - Moving	43,170 (A8A2)
Mould Temp - Fixed	43,172 (A8A4)
Filling Time	43,174 (A8A6)
Plasticising Time	43,176 (A8A8)
Cycle Time	43,178 (A8AA)
Clamping Force	43,180 (A8AC)
Cushion Position	43,182 (A8AE)
Switchover Position	43,184 (A8B0)
Plasticising Position	43,186 (A8B2)
Max Injector Speed	43,188 (A8B4)
Max Screw Rotate Speed	43,192 (A8B8)
Mean Screw Rotate Speed	43,194 (A8BA)
Max Injection Pressure	43,196 (A8BC)
Switchover Hydraulic Pressure	43,198 (A8BE)
Max Back Pressure	43,200 (A8C0)
Mean Back Pressure	43,202 (A8C2)
Cavity Pressure Switchover	43,204 (A8C4)
Max Cavity Pressure	43,206 (A8C6)
Injection Energy	43,208 (A8C8)

PLC address must always be "0" zero. Data Type for all of the above listed parameters must be "W". MIU speed must be set at 9600.

3.13 Gefran NegriBossi Printer PLC

The Gefran NegriBossi Printer PLC host communications interface provides data interchange for many items within the control. The ProHelp Gefran NegriBossi Printer PLC interface allows the user **WHAT?**

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

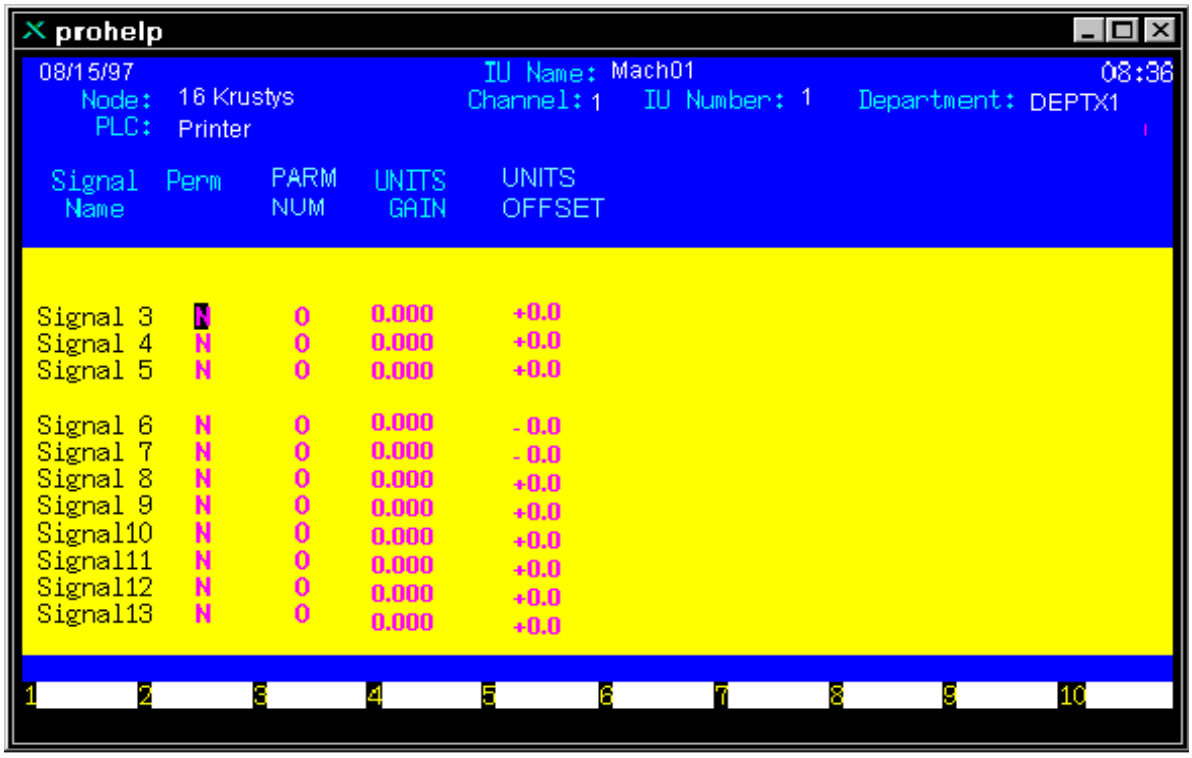

Figure 3-1 Gefran NegriBossi Printer Definition Screen

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Four items of information need to be entered via the PLC Definition page to monitor data items in the Gefran NegriBossi Printer PLC control. The Gefran NegriBossi Printer PLC Definition page requires a *PLC address, "PARM NUM", "UNITS GAIN"* and *"UNITS OFFSET"*.

NOTES: Machine must be set to "auto print" every cycle. Parameters can be identified by the last 10 cycles screen on the machine control panel or by the following printout example.

Printer Example:

Cycle No.	Cycle Time (sec)	Inject Time (sec)	Plast Time (sec)	Cushi Size (mm)	Hydra Peak (bar)
13	58.0	6.3	12.5	1.4	20

3.14 GE Fanuc

The GE Fanuc interface provides data interchange for many items within the control. The ProHelp GE Fanuc interface allows the user to monitor various registers within GE Fanuc controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the *"PLC"* field.

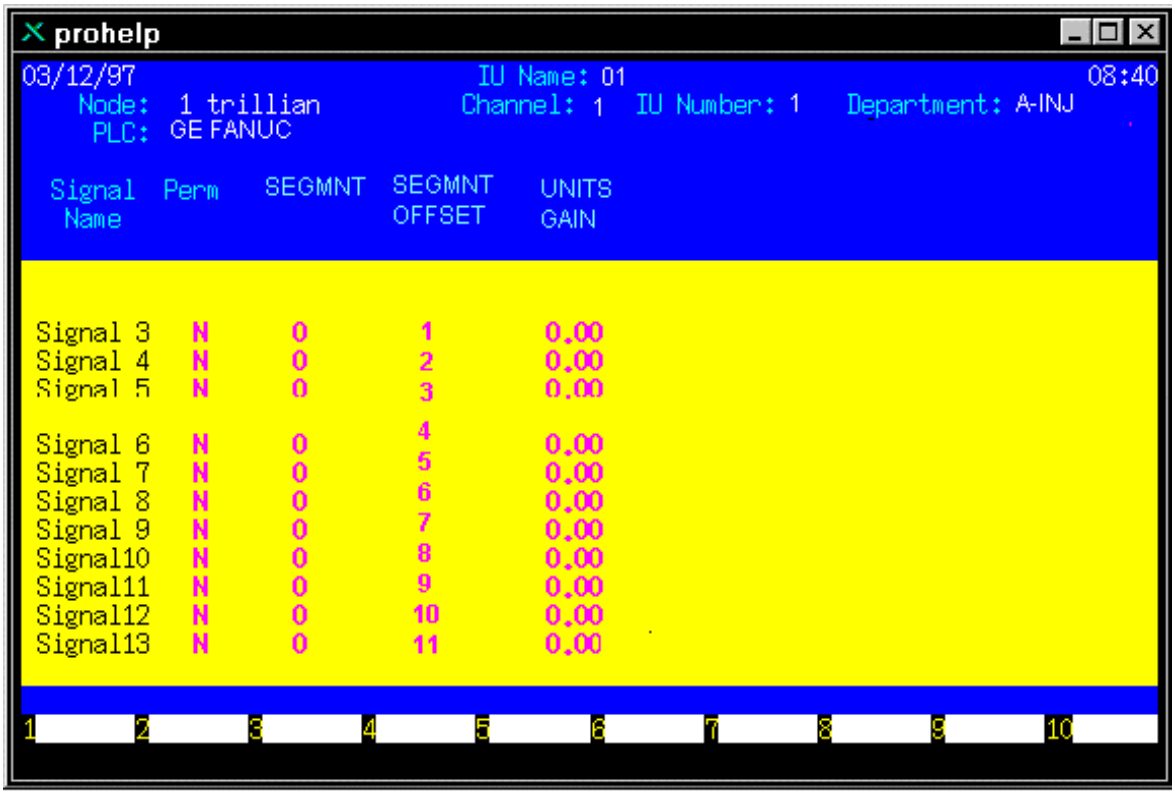

Figure 3-1 GE Fanuc PLC Definition Screen

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Three items of information need to be entered via the PLC Definition page to monitor data items in the GE Fanuc PLC control. The Gefran NegriBossi Printer PLC Definition page requires a *"SEGMNT"*, *"SEGMNT OFFSET"* and *"UNITS GAIN"*.

To exit the screen, press: ***"ESC"***

3.15 HPM CMD90

The HPM CMD90 host communications interface provides data interchange for many items within the control. The ProHelp - HPM CMD90 interface allows the user to monitor various registers within HPM CMD90 controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 HPM CMD 90 PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Three items of information need to be entered via the PLC Definition page to monitor data items in the HPM CMD 90 PLC control. The HPM CMD 90 PLC Definition page requires a *"PLC PACKET"*, *"SCALE FACTOR"* and *"UNITS GAIN"*.

To exit the screen, press: ***"ESC"***

3.16 Inoex Saveomat

The Inoex Saveomat host communications interface provides data interchange for many items within the control. The ProHelp - Inoex Saveomat interface allows the user to monitor various registers within Inoex Saveomat controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Inoex Saveomat PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Two items of information need to be entered via the PLC Definition page to monitor data items in the Inoex Saveomat PLC control. The Inoex Saveomat PLC Definition page requires a *"PLC PARM #"* and *"UNITS GAIN"*.

To exit the screen, press: ***"ESC"***

3.17 Inoex Saveomat 93

The Inoex Saveomat 93 host communications interface provides data interchange for many items within the control. The ProHelp - Inoex Saveomat 93 interface allows the user to monitor various registers within Inoex Saveomat 93 controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Inoex Saveomat 93 PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Two items of information need to be entered via the PLC Definition page to monitor data items in the Inoex Saveomat 93 PLC control. The Inoex Saveomat 93 PLC Definition page requires a *"PARM ID"* and *"UNITS GAIN"*.

The following item is a key point in making the Inoex Saveomat 93 interface operate correctly: The baud rate should be configured for 9600 (no partity).

Inoex 93 Screen Description
PARM ID - This number is used to choose the data position in the data stream.

GAIN - This number is used to change decimal places to a resolution ProHelp can understand. ProHelp can only use 0 to 3 decimal places.

To exit the screen, press: ***"ESC"***

3.18 Klöckner FMT

The Klöckner Ferromatik Desma (FMT) host communications interface provides data interchange for many items within the controller. The ProHelp - Klöckner interface allows the user to monitor various machine temperatures, positions, pressures, and timers. This interface supports the Klöckner machine with the Phillips Control as opposed to the MPC80.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

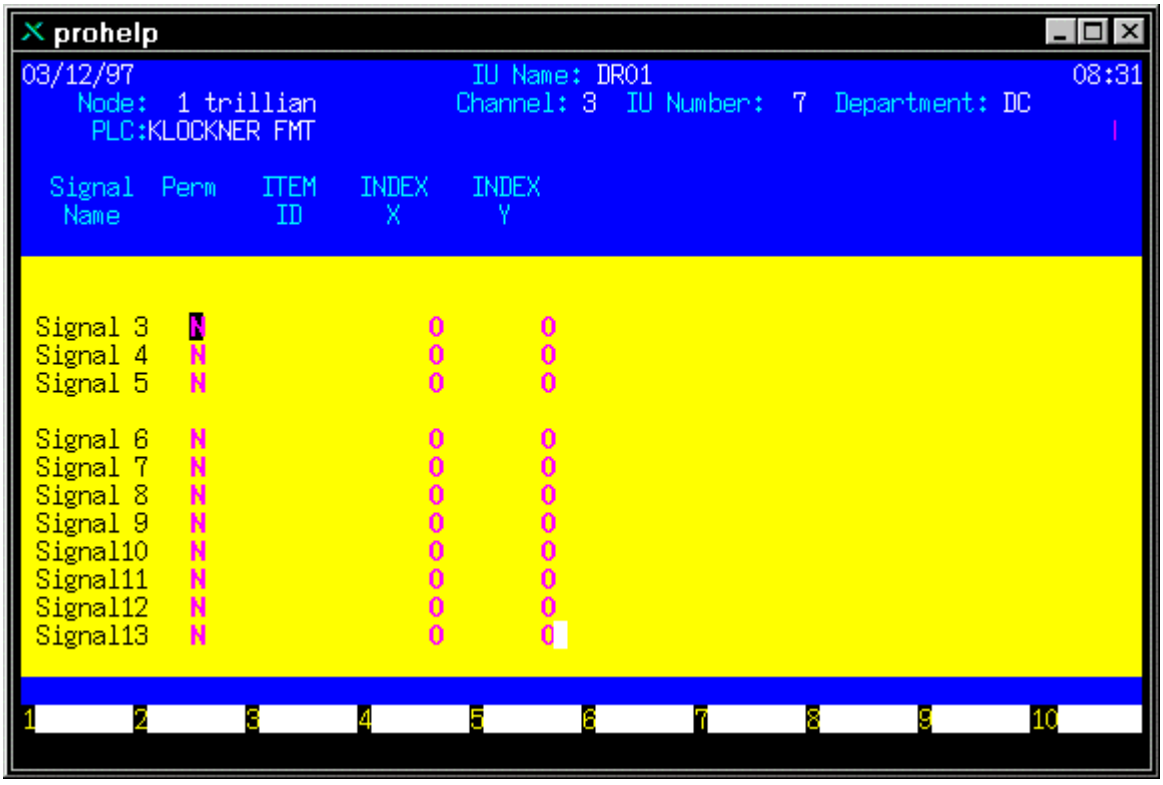

Figure 3-1 Klöckner FMT PLC Definition Page

Three items of information need to be entered via the PLC Definition page to monitor data items in the Klöckner controller.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"ITEM ID"*, *"INDEX X"*, and *"INDEX Y"* fields can be determined from your Klöckner FMT documentation. For array values, the *"INDEX X"* and *"INDEX Y"* fields contain the dimensional array index for the variable arrays. (These fields should contain a 0 if the item is not included in an array).

To exit the screen, press: ***"ESC"***

3.19 Klöckner MPC-80

The Klöckner Ferromatik Desma MPC-80 host communications interface provides data interchange for many items within the controller. The ProHelp - Klöckner interface allows the user to monitor various machine temperatures, positions, pressures, and timers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

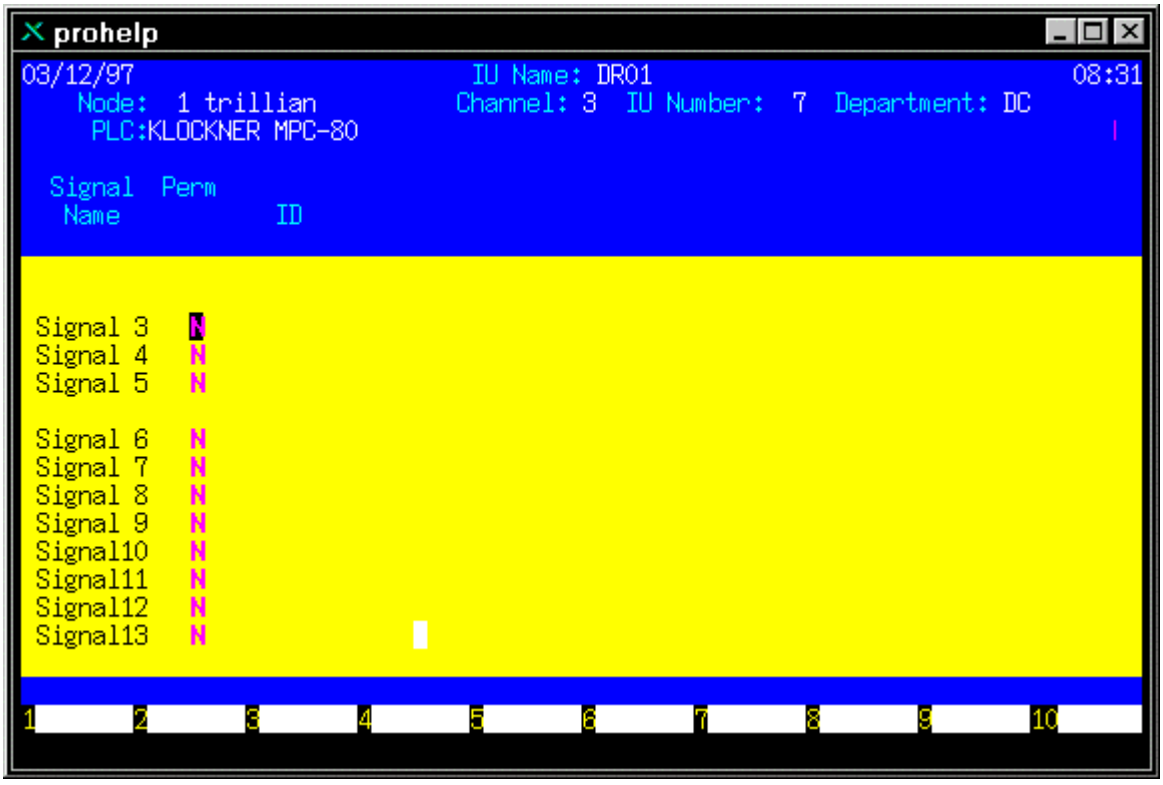

Figure 3-1 Klöckner MPC-80 PLC Definition Page

One item of information is needed to be entered via the PLC Definition page to monitor data items in the Klöckner MPC-80 controller.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"ITEM ID"* field can be determined from your Klöckner MPC-80 documentation.

To exit the screen, press: ***"ESC"***

NOTES:

1. All enabled *"ITEM IDs"* must be in one of the following formats:
   XXXXXX (single parameter)
   XXXXXX.XX (array value)
   XXXXXX.XX.XX (two dimensional array value)

   X = A letter or a number

2. Host communications use the only printer port available on the MPC-80.

3. Page 5 on the MPC-80 must be set to "*host*" for the port configuration.

3.20 Krauss Maffei

The Krauss Maffei host communications interface provides data interchange for many items within the control. The ProHelp - Krauss Maffei interface allows the user to monitor various registers the controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

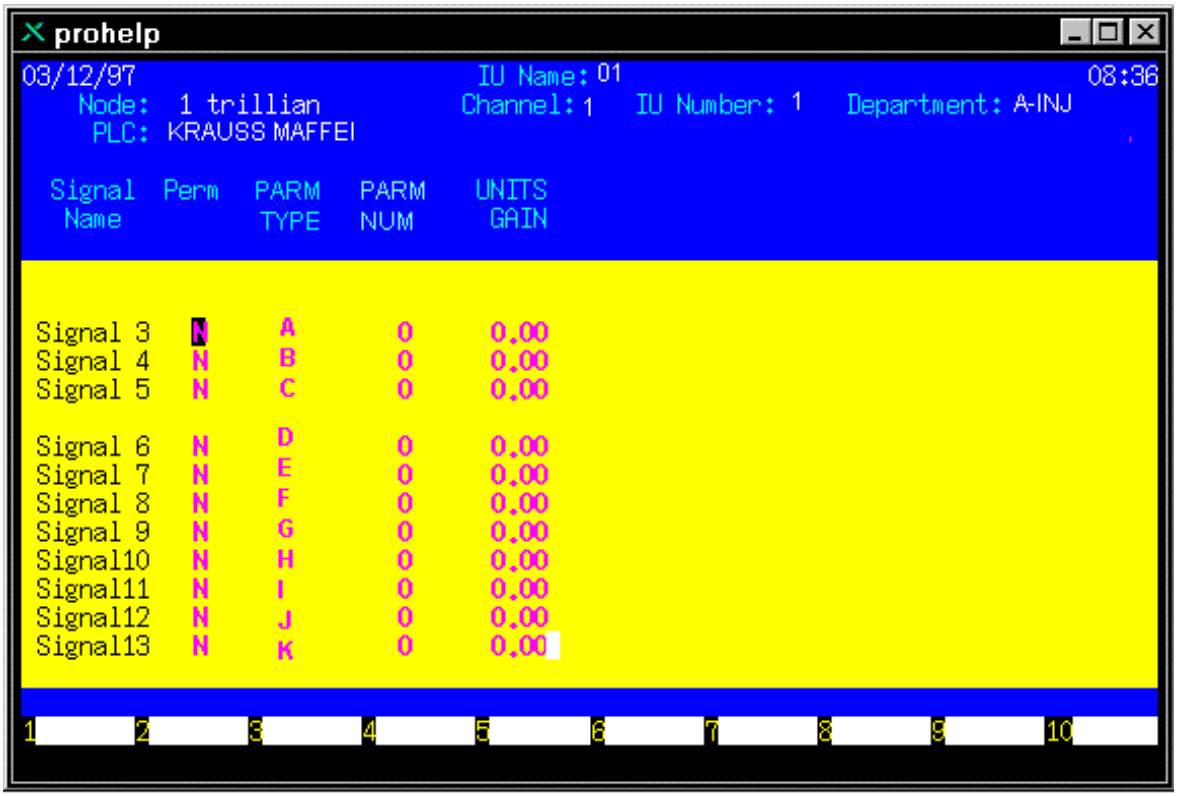

Figure 3-1 Krauss Maffei PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Three items of information need to be entered via the PLC Definition page to monitor data items in the Krauss Maffei PLC control. The Krauss Maffei PLC Definition page requires a *"PARM TYPE"*, *"PARM NUM"*, and *"UNITS GAIN"*.

To exit the screen, press: ***"ESC"***

3.21 MAC 90 PLC

The Mac 90 host communications interface provides data interchange for many items within the control. The ProHelp - Mac 90 interface allows the user to monitor various registers the controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Mac 90 PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Two items of information need to be entered via the PLC Definition page to monitor data items in the Mac 90 PLC control. The Mac 90 PLC Definition page requires a *"PARM NUM* and "*UNITS GAIN"*.

To exit the screen, press: ***"ESC"***

3.22 Maruka Toyo

The Maruka Toyo host communications interface provides data interchange for many items within the controller. The ProHelp - Maruka Toyo interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

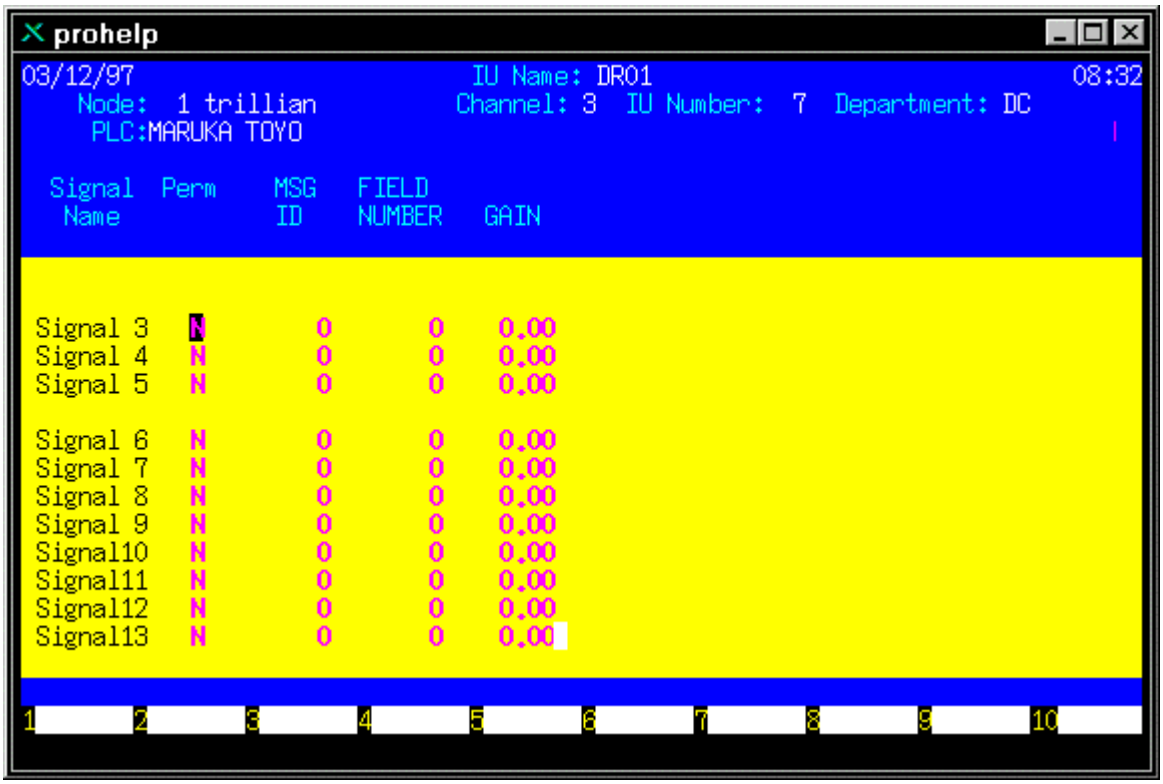

Figure 3-1 Maruka Toyo PLC Definition Page

Two items of information need to be entered via the PLC Definition page to monitor data items in the Maruka Toyo controller.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"MSG ID"* and *"FIELD NUMBER"* fields can be determined from the "MONITOR DATA TABLE" located in the Maruka Toyo documentation (HEATER 1 = Field Number 8, Heater 2 = Field Number 9, etc.). "*MSG ID"* must contain either a 3 (monitor 1 data) or a 4 (monitor 2 data). Any other number in the *"MSG ID"* field will cause the MIU to supply a field value of -32767 and will increment the PLC error counter 943.

To exit the screen, press: ***"ESC"***

NOTES:

1. For communications to operate, the PLC printer mode must be turned on at the Maruka Toyo PLC via the control panel.

2. The PLC baud rate should be set to 4800. This is accomplished by setting PLC DPSW 4 on the edge of the PLC MPU board, switch 5 OFF and switch 6 ON.

3.23 Mitsubishi MAC-VI

The Mitsubishi MAC-VI host communications interface provides data interchange for many items within the control. The ProHelp - Mitsubishi MAC-VI interface allows the user to monitor various registers within Mitsubishi MAC-VI controllers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

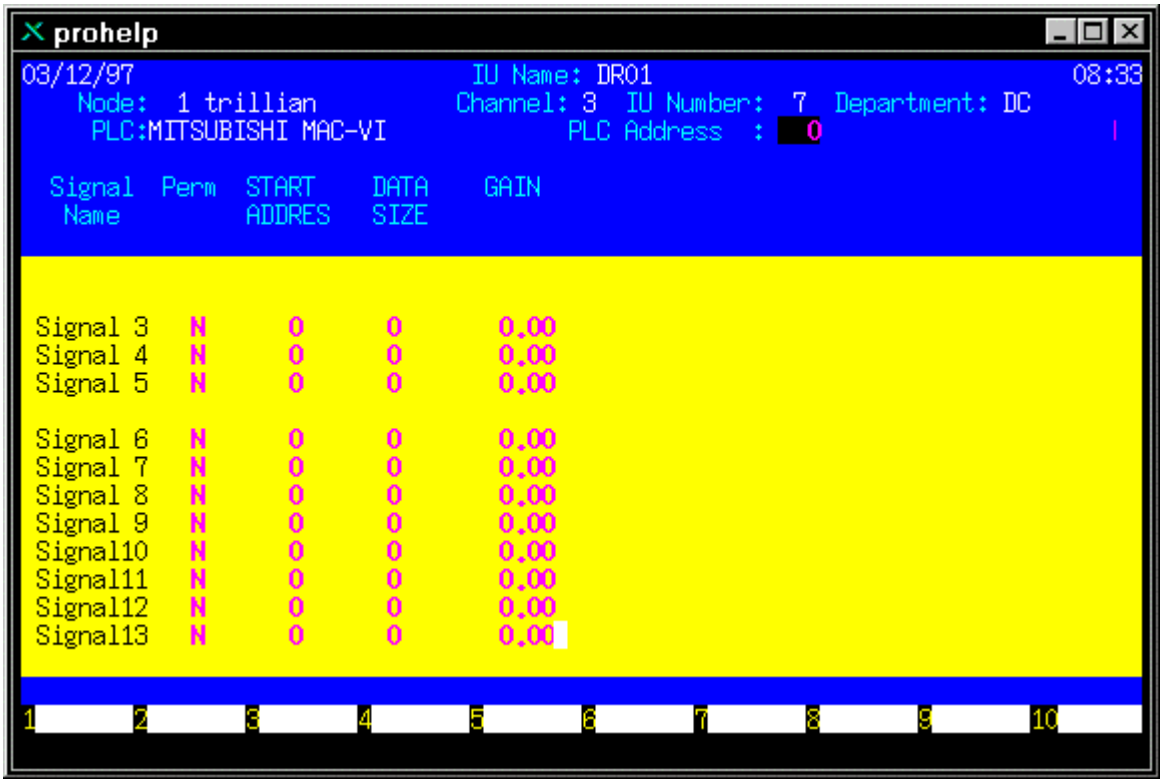

Figure 3-1 Mitsubishi MAC-VI PLC Definition Page

To exit the screen, press: ***"ESC"***

3.24 Moog Mopac 22MP

The Moog MOPAC 22MP (Modicon Protocol) host communications interface provides data interchange for many items within the control. The ProHelp - MOPAC 22 interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Moog MOPAC 22MP PLC Definition Page

Three items of information need to be entered via the PLC Definition page to monitor data items in the MOPAC 22MP control.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"HV"* and *"LV"* fields can be determined from your Moog MOPAC 22MP documentation *("COMMUNICATING WITH THE MOPAC 22")*. The *"GAIN"* field is for scaling the Pulse values in the ProHelp system (i.e. to remove the automatic one place decimal, place a 10 in the *"GAIN"* column. If no gain is required, place a 1 in the column).

To exit the screen, press: ***"ESC"***

3.25 Moog Mopac 22

The Moog MOPAC 22 host communications interface provides data interchange for many items within the control. The ProHelp - MOPAC 22 interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

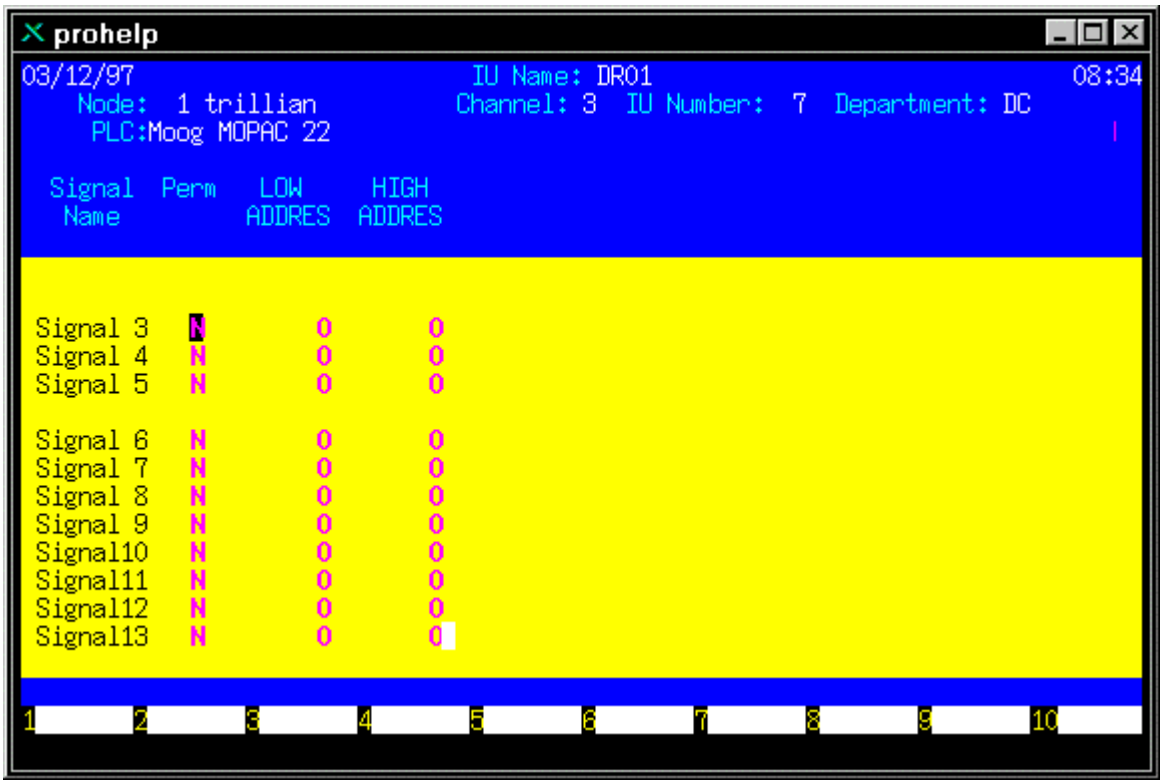

Figure 3-1 Moog MOPAC 22 PLC Definition Page

Three items of information need to be entered via the PLC Definition page to monitor data items in the MOPAC 22 control.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"LOW ADDRES"* and *"HIGH ADDRES"* fields can be determined from your Moog MOPAC 22 documentation.

To exit the screen, press: ***"ESC"***

3.26 Netstall

The Netstall host communications interface provides data interchange for many items within the control. The ProHelp - Netstall interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

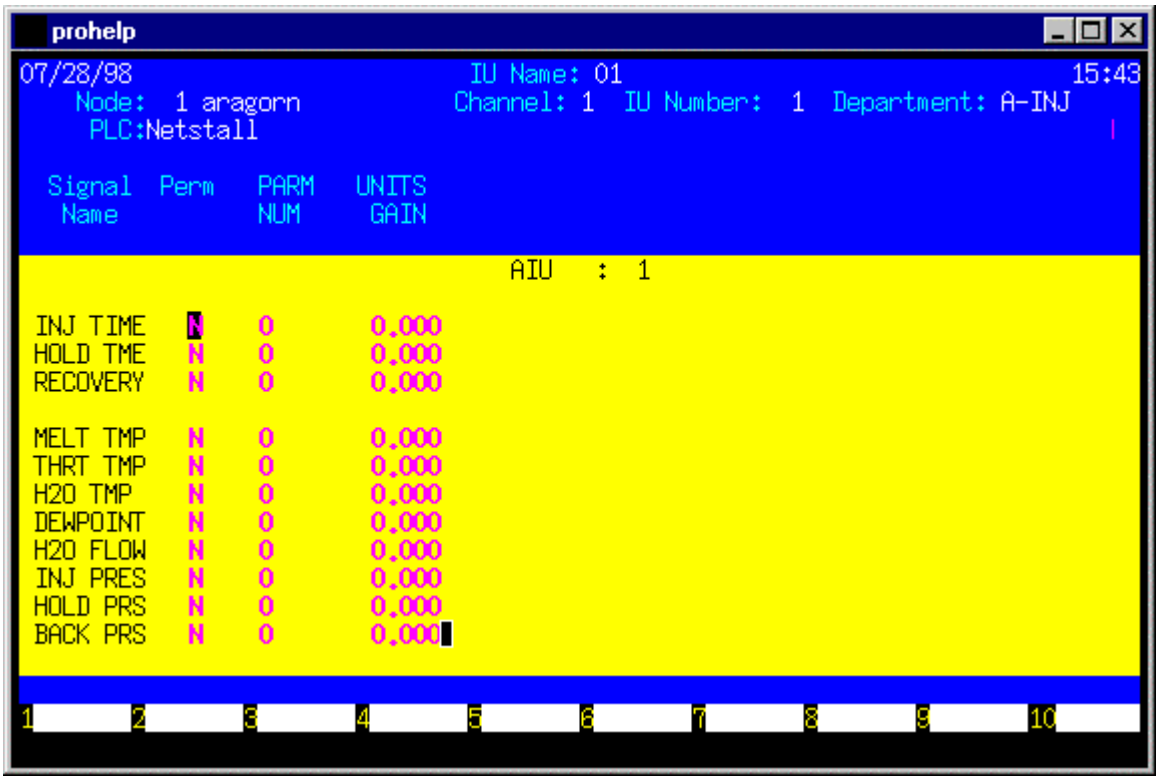

Figure 3-1 Netstall PLC Definition Screen

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"PARM NUM"* and *"UNITS GAIN"* fields can be determined from your Netstall documentation.

To exit the screen, press: ***"ESC"***

NOTE:
PI Manufacturing Parallel/Serial Converter

Parallel/Serial Converter Framing

4800 Baud
1 Stop
8 Data
No-parity

Parallel/Serial Converter Switch Settings

1,2 On
3-8 Off

3.27 Nissei - 9000G, 8300F and 9300T

The Nissei host communications interface provides data interchange for many items within the controller. The ProHelp - Nissei 9000G, 8300F, and 9300T interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Nissei PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type a '*Y*' to enable a signal to be monitored. Three items of information need to be entered via the PLC Definition page to monitor data items in the Nissei controller: a PLC address, *"ITEM NUMBER"*, and *"GAIN"*.

To exit the screen, press: ***"ESC"***

NOTE:

1. The "PLC Address" field contains the address of the PLC that is sent to the MIU. It can be determined from the switch settings on the PLC controller board.
2. Entries for the "*ITEM NUMBER*" field can be determined from the "Molding Condition Save" table in *Section 5-2* of your *Nissei NC8300 FT-10 Communication spec.*

3. The "*GAIN*" entry is for scaling the pulse values in the ProHelp system. For example, to remove the automatic one place decimal, place a 10 in the "*GAIN*" column. If no gain is required, place a 1 in the column.

See table below.

0.01	Divide by 100
0.10	Divide by 10
1.00	Normal
10.00	Multiply by 10
100.00	Multiply by 100

Switch Settings

The following settings apply to the Nissei 9000G (25 Pin D sub connector):

Dip 1	1	OFF	**Dip 2**	1	ON
	2	OFF		2	OFF
	3	OFF		3	OFF
	4	OFF		4	OFF
	5	OFF		5	OFF
	6	OFF		6	OFF
	7	OFF		7	OFF
	8	ON		8	OFF

- Switch selection definition:
- **Baud Rate** = 4800
- **Host Slave Address** = 1

The following settings apply to the Nissei 9000G (9 Pin D sub connector):

- Software switches are on the LCD Screen of the Control
- **Baud Rate** = 4800
- **Host Slave Address** = 1

The following settings apply to the Nissei 8300F (FT-10):

Dip 1	1	OFF	**Dip 2**	1	ON
	2	OFF		2	OFF
	3	OFF		3	OFF
	4	OFF		4	OFF
	5	OFF		5	OFF
	6	OFF		6	OFF
	7	OFF		7	OFF
	8	ON		8	OFF

- Switch selection definition:
- **Baud Rate** = 4800
- **Host Slave Address** = 1

The following settings apply to the Nissei 9300T:
The MIU is the Master and will initiate communications.

- MIU Poll Request → [EOT] [Mach address] ['tx'] [ENQ] [BCC]
- Nissei 9300 Response ← [ACK]
- Nissei 9300 Response ← [STX] ['HO'] [Data] [ETX] [BCC]
- MIU Response ← [ACK]

MACHINE SETUP NOTES:

1. Hit the *Compile* key on controller screen panel. Change baud rate on screen to the above framing.
2. Find the PC board mounted on the controller door behind the front panel screen. Look for DIP 1 underneath the bottom of board. Put switch #4 of DIP 1 in the ON position. Next, cycle the power of machine.
3. After machine has re-powered, hit the *Shift* key and the *Main Data* key at the same time. Look for the word "NC-NET" on the screen. Touch the word to toggle it on or off. Make sure it is ON. Set DIP 1 switch #4 OFF and recycle the machine.

NOTE:

Nissei requires isolation between their 9 pin and the outside world for warranty purposes. They suggest a Telebyte RS-232 Isolation DB25 - DB25, Model #282, Phone 1-800-835-3298.

3.28 Nissei 8000

The Nissei 8000 host communications interface provides data interchange for many items within the controller. The ProHelp - Nissei 8000 interface allows the user to monitor various machine temperatures, positions, pressures, and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

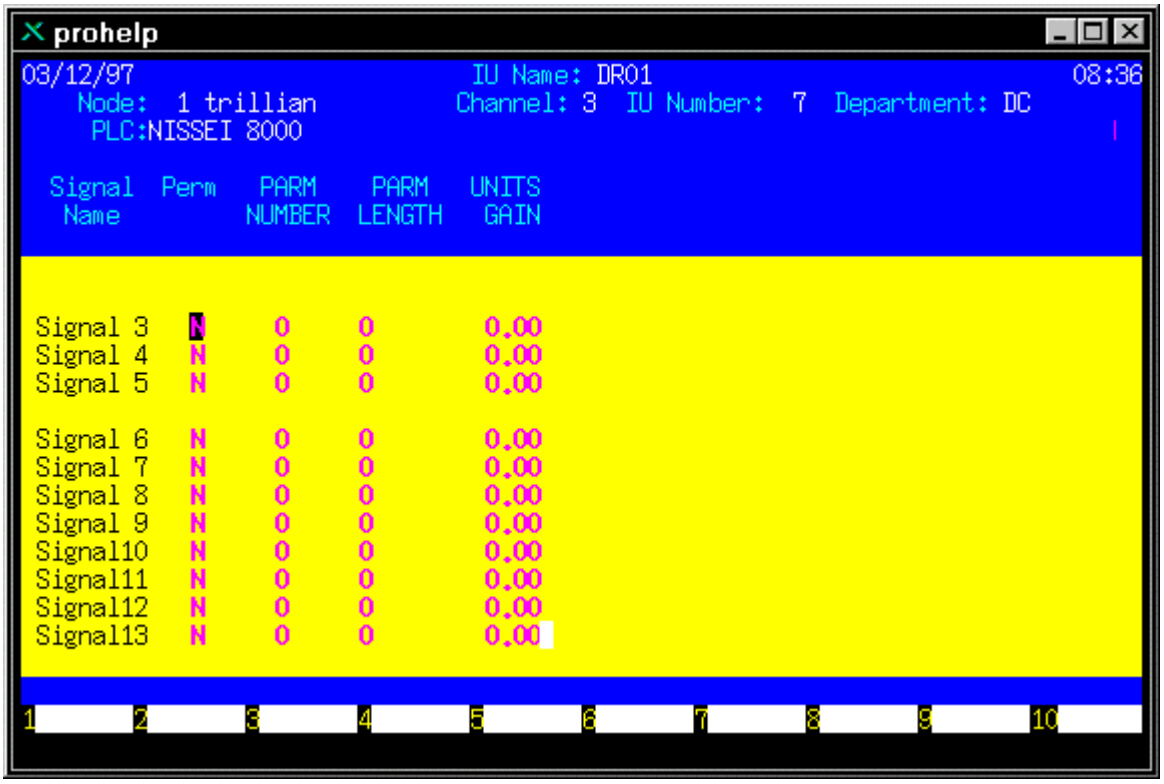

Figure 3-1 Nissei 8000 PLC Definition Page

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type a '*Y*' to enable a signal to be monitored. Three items of information need to be entered via the PLC Definition page to monitor data items in the Nissei controller: a PLC address, *"PARM NUMBER"*, "PARM LENGTH" and *"UNITS GAIN"*.

To exit the screen, press: ***"ESC"***

Switch Settings

The following apply to the Nissei 8000:

Baud Dip			**Func Dip**			**Addr Dip**		
	1	OFF		1	ON		1	OFF
	2	OFF		2	OFF		2	OFF
	3	OFF		3	OFF		3	OFF
	4	OFF		4	OFF		4	OFF
	5	OFF		5	OFF		5	OFF
	6	OFF		6	OFF		6	OFF
	7	ON		7	ON		7	OFF
	8	OFF		8	OFF		8	ON

Host Slave Address = 1

3.29 SCI Scoremaster

The SCI Scoremaster host communications interface provides data interchange for many items within the control. The ProHelp - Scoremaster interface allows the user to monitor various machine temperatures, positions, pressures, and timers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

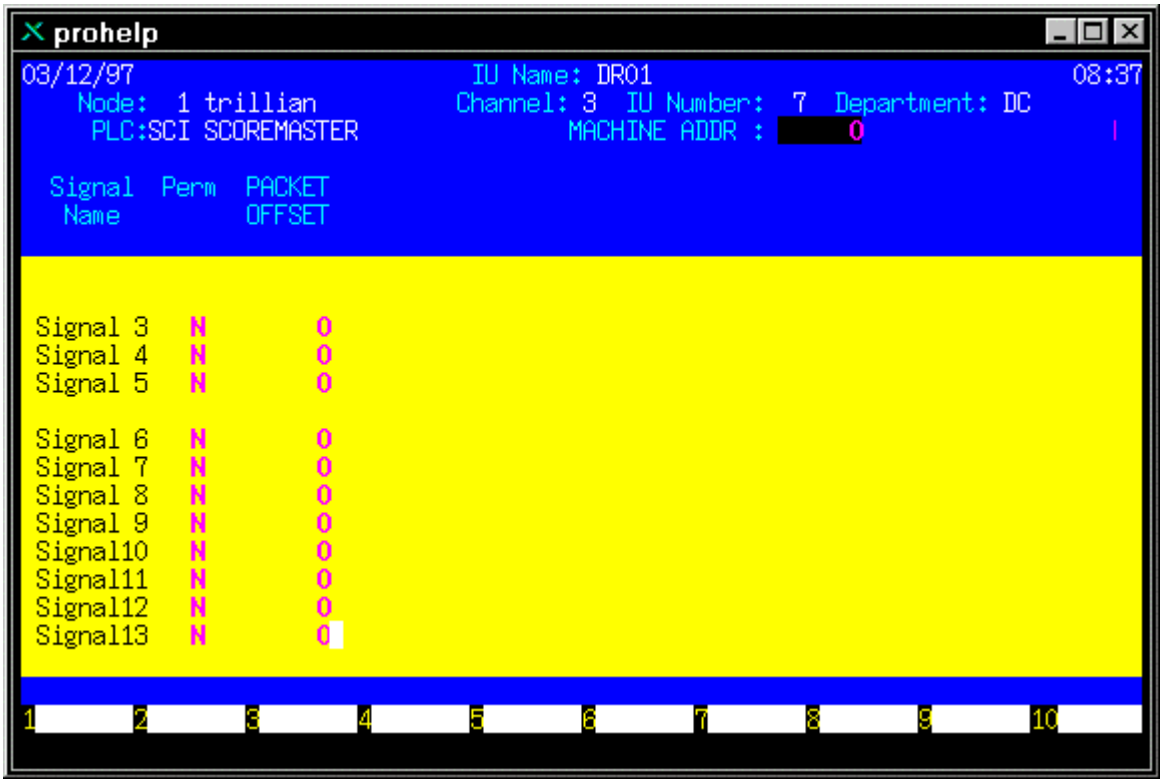

Figure 3-1 SCI Scoremaster PLC Definition Page

To exit the screen, press: ***"ESC"***

NOTE:

1. Valid machine addresses range from 225 to 255.

2. The following parameters can be monitored:

Name	Bytes	Format	Units	Packet Offset
cyctim	2	xx.xx	seconds	0
filltim	2	xx.xx	seconds	2
rectim	2	xx.xx	seconds	4
opentim	2	xx.xx	seconds	6
tottim	4	xx.xx	seconds	8
corrss	4	x.xxx	inches	12
cushion	2	x.xxx	inches	16
hydtfr	2	xxxxx	psi	18

3.30 Siemens AS511

The Siemens AS511 host communications interface provides data interchange for many items within the controller. The ProHelp - AS511 interface allows the user to monitor various machine temperatures, positions, pressures, and timers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

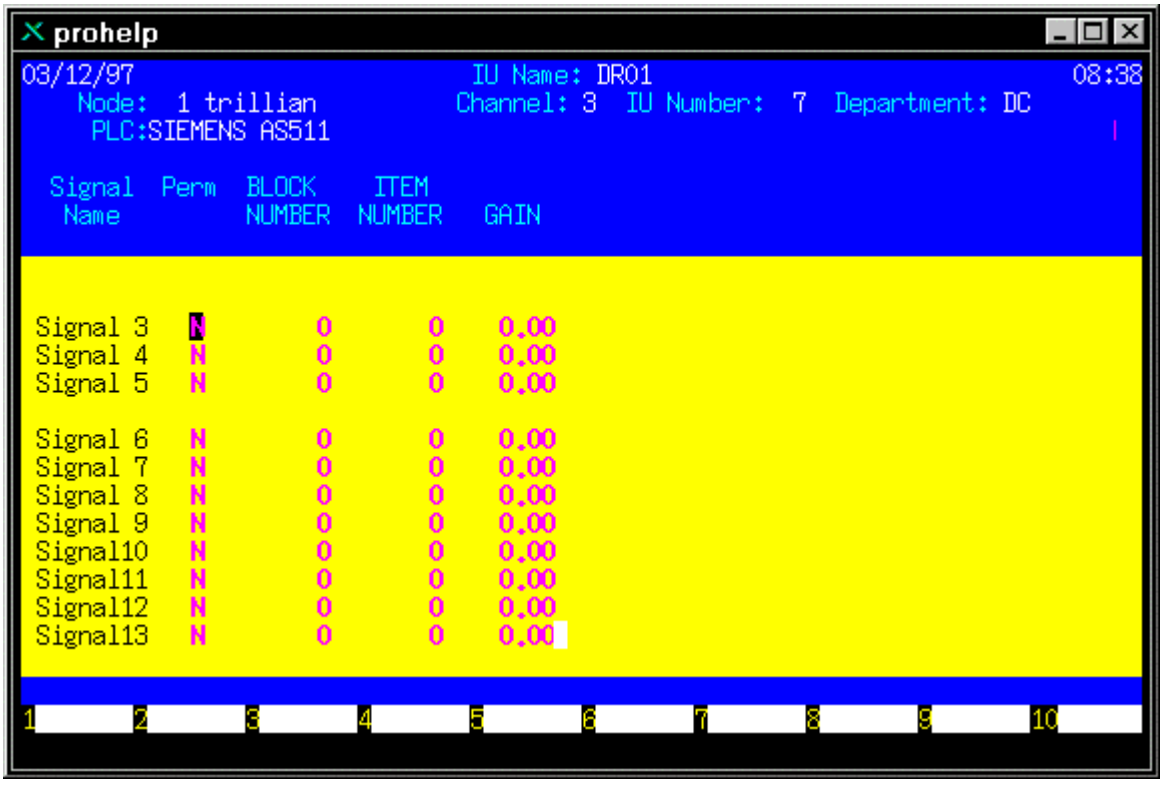

Figure 3-1 Siemens AS511 PLC Definition Page

Three items of information need to be entered via the PLC Definition page to monitor data items in the AS511 controller.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"BLOCK NUMBER"* and *"ITEM NUMBER"* fields can be determined from the manufacturers documentation. The *"GAIN"* field is for scaling the Pulse values in the ProHelp system (i.e. to remove the automatic one place decimal, place a 10 in the "*GAIN"* column. If no gain is required, place a 1 in the column).

To exit the screen, press: ***"ESC"***

3.31 Siemens Demag

The Siemens DEMAG host communications interface provides data interchange for many items within the controller. The ProHelp - DEMAG interface allows the user to monitor various machine temperatures, positions, pressures, and timers. ***Before continuing, please refer to Section 2 "Special Requirements/Restrictions".***

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

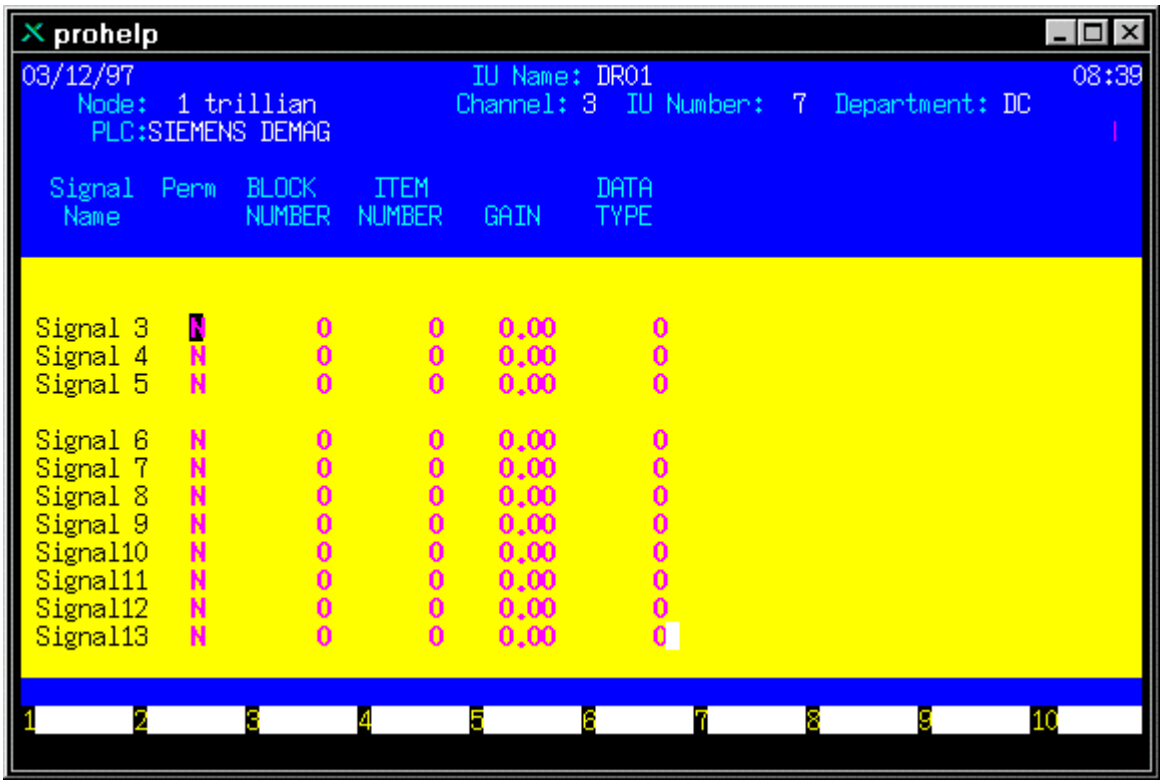

Figure 3-1 Siemens DEMAG PLC Definition Page

Four items of information need to be entered via the PLC Definition page to monitor data items in the DEMAG controller.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored. Entries for the *"BLOCK NUMBER"* and *"ITEM NUMBER"* fields can be determined from your Siemens DEMAG documentation. The *"DATA TYPE"* field must contain one of the following:

0 = Display as is (normal)
1 = BCD Data (usually positions)
2 = Floating Point (usually timers)

The *"GAIN"* column must contain one of the following:

0.01 (Divide by 100)
0.10 (Divide by 10)
1.00 (Normal)
10.00 (Multiply by 10)
100.00 (Multiply by 100)

To exit the screen, press: ***"ESC"***

3.32 Siemens 944

The Siemens 944 host communication interface provides data interchange for many items within the controller. The ProHelp Siemens 944 interface allows the user to monitor various machine temperatures, pressures, positions, and times.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

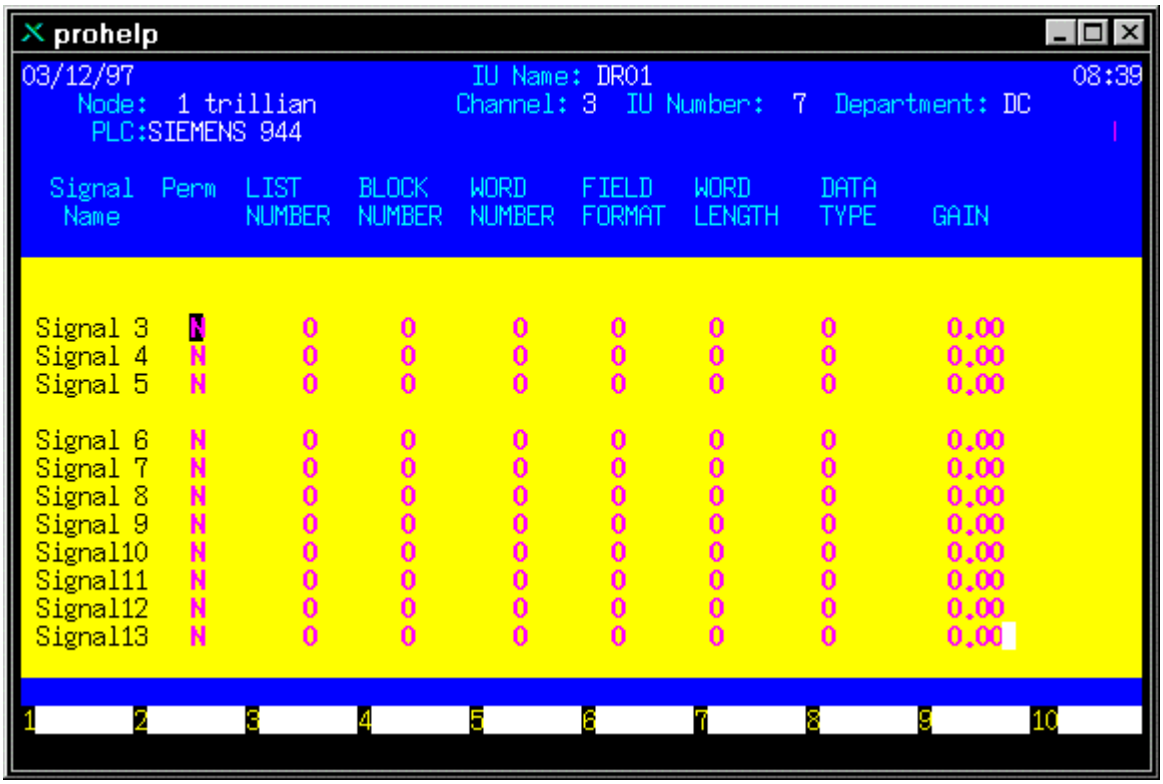

Figure 3-1 Siemens 944 PLC Definition Page

Seven items of information need to be entered via the PLC Definition page to monitor data items in Siemens 944 control.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal monitoring. The entries for *"LIST NUMBER"*, *"BLOCK NUMBER"*, *"WORD NUMBER"*, *"FORMAT"*, *"LENGTH"*, and *"TYPE"* can be determined from your Siemens CPU944 documentation.

To exit the screen, press: ***"ESC"***

NOTES:

1. If *"LIST NUMBER", "BLOCK NUMBER", or "WORD NUMBER"* is changed while the Siemens 944 is still running, the correct data will not be displayed until the next machine cycle.
2. If the signal being monitored is an OP, operator panel signal, then zeros must be entered for *"BLOCK NUMBER"* and *"WORD NUMBER"*. DO NOT use negatives.
3. If there are problems retrieving the requested signals, check the general PLC errors at the MIU Service Display

3.33 Toshiba EX100

The Toshiba EX100 host communications interface provides data interchange for many items within the controller. The ProHelp - Toshiba interface allows the user to monitor various machine temperatures, positions, pressures and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

Figure 3-1 Toshiba EX100 PLC Definition Page

Two pieces of information are needed for each item that will be monitored - the *"DEVICE/REGISTER"* number and the *"GAIN"*.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type a *'Y'* to enable a signal to be monitored.

The following items are key points in making the Toshiba-MIU interface operate correctly:

1 The baud rate on the EX100 should be configured for 4800 (no partity).
2 The Slave Address must correspond to the Station number of the EX100.
3 The PROGMR-LINK switch must be in the LINK position on the EX100.
NOTE: changes to any of the switches on the EX100 are not valid until power is cycled.
4 Jumper J-9 on the MIU must be OFF.

3.34 Toshiba V10

The Toshiba V10 host communications interface provides data interchange for many items within the controller. The ProHelp - Toshiba interface allows the user to monitor various machine temperatures, positions, pressures and timers.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

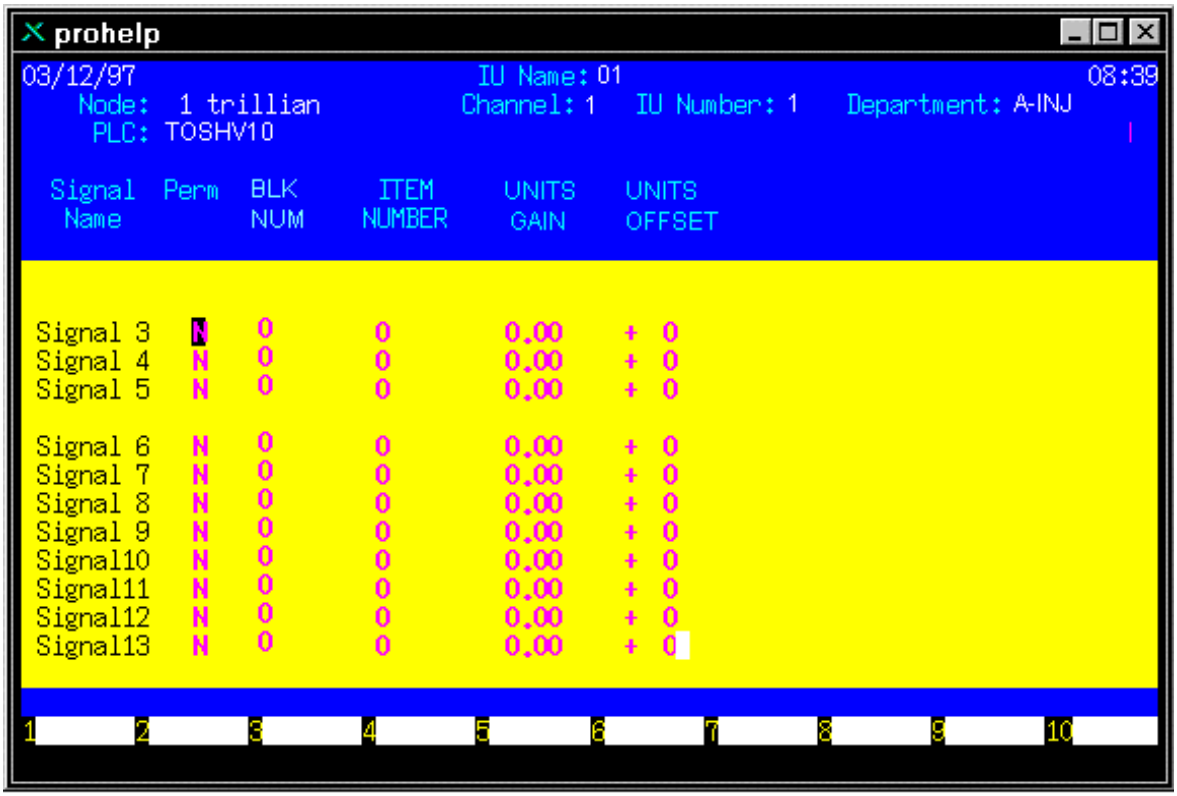

Figure 3-1 Toshiba V10 PLC Definition Page

To exit the screen, press: ***"ESC"***

3.35 VanDorn CRT-C

The VanDorn CRT-C host communications interface provides data interchange for many items within the control. The ProHelp - to - CRT-C interface allows the user to monitor the following types of data from the CRT-C control:

1) Single Setpoint values
2) Single System values
3) Process Monitor Data
4) Peripheral Device Actual Data

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing *"F7 - PLC"*. Place the cursor on the "*PLC*" field.

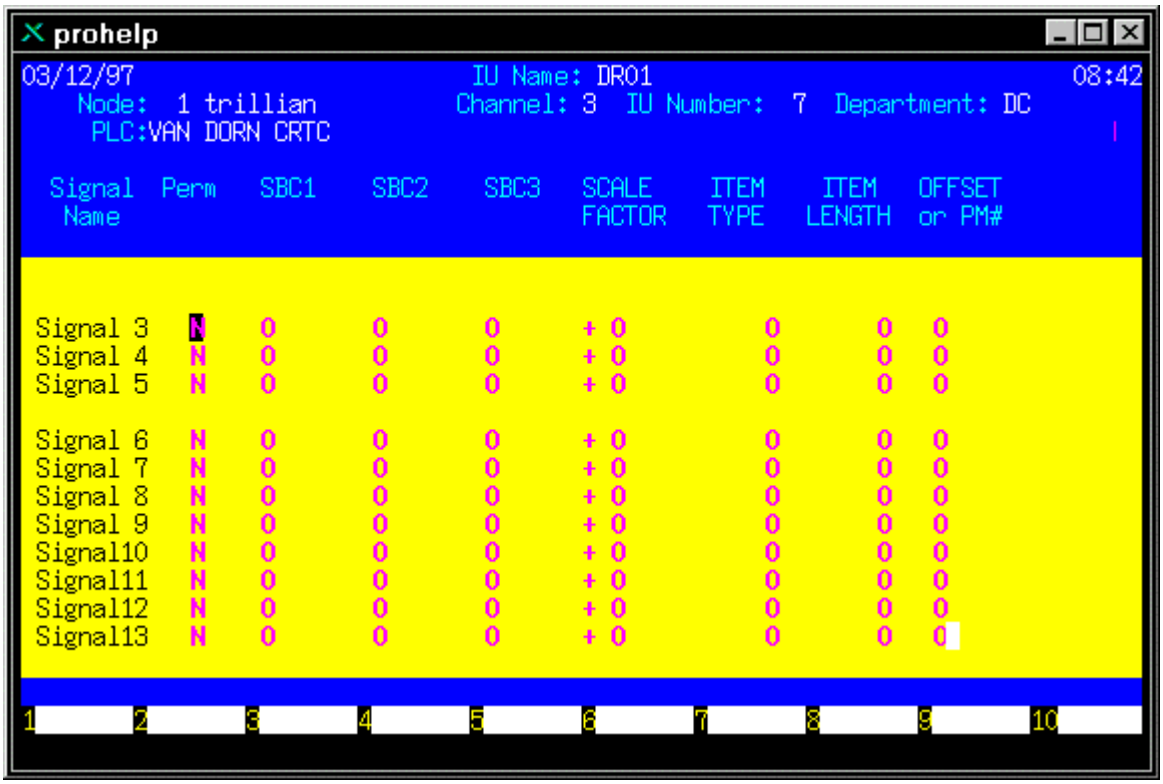

Figure 3-1 VanDorn CRT-C PLC Definition Page

Several pieces of information need to be entered via the PLC Definition page to monitor data items. Most of this information is found in the VanDorn documentation shipped to the user.

All data items to be monitored MUST be enabled in the *"Perm"* field of the PLC Definition page. Type in a *'Y'* to enable a signal to be monitored.

To exit the screen, press: ***"ESC"***

3.35.1 Single Setpoint Values

For Single Setpoint items, the following additional fields require user information: *"SBC1", "SBC2", "SBC3", "SCALE FACTOR", "ITEM TYPE", "ITEM LENGTH"*, and *"OFFSET or PM#"*, where:

SBC1 is always a 21.

SBC2 and ***SBC3*** are listed in the Single Setpoint description for each item in the VanDorn CRT-C Host Communication Specification.

SCALE FACTOR is determined by the number of decimal places specified by the user via the MIU Definition page (display precision), and the actual number of decimal places that the data item is represented, internal to the interface (actual precision). This information can be found in the description for each data item (in the "Units" explanation) in the VanDorn CRT-C Host Communication Specification.

NOTE: *SCALE FACTOR* only applies to binary data types.

Display precision is fixed for "Pulse 2", "Pulse 3", and "Pulse 4". Up to four (4) decimal places may be displayed for the "Analog" signals; see Section 1 of this document.

Actual precision is determined from the divisor of the RV (raw value) for a particular data item. For example, the actual precision of the Process Control Position Cut-off Setpoint Value data item is three (3) decimal places (RV / 1000 implies 3 decimal places). The actual precision for an item in the Process Control Holding Pressure Profile Time Setpoint Array is two (2)decimal places (RV / 100 implies 2 decimal places).

NOTE: Any data item without a divisor for the raw value implies an actual precision of zero decimal places.

Thus, the *SCALE FACTOR* for any given data item is calculated from the following equation:

SCALE FACTOR = (display precision) - (actual precision)

For example, the *SCALE FACTOR* for any item in the Process Control Holding Pressure Profile Time Setpoint Array, with a display precision set for two (2) decimal places, is 0 (2 - 2 = 0). The *SCALE FACTOR* for any item in the Process Control Velocity Profile Position Set Point Array, with a display precision set for one (1) decimal place, is 1 (1 - 0 = 1).

ITEM TYPE is determined from the "Format" listed in the Single Setpoint Data description for each item in the VanDorn CRT-C Host Communication Specification, where:

BIN = 1
FLOATING POINT = 2
ASCII = 3

ITEM LENGTH is determined from the "Length" listed in the Single Setpoint Data description for each item, except when the item is communicated in an array of values.
In these cases, the length is considered to be the length of a single item in the array.

OFFSET or PM# for those Single Setpoints which are communicated as single items is always 0.

For those Single Setpoints which are communicated in an array of values, the *OFFSET* is determined from the Setpoint Data description for each item in the VanDorn CRT-C Host Communication Specification and using the following formula:

(SPN - 1) * Item Length = FBN

where:

SPN = the Setpoint item in the array to be monitored
Item Length = the length of an item in the array
FBN = the *OFFSET* to be entered in the *"OFFSET or PM#"* field.

For example, to monitor the third item in the Process Control Velocity Profile Position Setpoint Array with a display precision of zero decimal places, the following information should be entered via the PLC Definition page:

Signal Name	***Perm***	***SBC1***	***SBC2***	***SBC3***	***Scale Factor***	***Item Type***	***Item Length***	***Offset or PM#***
Analog 2	Y	21	21	2B	0	1	2	4

To monitor the Process Control Cushion Setpoint Value with a display precision of two decimal places, the following information should be entered via the PLC Definition page:

Signal Name	***Perm***	***SBC1***	***SBC2***	***SBC3***	***Scale Factor***	***Item Type***	***Item Length***	***Offset or PM#***
Analog 2	Y	21	21	31	-1	1	2	0

3.35.2 Single System Values

For Single System items, the following additional fields require user information: *"SBC1"*, *"SBC2"*, *"SBC3"*, *"SCALE FACTOR"*, *"ITEM TYPE"*, *"ITEM LENGTH"*, and *"OFFSET or PM#"*, where:

SBC1 for Single System is always a 23.

SBC2 and ***SBC3*** are listed in the System Data description for each item in the VanDorn CRT-C Host Communication Specification.

SCALE FACTOR is determined as follows:

SCALE FACTOR = (display precision) - (actual precision)

NOTE: *SCALE FACTOR* only applies to binary data types.

ITEM TYPE is determined from the "Format" listed in the System Data description for each item in the VanDorn CRT-C Host Communication Specification, where:

BIN = 1
FLOATING POINT = 2
ASCII = 3

ITEM LENGTH is determined from the "Length" listed in the System Data description for each item, except when the system data is communicated in an array of values. In these cases, the length is considered to be the length of a single item in the array.

OFFSET or PM# for those System Data items which are communicated as single items is always 0.

For those System Data items which are communicated in an array of values, the *OFFSET* is determined from the System Data description for each item in the VanDorn CRT-C Host Communication Specification and using the following formula:

(SPN - 1) * Item Length = FBN

where:

SPN = the Setpoint item in the array to be monitored.
Item Length = the length of an item in the array.
FBN = the *OFFSET* to be entered in the *"OFFSET or PM#"* field.

For example, to monitor the fourth item in the Mold Changer Sequence Array with a display precision set to zero decimal places, the following information should be entered via the PLC Definition page:

Signal Name	***Perm***	***SBC1***	***SBC2***	***SBC3***	***Scale Factor***	***Item Type***	***Item Length***	***Offset or PM#***
Analog 3	Y	23	26	27	0	1	1	3

To monitor the Current Parts Requested Value with a display precision set to zero decimal places, the following information should be entered via the PLC Definition page:

Signal Name	***Perm***	***SBC1***	***SBC2***	***SBC3***	***Scale Factor***	***Item Type***	***Item Length***	***Offset or PM#***
Analog 3	Y	23	26	25	0	1	4	0

3.35.3 Peripheral Device Actual Data

For Peripheral Device Actual Data items, the following additional fields require user information: *"SBC1", "SBC2", "SBC3", "SCALE FACTOR", "ITEM TYPE", "ITEM LENGTH"*, and *"OFFSET or PM#"*, where:

SBC1 for Peripheral Device Data is always a 27 for VDOI software levels 1 through 19.
SBC1 for Peripheral Device Data is always a 28 for VDOI software levels 20 and above.

SBC2 is always a 31 for VDOI software levels 1 through 19.
SBC2 is always a 23 for VDOI software levels 20 and above.

NOTE: Refer to your VanDorn representative for information on the VDOI software levels.

SBC3 is determined from the following tables:

For VDOI Software levels 1 through 19:

SBC3	Description
21	Peripheral Device # 1 Actual Array
22	Peripheral Device # 2 Actual Array
23	Peripheral Device # 3 Actual Array
24	Peripheral Device # 4 Actual Array
25	Peripheral Device # 5 Actual Array
26	Peripheral Device # 6 Actual Array
27	Peripheral Device # 7 Actual Array
28	Peripheral Device # 8 Actual Array
29	Peripheral Device # 9 Actual Array

For VDOI Software levels 20 and above:

SBC3	Description
21	Device # 1 Volatile Memory Array
22	Device # 2 Volatile Memory Array
23	Device # 3 Volatile Memory Array
24	Device # 4 Volatile Memory Array
25	Device # 5 Volatile Memory Array
26	Device # 6 Volatile Memory Array
27	Device # 7 Volatile Memory Array
28	Device # 8 Volatile Memory Array
29	Device # 9 Volatile Memory Array
2A	Device # 10 Volatile Memory Array
2B	Device # 11 Volatile Memory Array
2C	Device # 12 Volatile Memory Array
2D	Device # 13 Volatile Memory Array
2E	Device # 14 Volatile Memory Array
2F	Device # 15 Volatile Memory Array
30	Device # 16 Volatile Memory Array

SCALE FACTOR is determined as follows:

SCALE FACTOR = (display precision) - (actual precision)

NOTE: *SCALE FACTOR* only applies to binary data types.

ITEM TYPE is determined from the Peripheral Device descriptions in the VanDorn CRT-C Host Communication Specification.

ITEM LENGTH is determined from the Peripheral Device descriptions in the VanDorn CRT-C Host Communication Specification.

OFFSET or PM# is determined from the Peripheral Device descriptions in the VanDorn CRT-C Host Communication Specification.
For example, to monitor the High Alarm Setpoint Absolute String for an AEC Dryer (VDOI Software levels 1 through 19), with a display precision set to two decimal places, the following information should be entered via the PLC Definition page:

Signal Name	*Perm*	*SBC1*	*SBC2*	*SBC3*	*Scale Factor*	*Item Type*	*Item Length*	*Offset or PM#*
Analog 3	Y	27	31	21	2	3	3	7

To monitor the Zone A Process Temp Setpoint for a DME Hot Runner System (VDOI Software levels 20 and above) with a display precision set to one decimal place, the following information should be entered:

Signal Name	*Perm*	*SBC1*	*SBC2*	*SBC3*	*Scale Factor*	*Item Type*	*Item Length*	*Offset or PM#*
Analog 4	Y	28	23	23	1	1	2	6

3.35.4 Process Monitor Data

Process Monitor Data items only require information in the *"SBC1", "SCALE FACTOR"*, and *"OFFSET or PM#"* fields, where:

SBC1 is always a 25.

SBC2 is not used.

SBC3 is not used.

SCALE FACTOR is determined as follows:

SCALE FACTOR = (display precision) - (actual precision)

NOTE: *SCALE FACTOR* only applies to binary data types.

ITEM TYPE is not used.

ITEM LENGTH is not used.

OFFSET or PM# is obtained from the following table:

Data item to be monitored	**Offset or PM #**
Peak Die Cavity Pressure	1
Actual Cushion Position	2
Velocity at Cutoff	3
Screw Position at Cutoff	4
Injection Pressure at Cutoff	5
Logic Processor Timer 1 - Cycle time	6
Logic Processor Timer 2 - Injection time	7
Logic Processor Timer 3 - Screw Rotate time	8
Logic Processor Timer 4 - Mold Close time	9
Logic Processor Timer 5 - Mold Open time	10
Logic Processor Timer 6 - Optional time	11
Temperature - Zone 1	12
Temperature - Zone 2	13
Temperature - Zone 3	14

Temperature - Zone 4	15
Temperature - Zone 5	16
Temperature - Zone 6	17
Temperature - Zone 7	18
Temperature - Zone 8	19

For example, to monitor Actual Cushion Position, with a display precision set to three decimal places, the following information should be entered via the PLC Definition page:

Signal Name	***Perm***	***SBC1***	***SBC2***	***SBC3***	***Scale Factor***	***Item Type***	***Item Length***	***Offset or PM#***
Analog 2	Y	25	0	0	3	0	0	2

To monitor Temperature - Zone 3, with a display precision set to zero, the following information should be entered via the PLC Definition page:

Signal Name	***Perm***	***SBC1***	***SBC2***	***SBC3***	***Scale Factor***	***Item Type***	***Item Length***	***Offset or PM#***
Analog 2	Y	25	0	0	0	0	0	14

3.36 VanDorn 4500

The VanDorn 4500 host communications interface provides data interchange for many items within the control. The ProHelp - to - VanDorn 4500 interface allows the user to monitor the following types of data.

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC"*. Place the cursor on the "*PLC*" field.

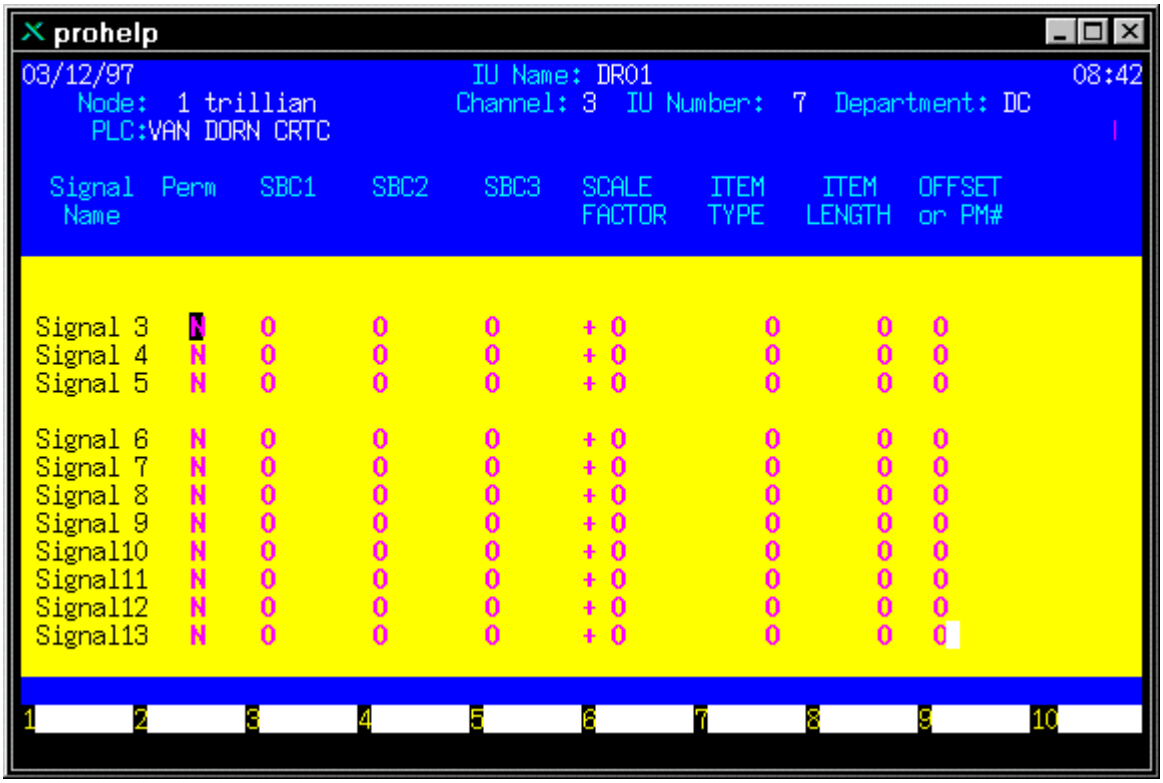

Figure 3-1 VanDorn 4500 PLC Definition Page

Several pieces of information need to be entered via the PLC Definition page to monitor data items. Most of this information is found in the VanDorn documentation shipped to the user.

VanDorn 4500 Descriptors

Device ID - This field descriptor is the device ID that the machine controller manufacturer sets on their machine. The device ID is a hexadecimal value.

Address - This field descriptor is the address that the SPI equipment is set at. This value is between 32 - 255.

Cmd1 - This field descriptor is the first byte listed next to the POLL descriptor of the process parameter that is selected to monitor. Cmd1 is a hexadecimal value and can be found in the SPI device specification.

Cmd2 - This field descriptor is the second byte listed next to the POLL descriptor of the process parameter that is selected to monitor. Cmd2 is also a hexadecimal value and can be found in the SPI device specification.

Temp Zone - This field descriptor is a temperature zone value between 1-8. A 0 must be placed in this field if a non-temperature parameter is selected.

Gain - This field descriptor is a value between 0.0 and 32.767 and will be multiplied by the value received from the controller. If a 0.0 is left in this field there will be no gain on the selected signal.

VanDorn 4500 PLC Screen Notes

1) Formats of the selected parameter can be Numeric or 8 - 4 Byte Numeric only. In the case of Numeric, a value of 0 must be entered in the Temp Zone descriptor. In the case of 8 - 4 Byte Numeric, a value between 1 - 8 must be entered in the Temp Zone descriptor representing 4 Byte Numeric floats 1 - 8.

2) If a selected parameter is not available through the VanDorn 4500 machine controller, a forced 0 will be placed in the signal value.

VanDorn 4500 PLC Screen Setup Example

VanDorn/SPI Document -

Barrel Temperature Zones 1 - 8 Present Value

Poll:	71-7F 20
Select:	
Format:	8 - 4 Byte Numeric
Units:	Degrees Fahrenheit
Required:	Yes

Peak Hydraulic Injection Pressure

Poll:	31-3F 82
Select:	
Format:	Numeric
Units:	PSI
Required:	No

To exit the screen, press: ***"ESC"***

3.37 Windsor Printer PLC

The Windsor Printer PLC host communications interface provides data interchange for many items within the control. The ProHelp Windsor Printer PLC interface allows the user

Once the MIU has been correctly configured, the user must select the particular data items to be monitored. This is done via the PLC Definition page. Select the page by pressing "*F7 - PLC*". Place the cursor on the "*PLC*" field.

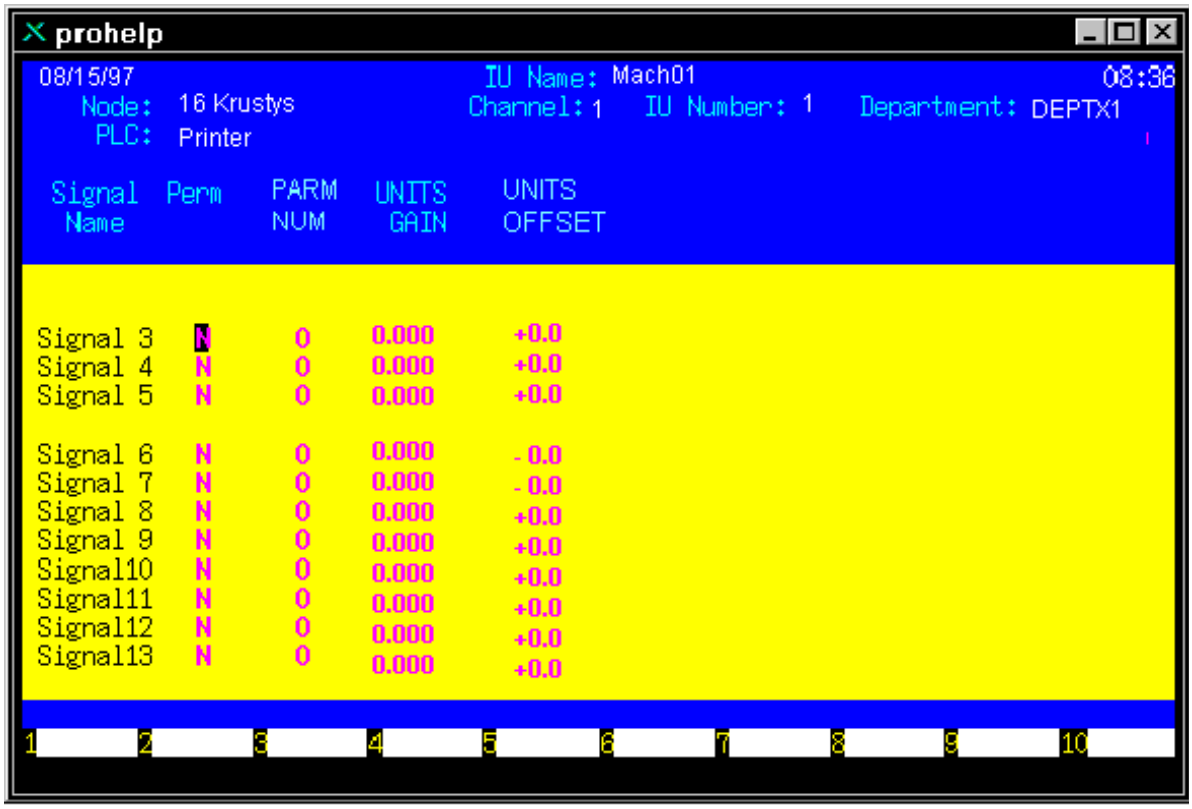

Figure 3-1 Windsor Printer PLC Definition Screen

All data items to be monitored MUST be enabled in the "*Perm*" field of the PLC definition page. Type in a 'Y' to enable a signal to be monitored. Four items of information need to be entered via the PLC Definition page to monitor data items in the Windsor Printer PLC control. The Windsor Printer PLC Definition page requires a *PLC address, "PARM NUM", "UNITS GAIN"* and *"UNITS OFFSET"*.

NOTES: Machine must be set to "auto print" every cycle. Parameters can be identified by the Process Monitoring Setting screen on the machine control panel or by the following printout example.

Printer Example:

PROCESS MONITORING SETTING
DATA COLLECTION - LAST TEN CYCLES

C	CYC	INJ	PLC	TZ2	SIP	EIP	IPR	HPR	BPR
0	63,6	9,9	9,9	250	155	21,3	88	31	7
1	65,2	9,9	9,5	249	155	21,3	88	31	7
2	63,4	9,2	9,9	250	153	21,3	88	31	7
3	64,7	9,9	9,7	250	155	21,3	88	31	7
4	63,5	9,6	9,9	249	152	21,3	88	31	7
5	63,1	9,9	9,9	250	156	21,3	88	31	7
6	64,8	9,9	9,9	251	155	21,3	88	31	7
7	63,3	9,8	9,8	250	154	21,3	88	31	7
8	65,2	9,9	9,9	250	155	21,3	88	31	7
9	63,1	9,9	9,9	250	155	21,3	88	31	7

If PLC errors occur, check control panel for "*Printer not Ready Error*". Press ***Cancel*** to clear.

4. PLC Status - MIU 10X

4.1 Communications

The status of the MIU to PLC communications, as well as the raw data values from the PLC can be viewed at the MIU service display. The service display can be reached by entering “22” <MIU Information> at the Main Menu, and selecting Item 2. The status of the transmission and data reception can be seen, as well as the time required to collect the data. In addition, the raw values of all enabled parameters is displayed.

4.2 Current Values

The actual values received from the PLC can be viewed at the MIU by selecting Menu 12 <View Parameters>. The actual data values for the last PLC data request will be displayed

PULSE 2
PULSE 3
PULSE 4
ANALOG 1
ANALOG 2
ANALOG 3
ANALOG 4
ANALOG 5
ANALOG 6
ANALOG 7
ANALOG 8

5. Installation Checklist

Installation of a PLC interface is easily accomplished by following the checklist below:

1. Check the MIU and PLC serial board for the following items:

    a) EPROM - each PLC interface has a corresponding EPROM, verify the part number and latest revisions; refer to *Section 5.1* of this manual.

    b) The MIU must have the proper interface jumpers set (i.e. RS-232, RS-485/422, or current loop). The type is defined in section 6 of this manual for each interface. The jumper configuration is found in the MIU Wiring / Installation Guide, 710-0043, as well as in this manual.

2. Verify that the correct wiring configuration has been used - refer to the wiring diagrams located in Section 6.

3. The BAUD rate setting for the serial port in the PLC must match the baud rate listed in *Section 5.1*

4. Check the MIU configuration record of the appropriate machine # for the proper PLC interface and parameter settings.

5. If communications cannot be established, perform the loop back test as described in this manual.

NOTE: A "JOB" must be assigned and running on the ProHelp system before any data requests will be made of the control.

5.1 PLC Interface Summary

PLC Type	Release 2.4x	Release 2.5x, 2.6x	Type	Baud
Barber Coleman MACO 8000	7505	7605	RS 232	4800
Battenfeld Unilog 4000B	7508	7608	RS 232	4800
Battenfeld Unilog 4000B (Baud Rate)	7523	7623	RS 232	9600
Buhl PPC 90	7509	7609	RS 232	4800
Cincinnati Milacron ACT (FANUC)	7506	7606	RS 232	4800
Cincinnati Milacron Camac VLC/VEL	7502	7602	RS 485	4800
Cincinnati Milacron Camac XTA/XTC	7502	7602	RS 232	4800
Cincinnati Milacron CAMAC XTL	7504	7604	RS 485	4800
Engel EC88 / CC90	7518	7618	RS 232	4800
Engel EC88 / CC90 (Baud Rate)	7528	7628	RS 232	9600
Gefran Elettronica	7516	7616	RS 485	1200
HPM CMD 90	7524	7624	RS 232	4800
INOEX Saveomat	7525	7625	RS 232	4800
INOEX Saveomat 93	7527	7627	RS 232	4800
Klockner FMT	7507	7607	RS 485	9600
Klockner MPC-80	7514	7614	RS 232	9600
Maruka Toyo	7510	7610	RS 232	4800
Mitsubishi MAC VI	7521	7621	RS 232	4800
Moog MOPAC 22MP	7511	7611	RS 232	4800
Moog MOPAC 22	7503	7603	RS 232	4800
Nissei 9000G	7522	7622	RS 232	4800
Nissei 8300F	7517	7617	RS 232	4800
Nissei 8000	7529	7629	RS 232	4800
SCI Scoremaster	7512	7612	RS 485	4800
Siemens AS 511	7513	7613	Current Loop	9600
Siemens / Demag / Van Dorn EL Pathfinder	7513	7613	Current Loop	9600
Siemens 944	7520	7620	Current Loop	9600
Toshiba EX100	7515	7615	RS 485	9600
VanDorn CRT C	7519	7619	RS 485	4800
VanDorn 4500 (SPI Protocol)	7526	7626	RS 485	4800

5.2 Loop-Back Test

An MIUs PLC related hardware can be tested using manual diagnostic's loop-back test (PLC is Comm 3). All jumpers must be in place at the time you apply power to the MIU (changing anything during diagnostics will void all results). Com Port diagnostics can be invoked by re-booting the MIU and selecting the diagnostics mode during boot. Tests are available to check the com port as well as in loop back mode.

JUMPER WIRES FOR LOOP-BACK

See the "*Module Description*" Section of this Manual

RS-232	Jump pin 1 to pin 2 and pin 3 to pin 4.
RS-485	Jump pin 1 to pin 3 and pin 2 to pin 4.
CURRENT LOOP	Jump pin 1 to pin 3 and pin 2 to pin 4.

6. Wiring Diagrams

6.1 MIU 10X

This application note describes the interface connections to currently supported PLC interfaces. Those interface types supported are those that use one of three standard communications protocols. RS-232C, RS-422/RS-485, and Current Loop. Current implementation requires that shielded communications cable be used to minimize noise problems, and that the PLC end be defined as the “source”. Thus, the shield should be grounded at the PLC end only. However, if necessary, provision has been made to allow tying the shield to ground at the MIU end.

The PLC interface on the MIU 10X board has been designed to allow any one of the three communications protocols depending on the jumper settings. Refer to Manual 710-0043 for the correct jumper settings.

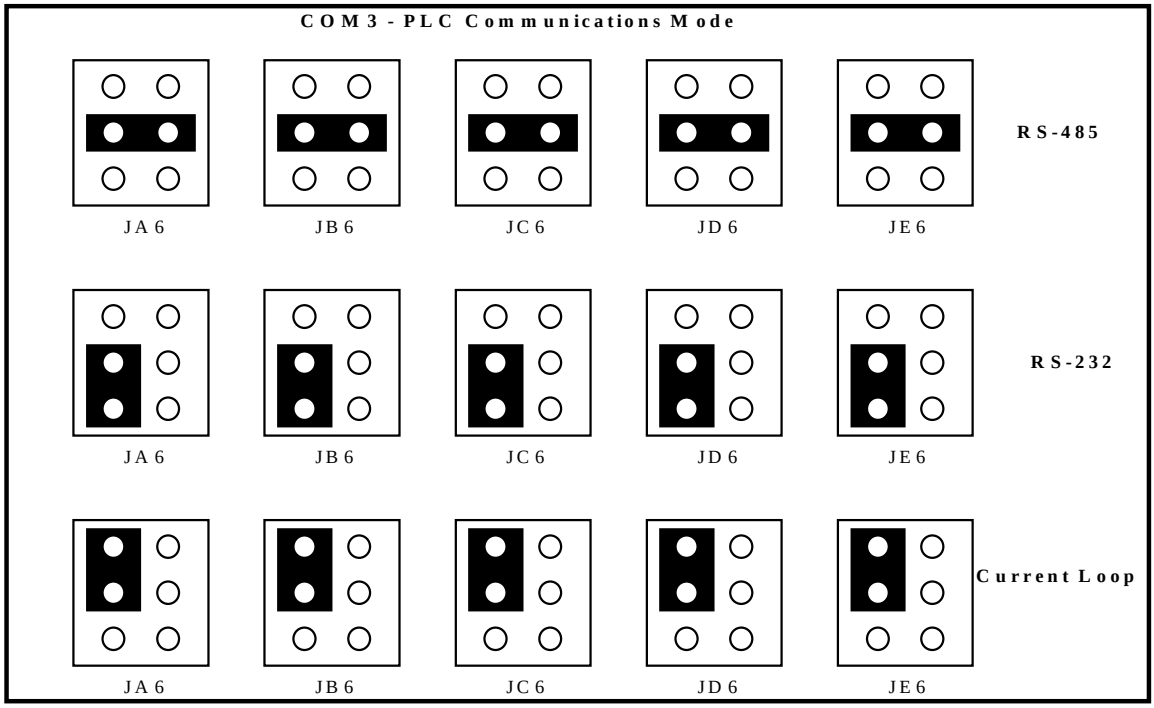

Figure 6-1 PLC Jumper Settings

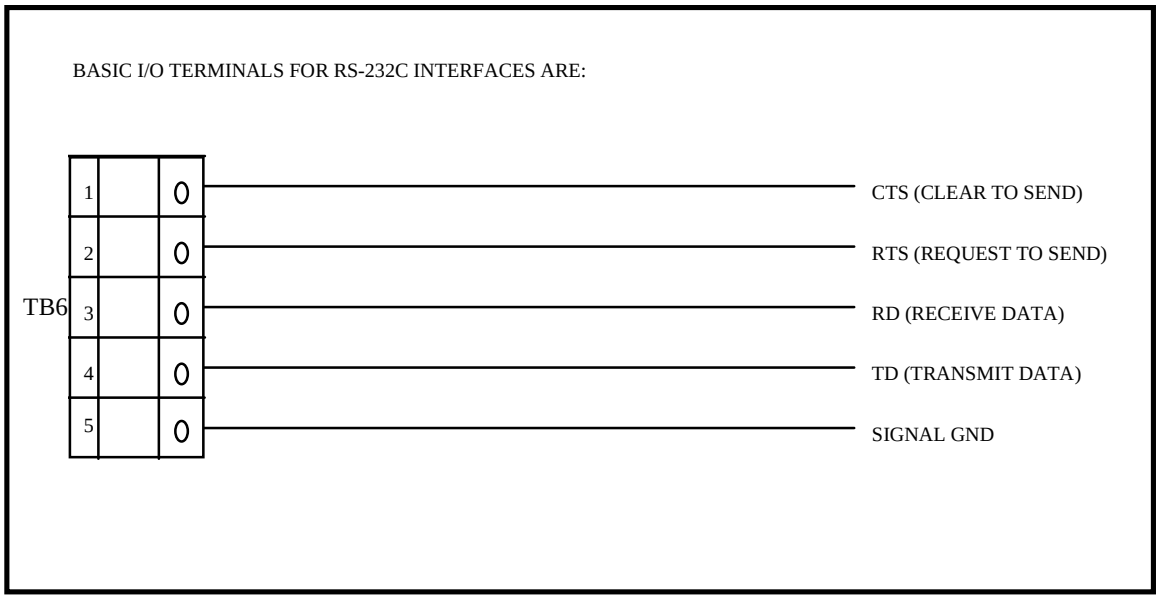

Figure 6-2 Basic RS 232 Wiring

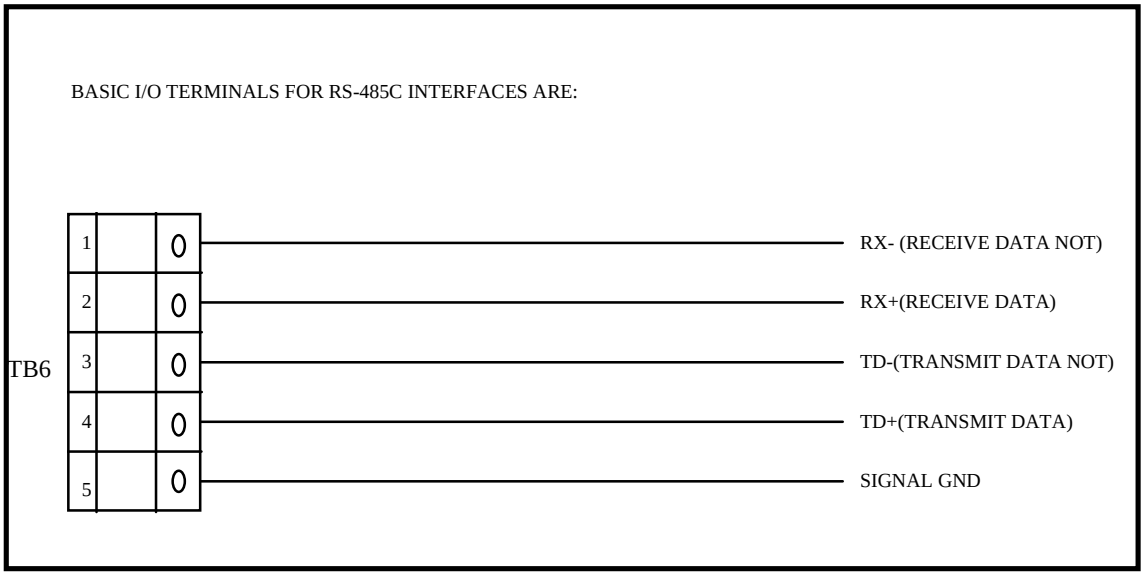

Figure 6-3 Basic RS 485 Wiring

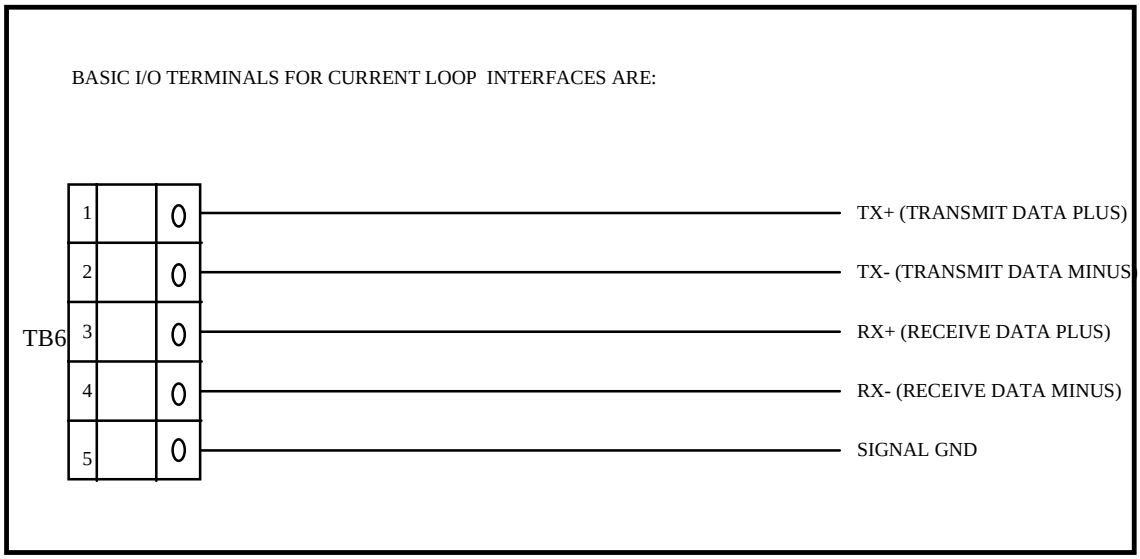

Figure 6-4 Basic Current Loop Wiring

6.1.1 Allen Bradley

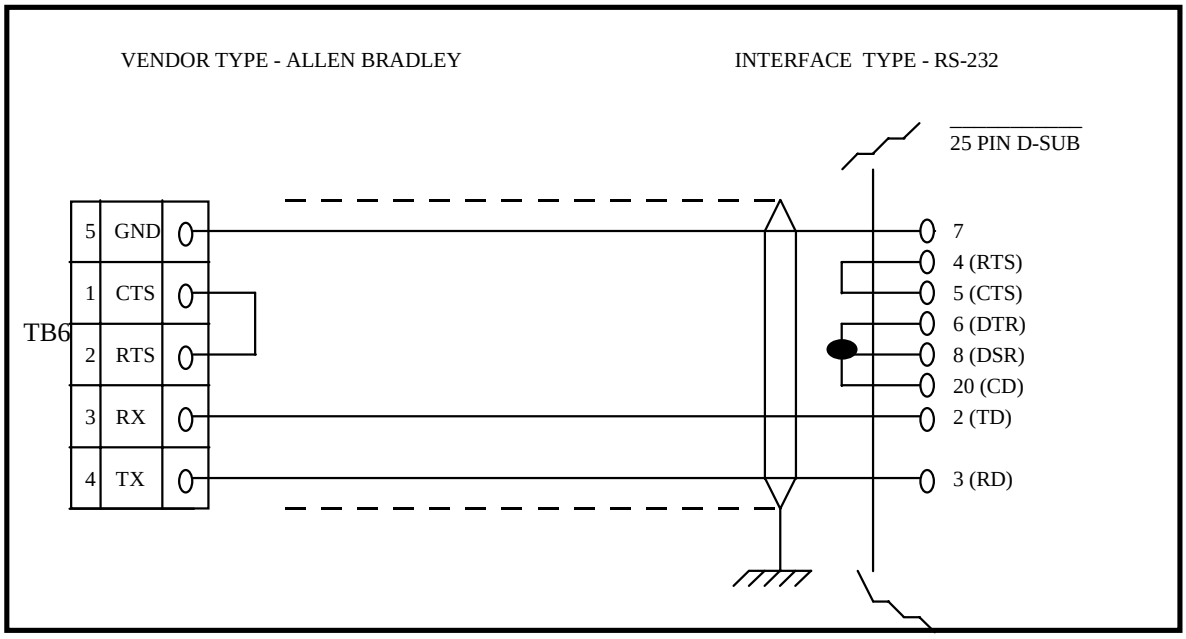

Figure 6-1 Allen Bradley

6.1.2 Barber Coleman MACO 8000/VanDorn CRT-B

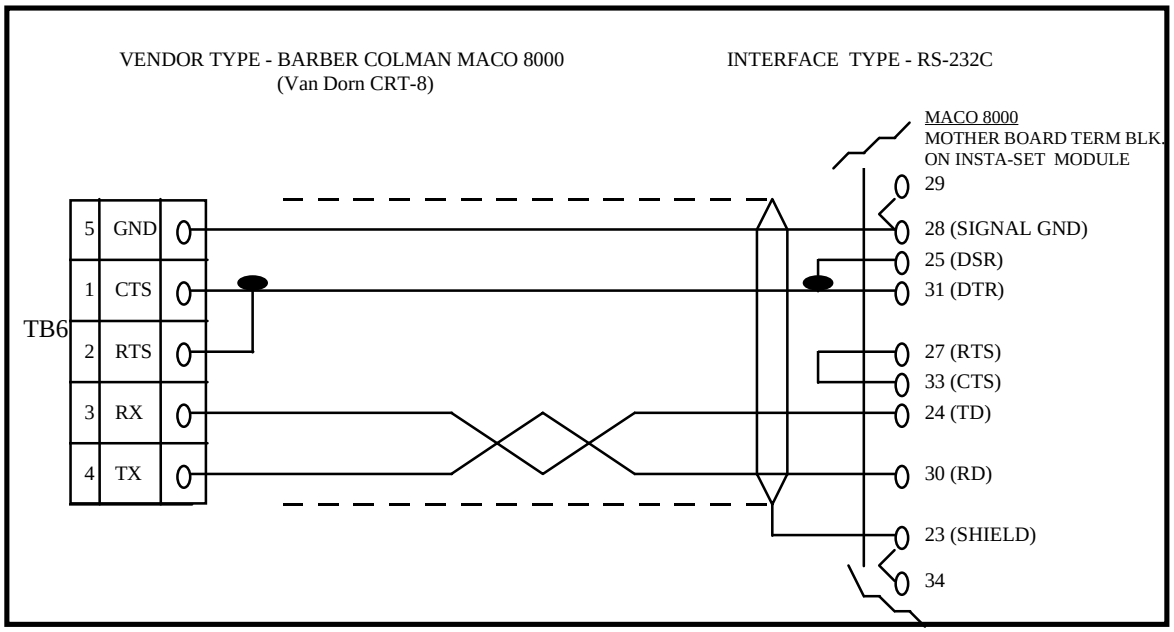

Figure 6-1 Barber Coleman

6.1.3 Battenfeld Unilog 4000B

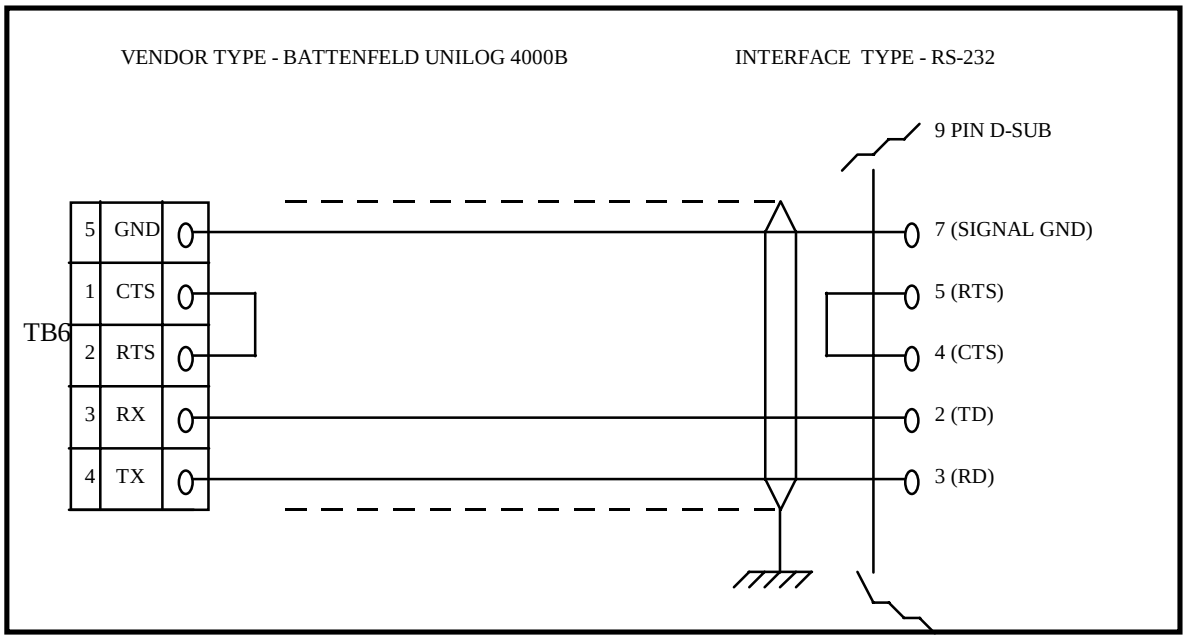

Figure 6-1 Battenfeld Unilog 4000B

6.1.4 Buhl PPC90

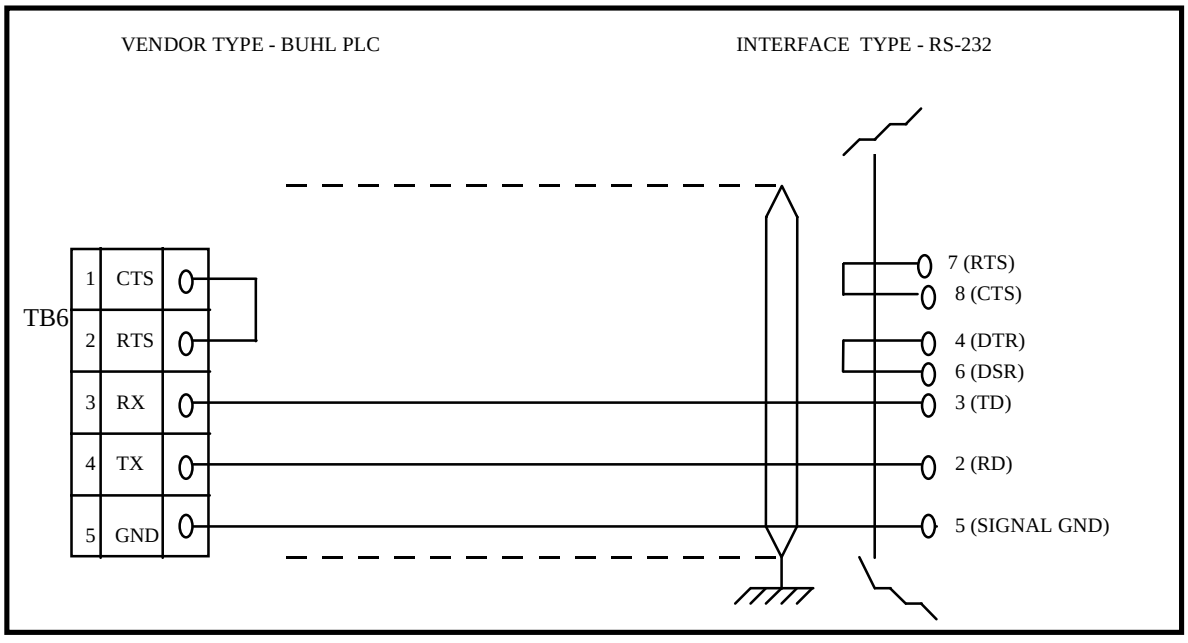

Figure 6-1 Buhl

6.1.5 Cincinnati Milacron ACT

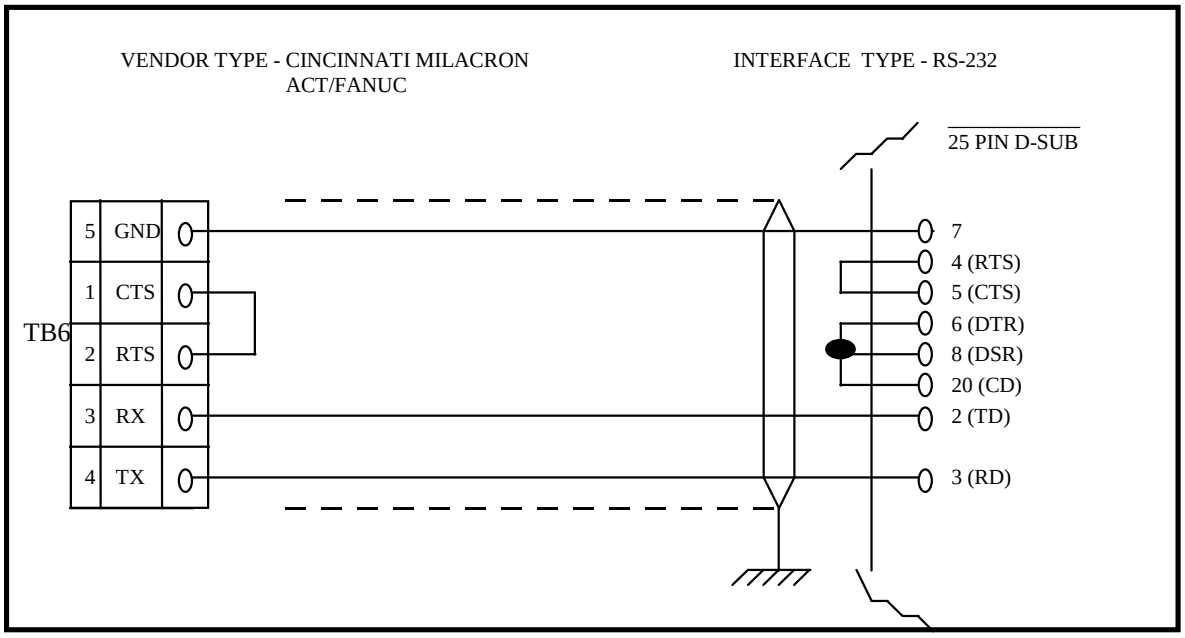

Figure 6-1 Cinti. Milacron ACT/FANUC

6.1.6 Cincinnati Milacron CAMAC XTL

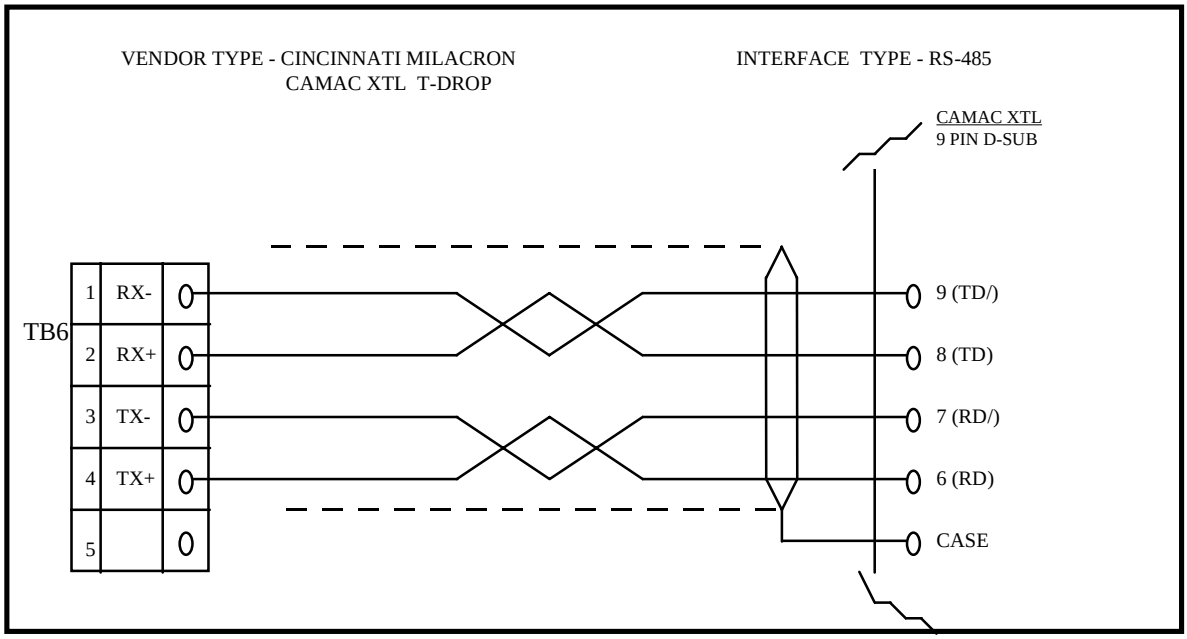

Figure 6-1 Cinti. Milacron CAMAC XTL

6.1.7 Cincinnati Milacron CAMAC XTA/XTC

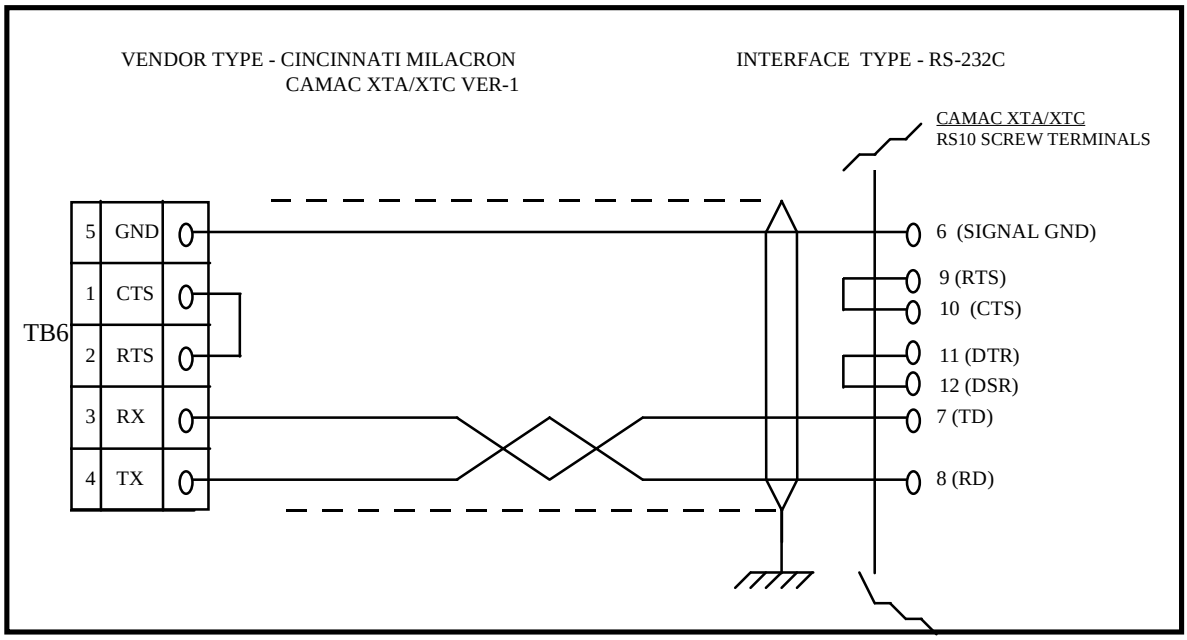

Figure 6-1 Cinti. Milacron Camac XTA/XTC

6.1.8 Cincinnati Milacron CAMAC VLC/VEL

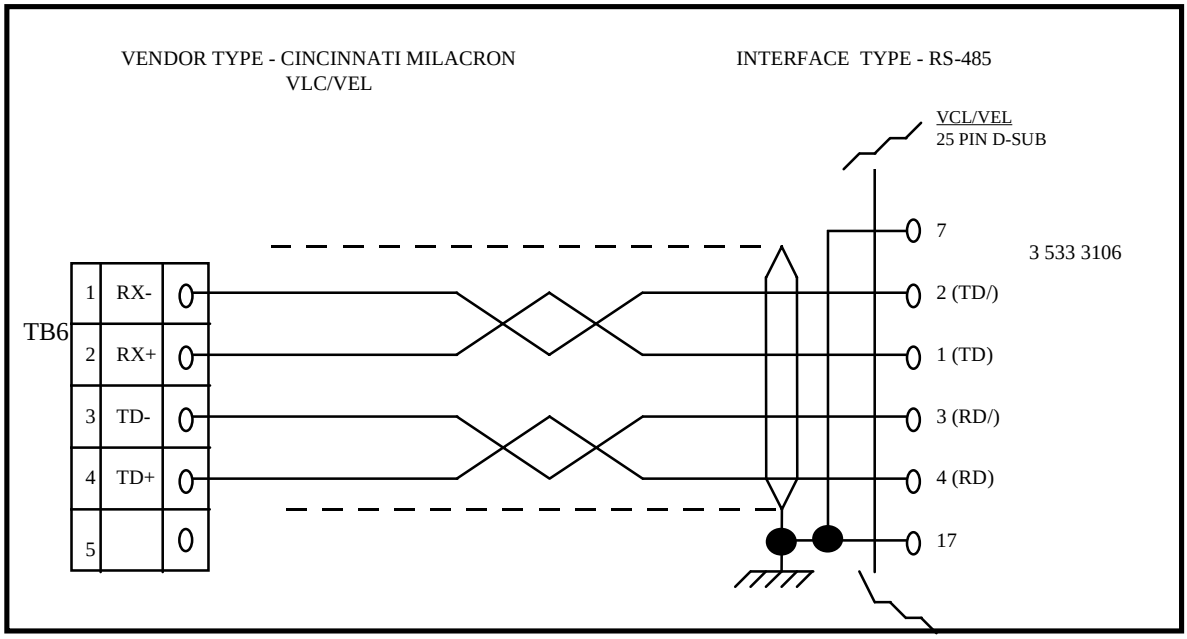

Figure 6-1 Cinti. Milacron VLC/VEL

6.1.9 Cincinnati Milacron Ferromatic

PUT CORRECT WIRING DIAGRAM IN

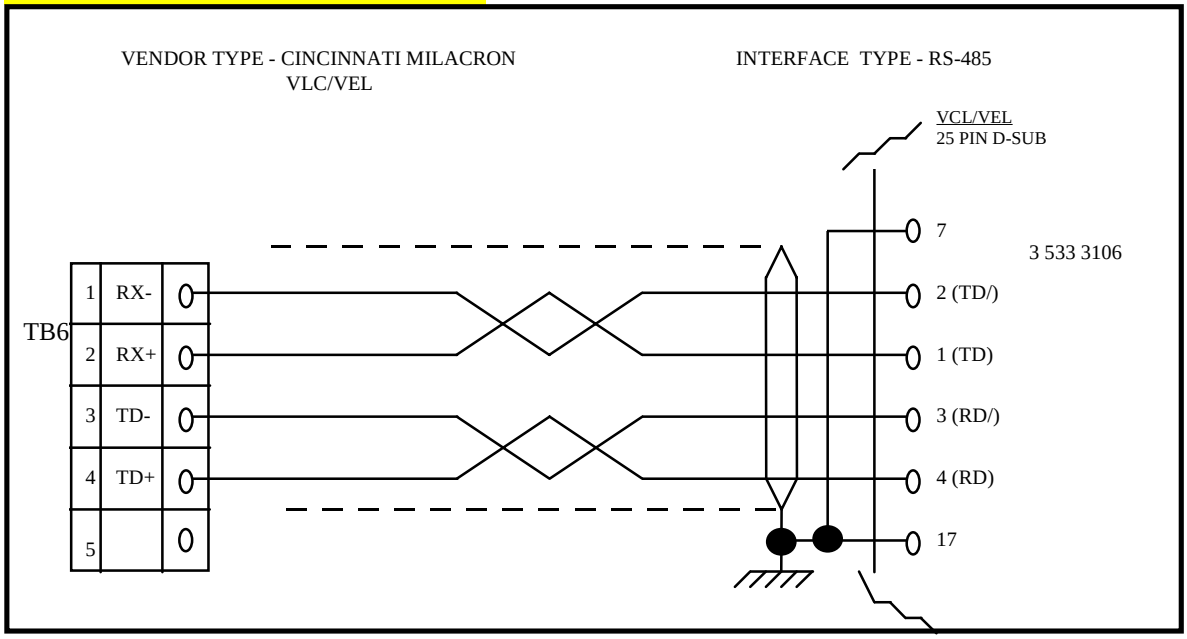

Figure 6-1 Cincinnati Milacron Ferromatic

6.1.10 Engel EC88/CC90

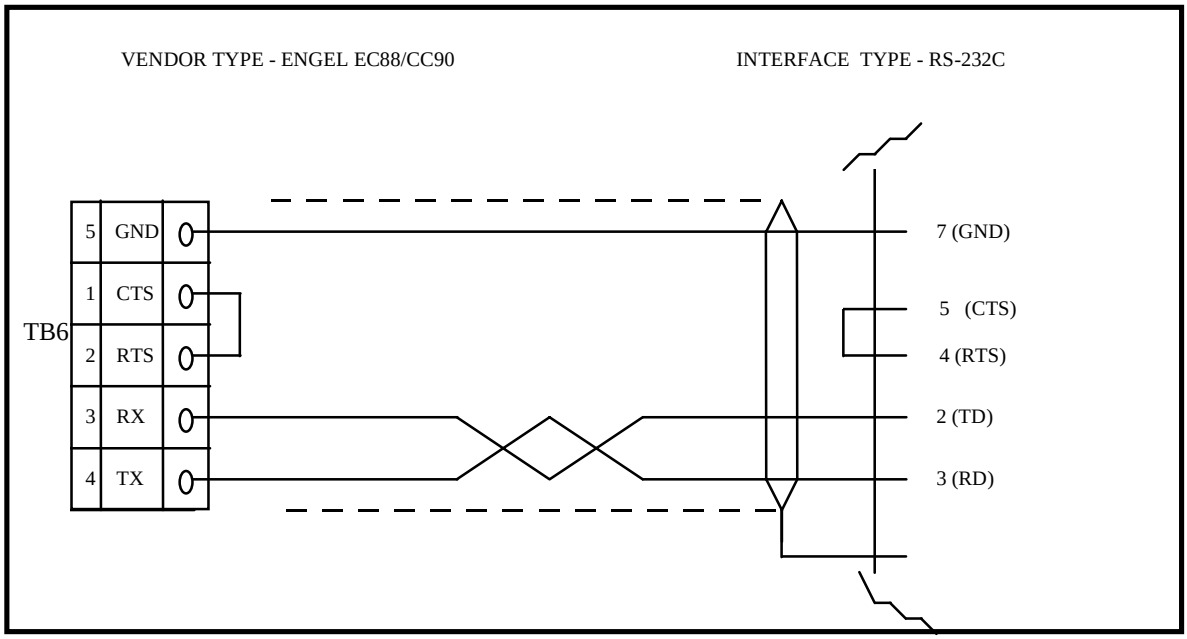

Figure 6-1 Engel EC88/CC90

6.1.11 Gefran Elettronica

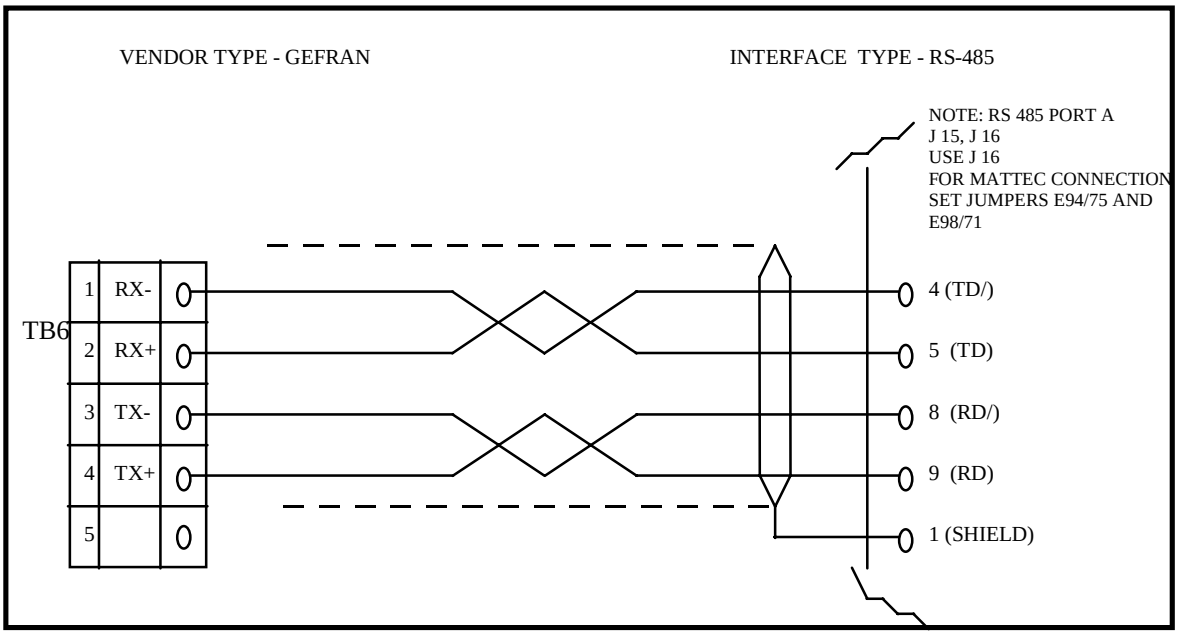

Figure 6-1 Gefran Elettronica

6.1.12 Gefran Elettronica Negri EL2

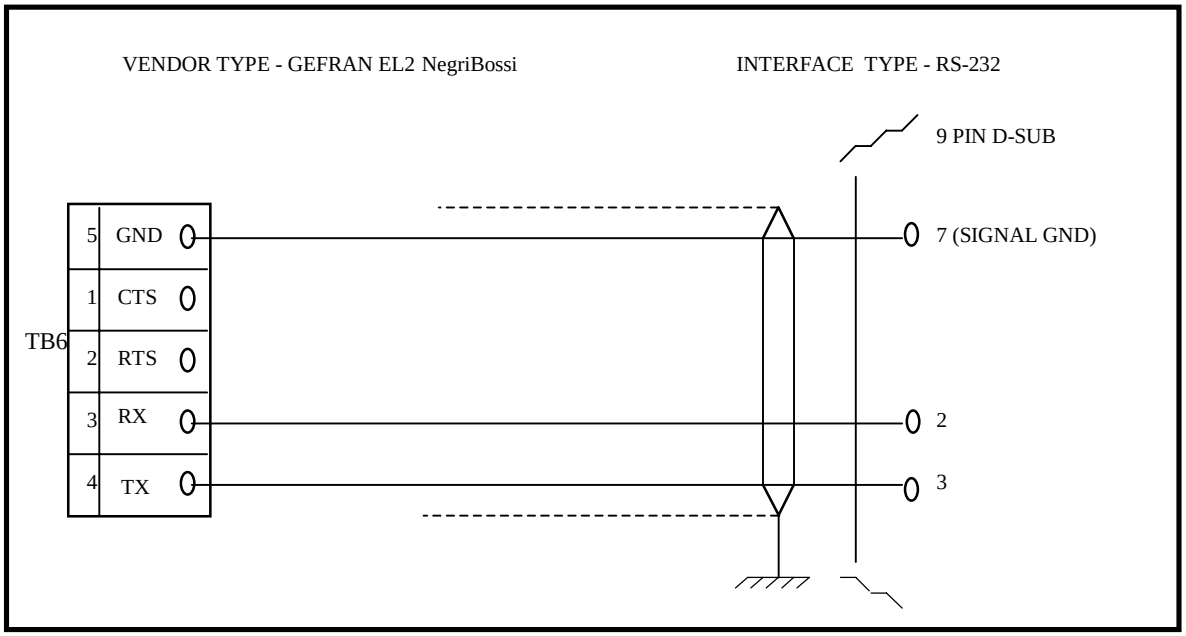

Figure 6-1 Gefran Elettronica Negri EL2

6.1.13 Gefran NegriBossi Printer

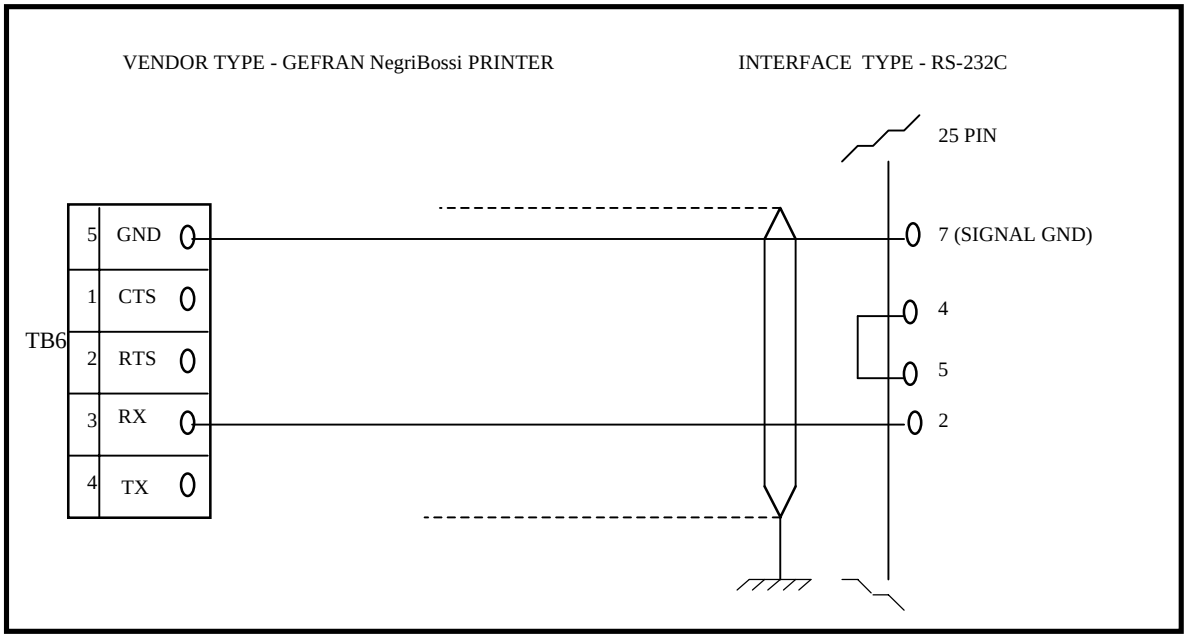

Figure 6-1 Gefran NegriBossi Printer

6.1.14 GE Fanuc

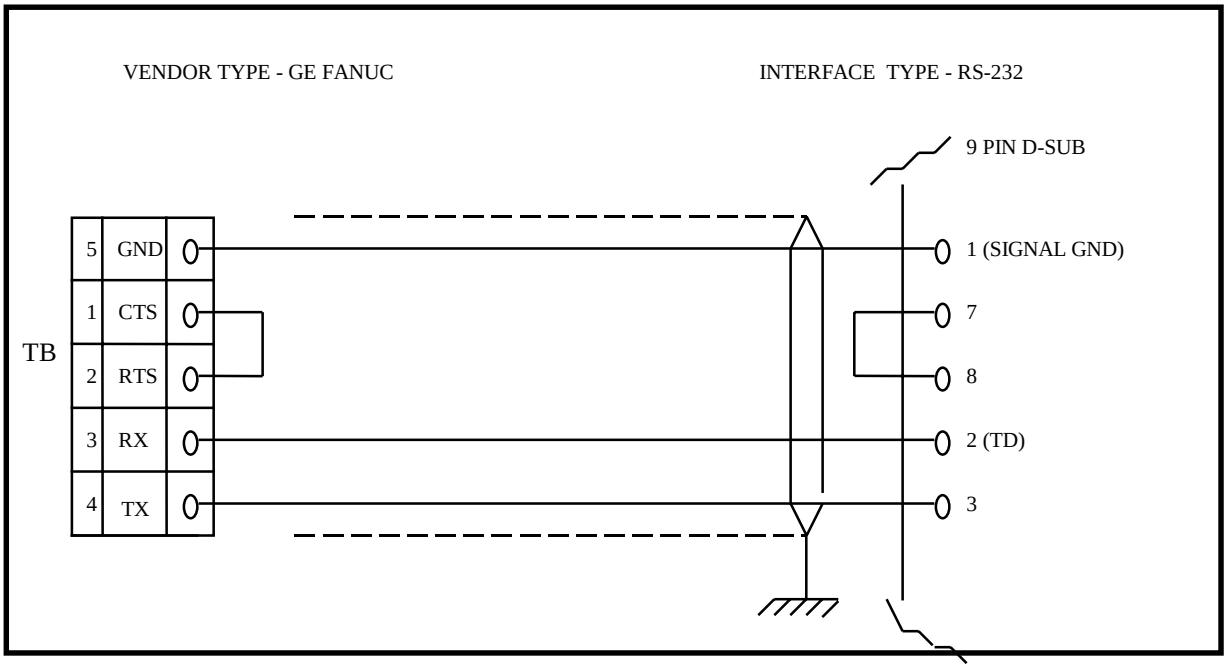

Figure 6-1 GE Fanuc

6.1.15 HPM CMD90

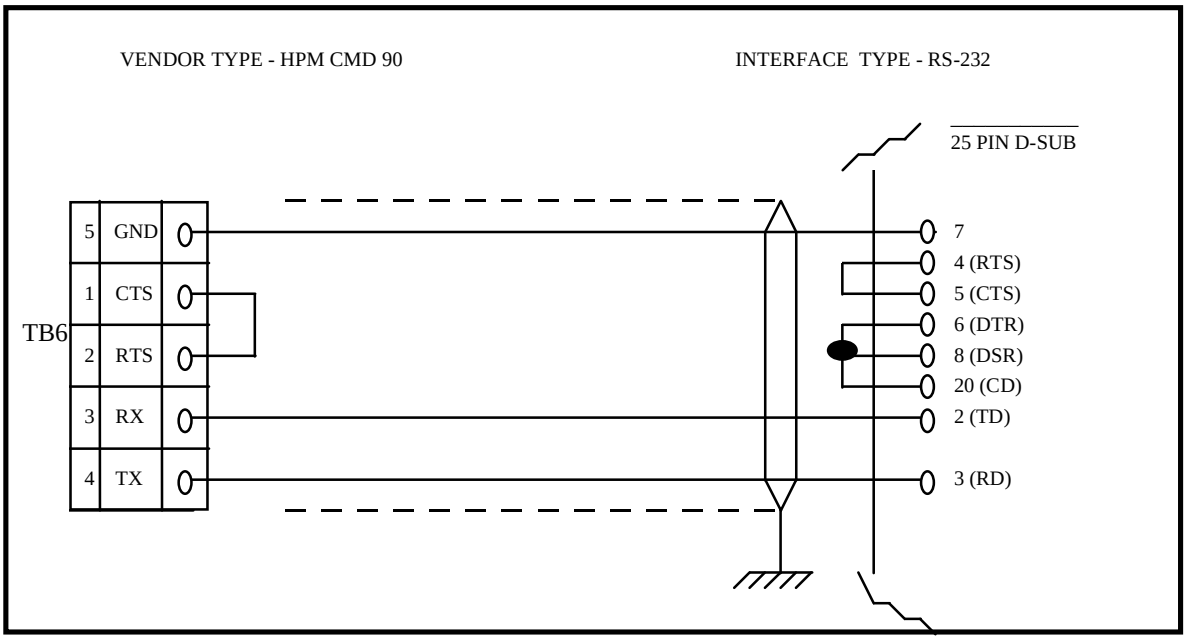

Figure 6-1 HPM CMD 90

6.1.16 Inoex Saveomat

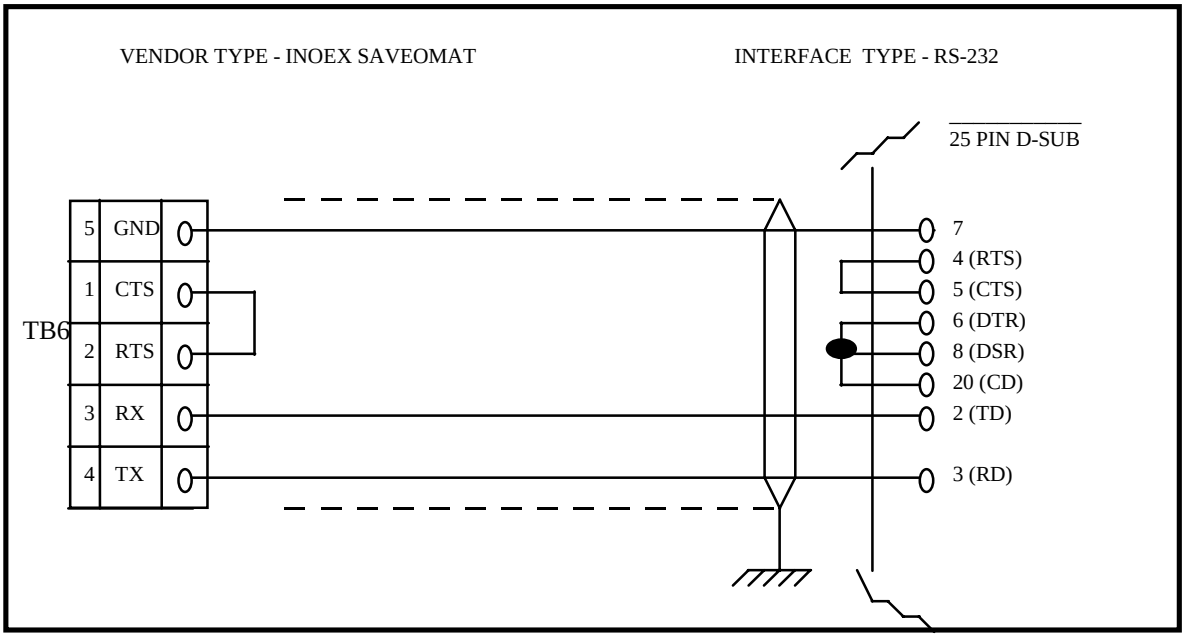

Figure 6-1 Inoex Saveomat

6.1.17 Inoex Saveomat 93

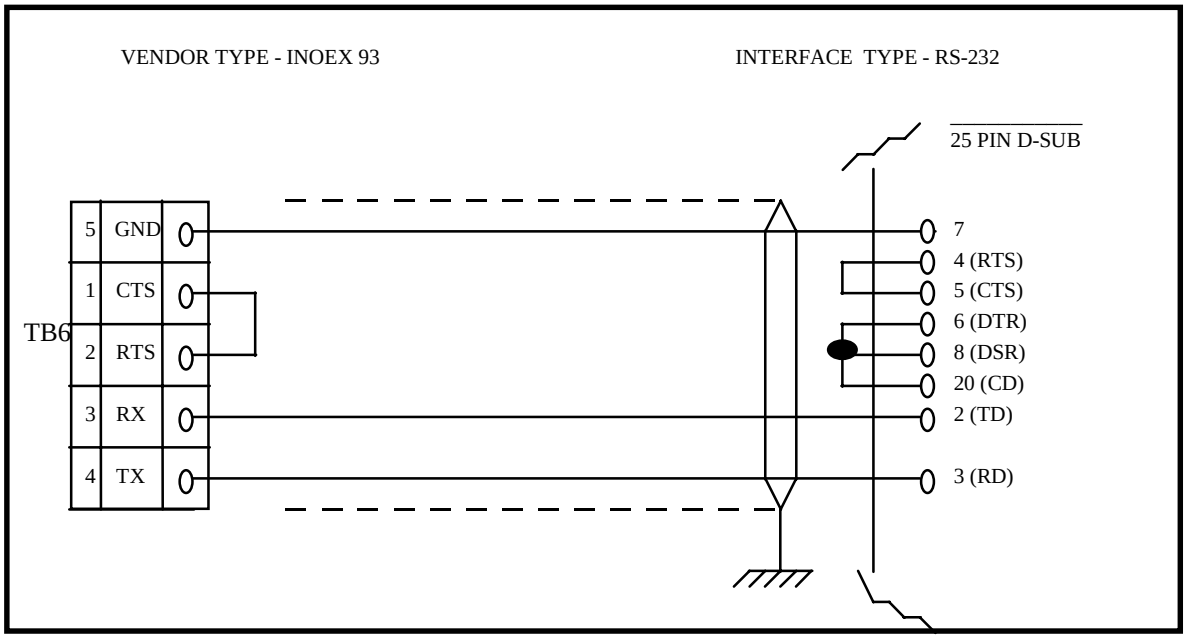

Figure 6-1 Inoex Saveomat 93

6.1.18 Klockner FMT

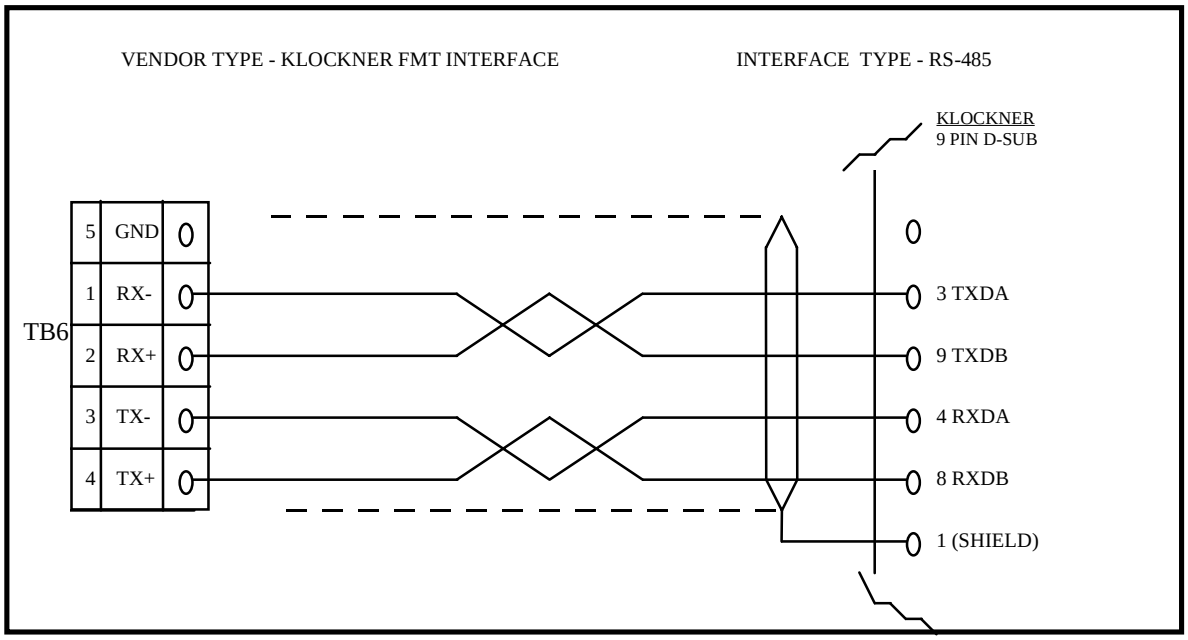

Figure 6-1 Klöckner FMT

6.1.19 Klockner MPC-80

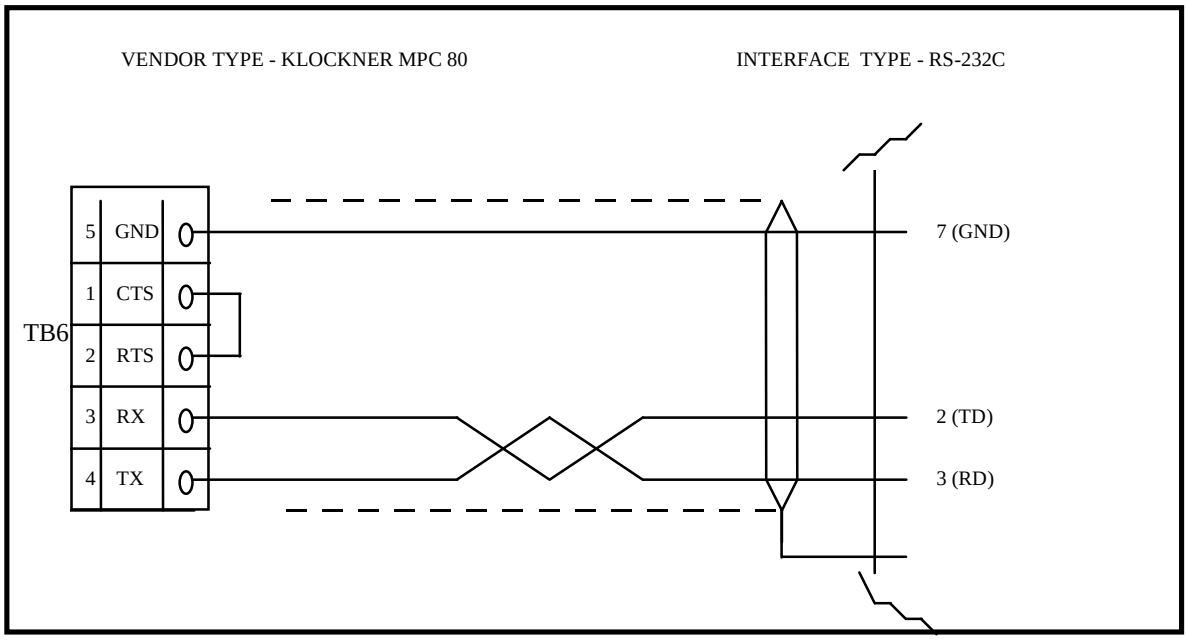

Figure 6-1 Klöckner MPC80

6.1.20 Krauss Maffei

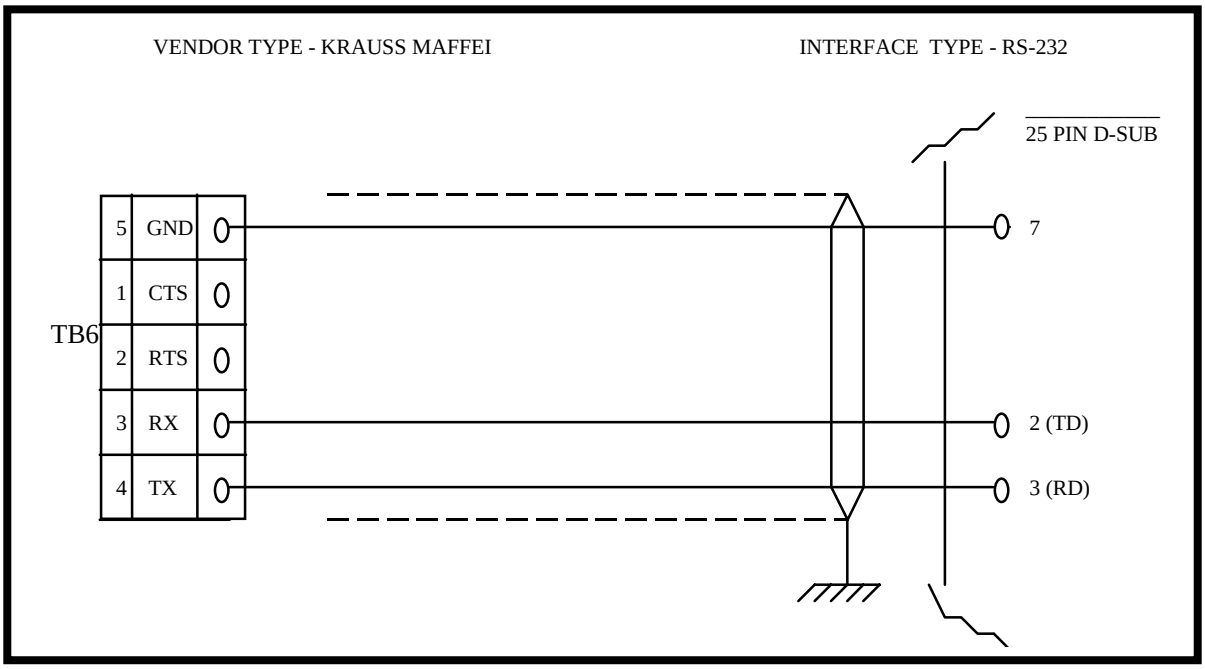

Figure 6-1 Krauss Maffei

6.1.21 Mac 90

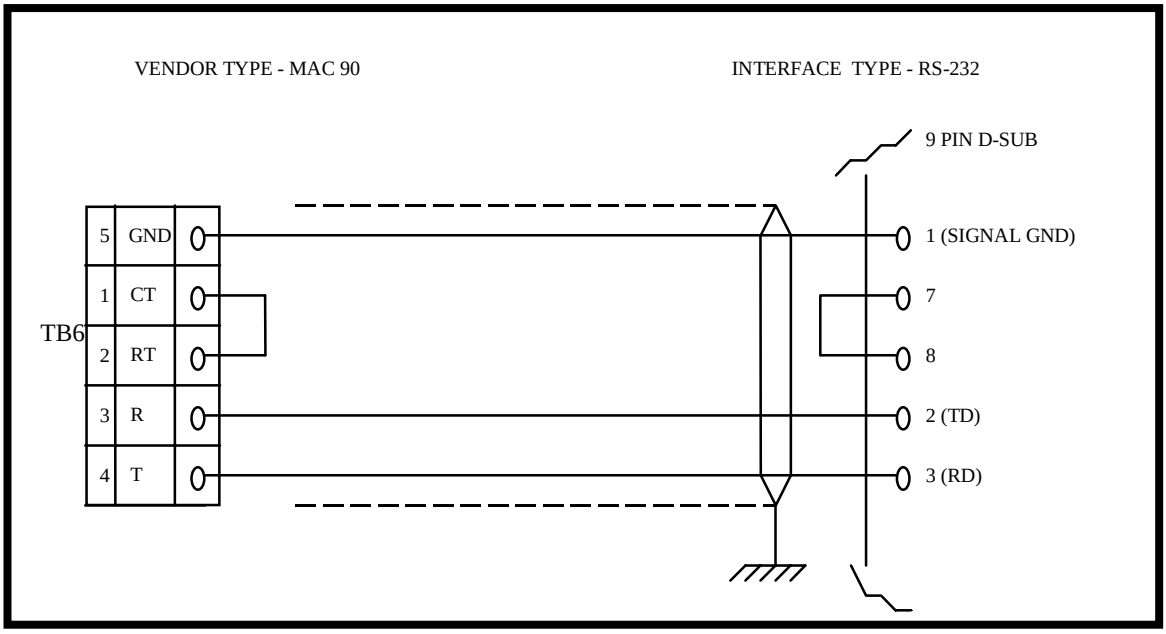

Figure 6-1 Mac 90

6.1.22 Maruka Toyo

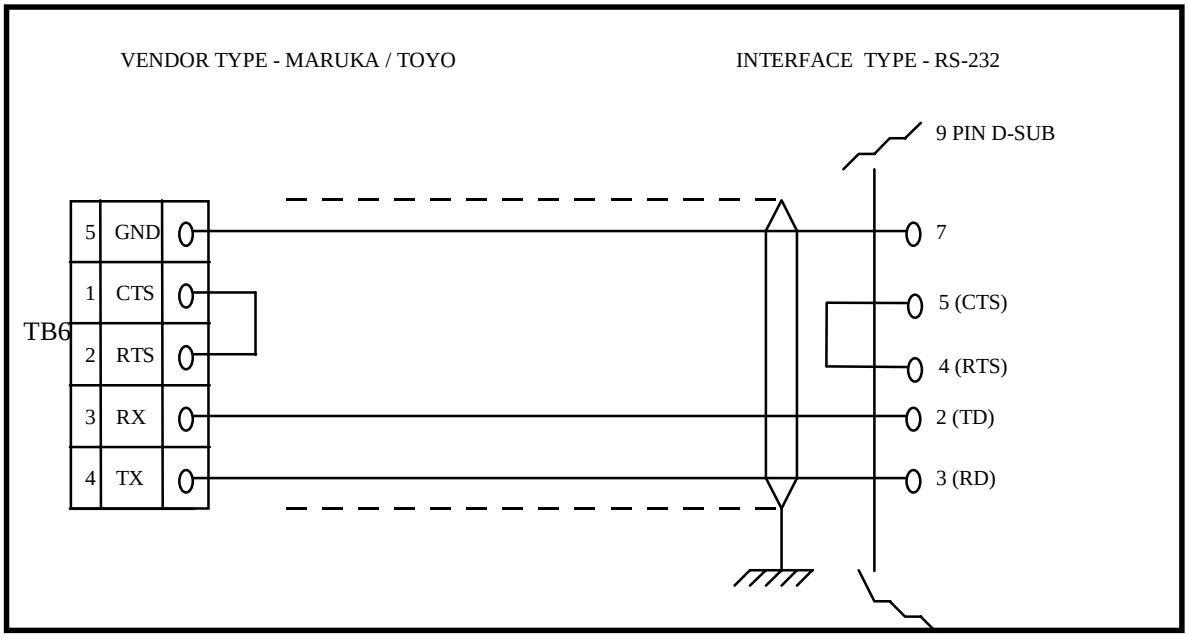

Figure 6-1 Maruka Toyo

6.1.23 Mitsubishi MAC-VI

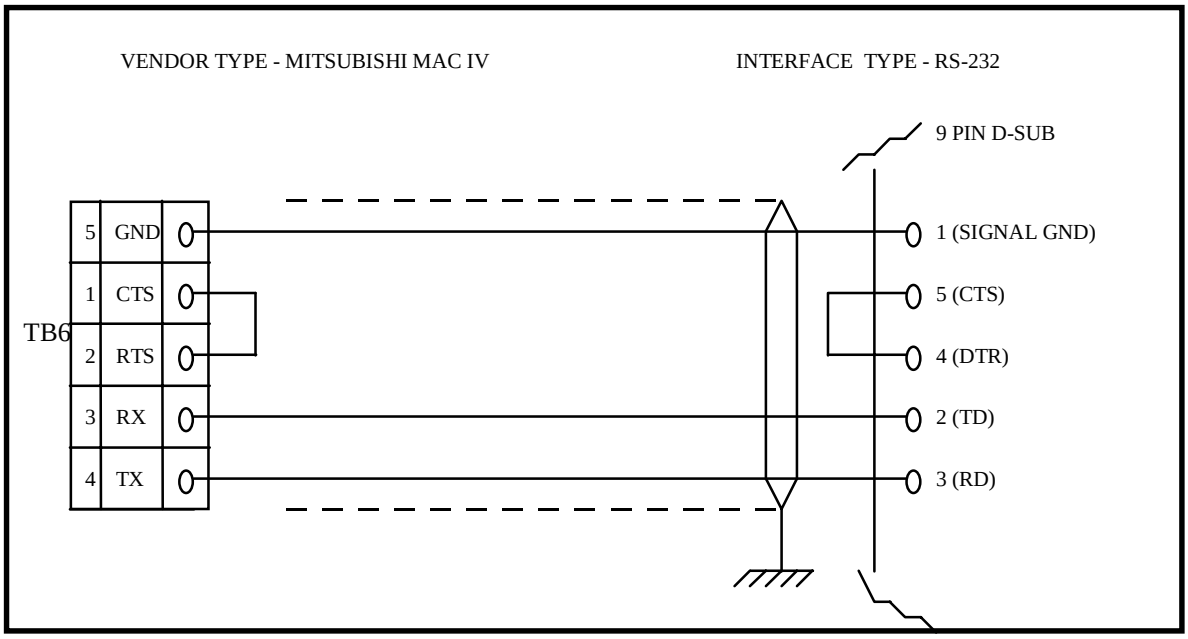

Figure 6-1 Mitsubishi MAC VI

6.1.24 Moog Mopac 22 MP (Modicon Protocol)

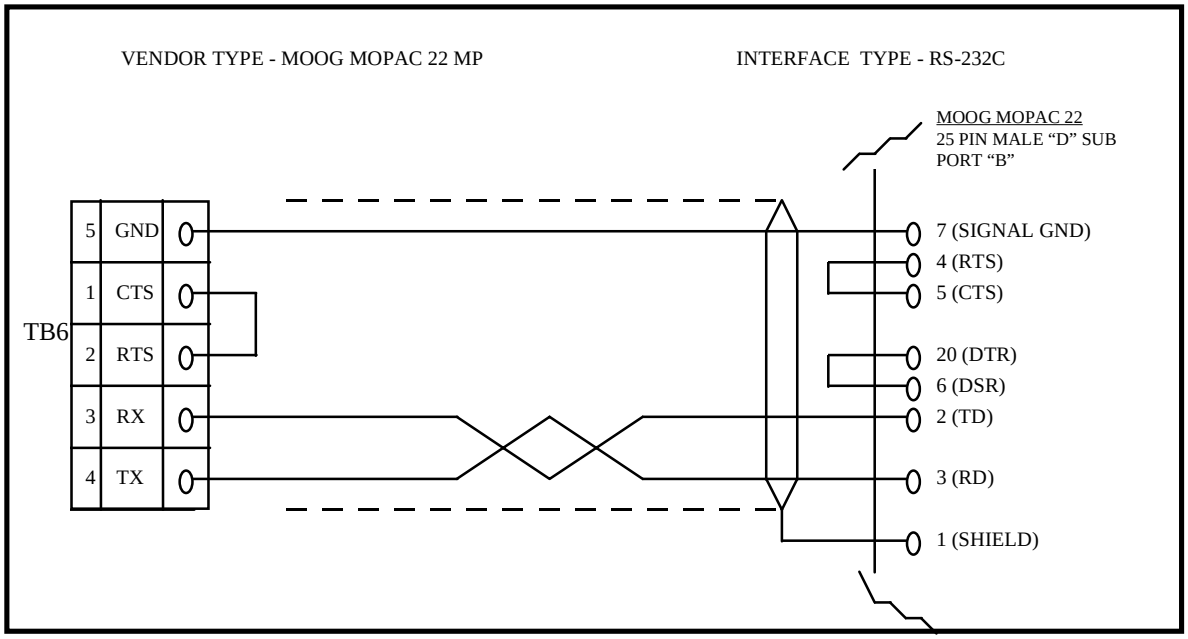

Figure 6-1 Moog Mopac 22 MP

6.1.25 Moog Mopac 22

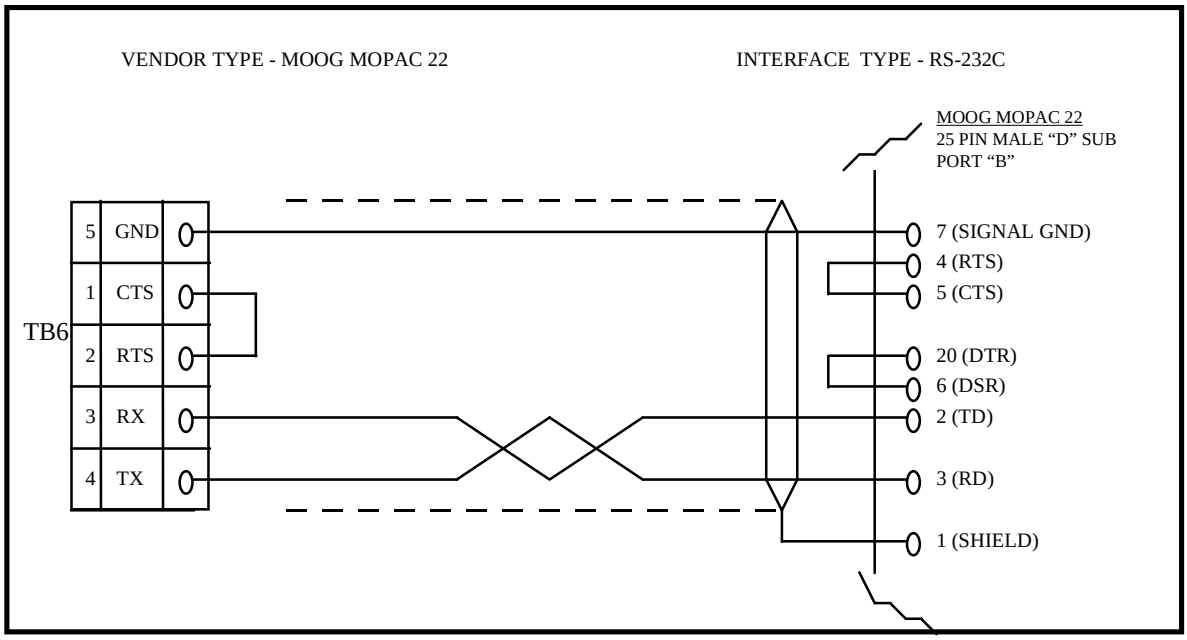

Figure 6-1 Moog Mopac 22

6.1.26 Netstall

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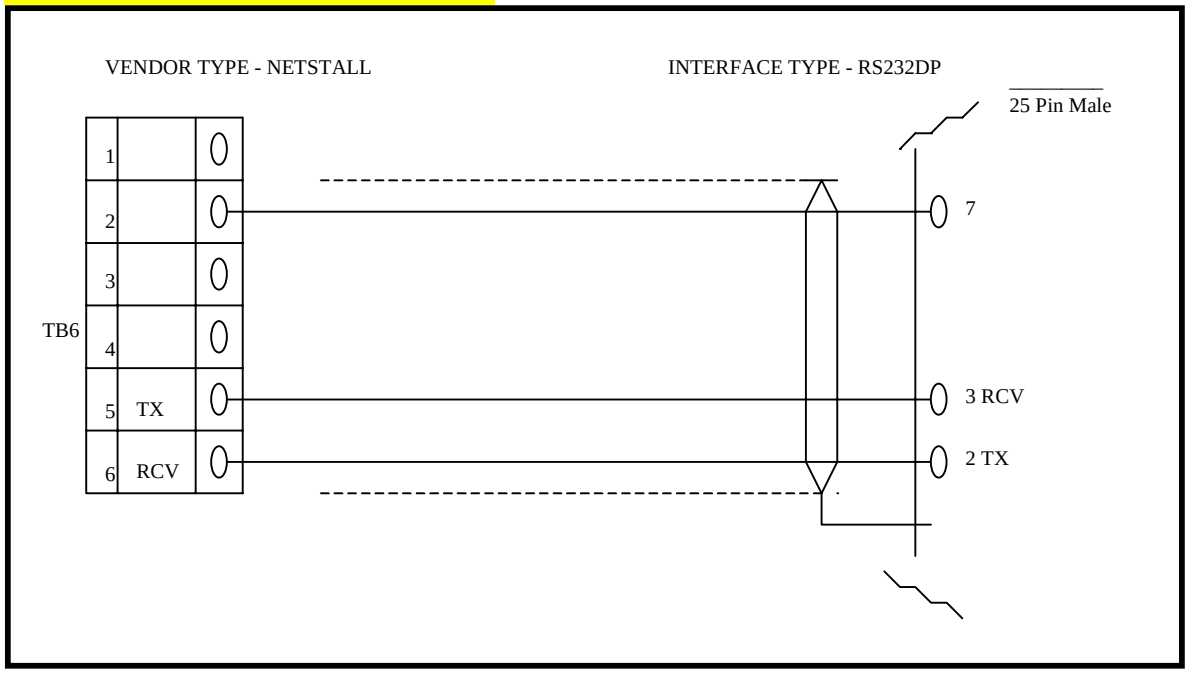

Figure 6-1 Netstall

6.1.27 Nissei 9000G, 8300F and 9300T

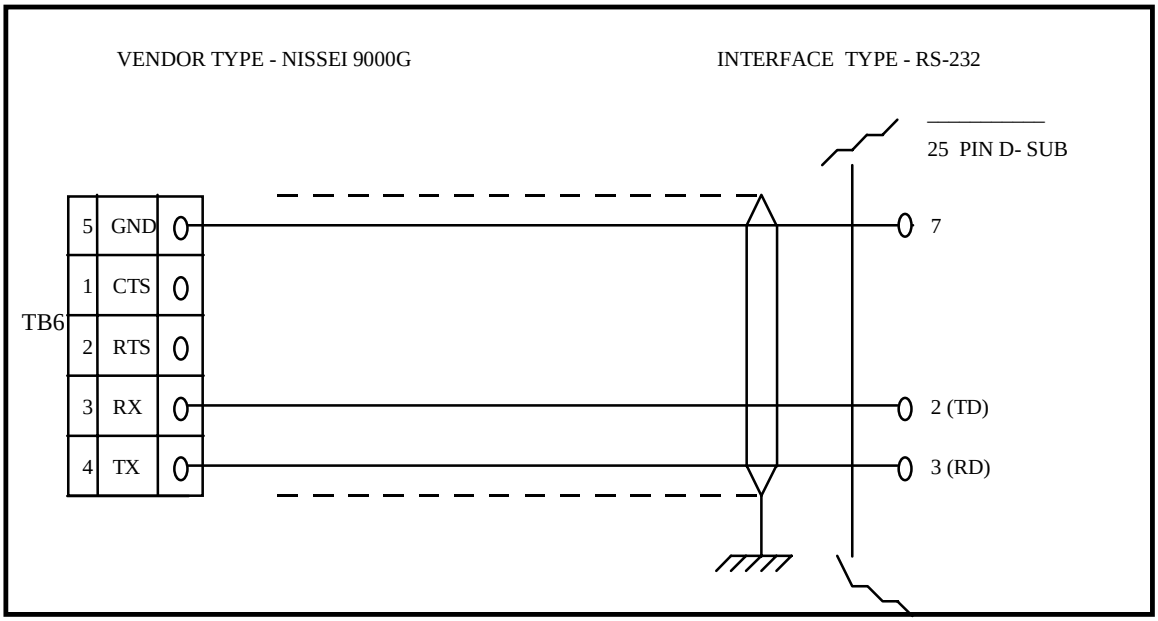

Figure 6-1 Nissei 9000G - 25 Pin D-sub

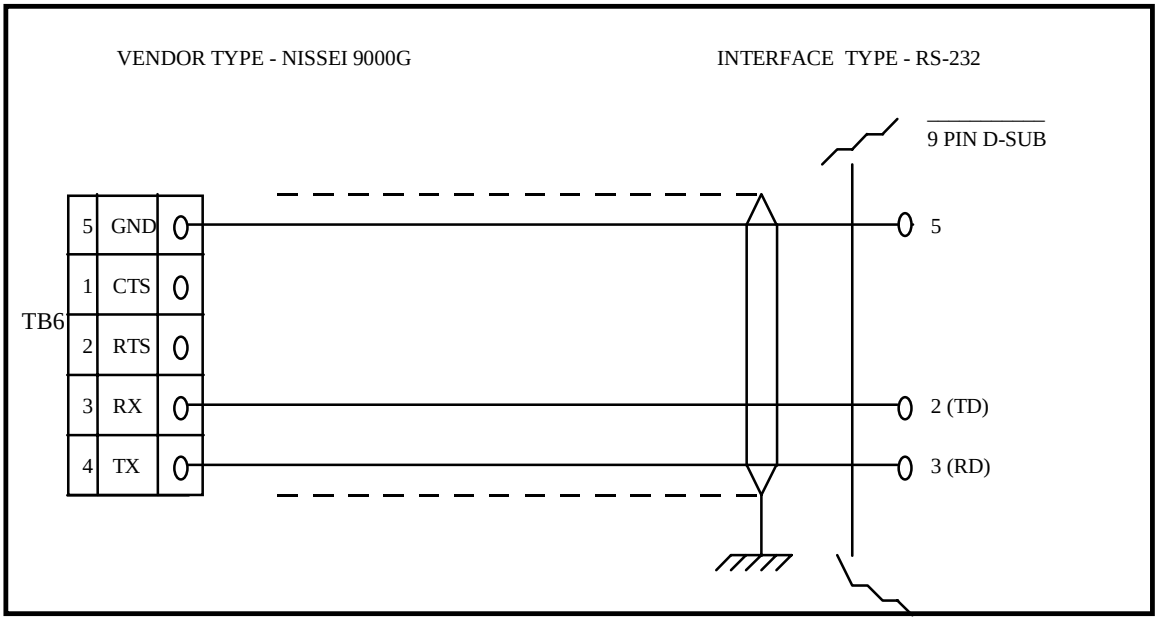

Figure 6-2 Nissei 9000G - 9 Pin D-sub

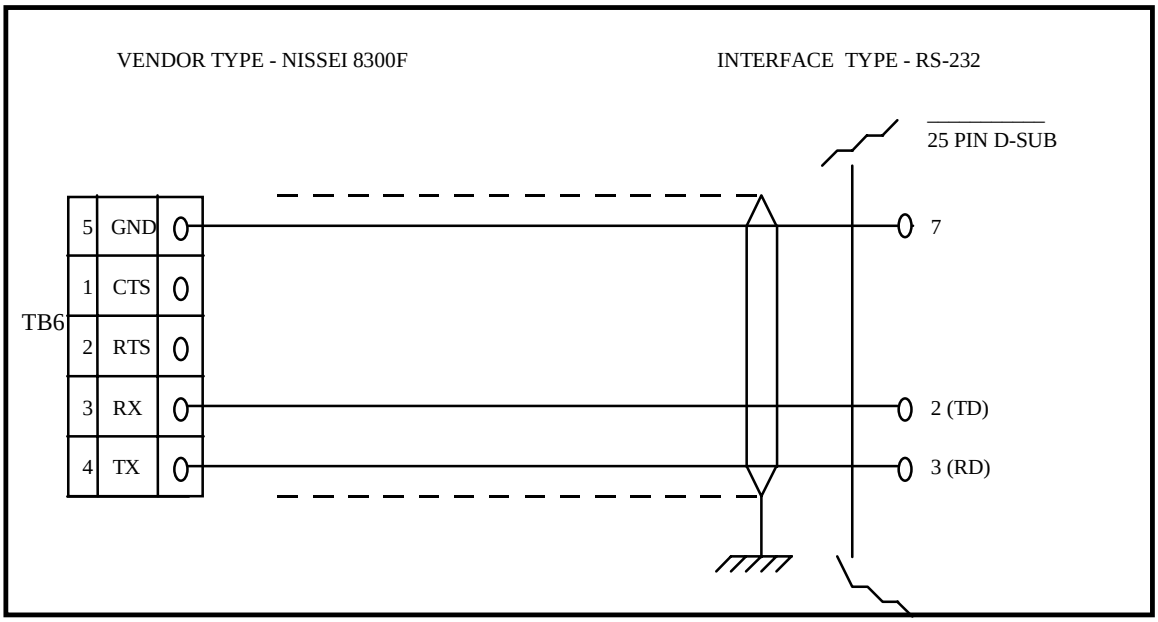

Figure 6-3 Nissei 8300 F

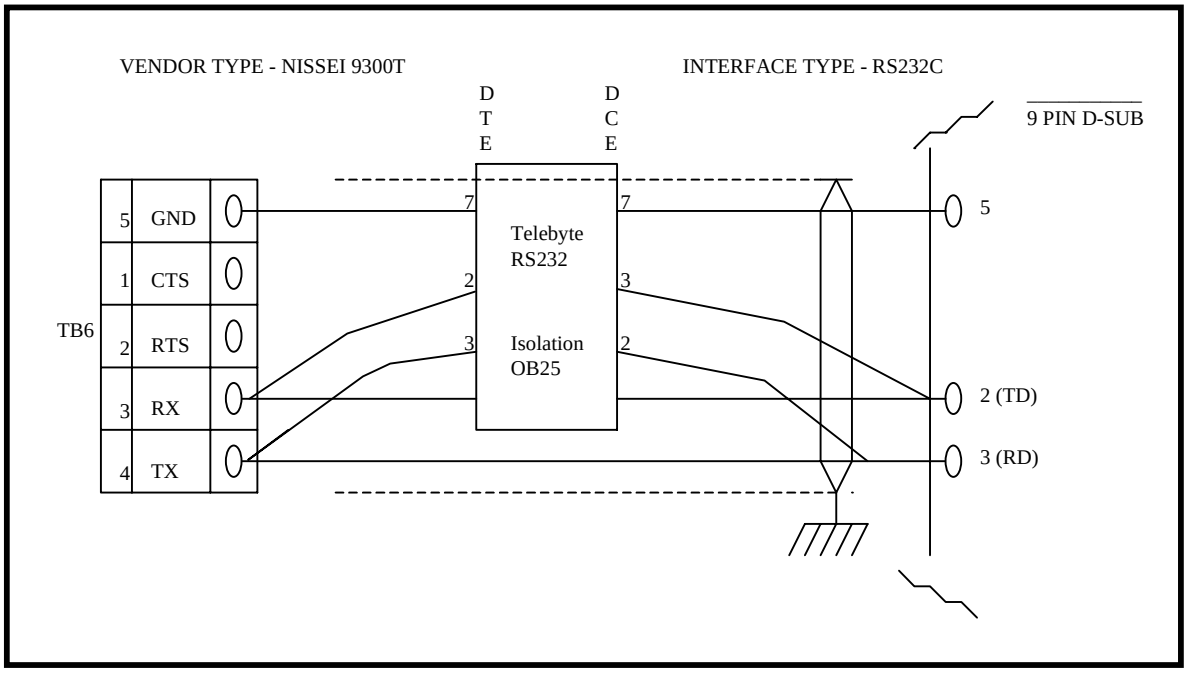

Figure 6-4 Nissei 9300T

6.1.28 Nissei 8000

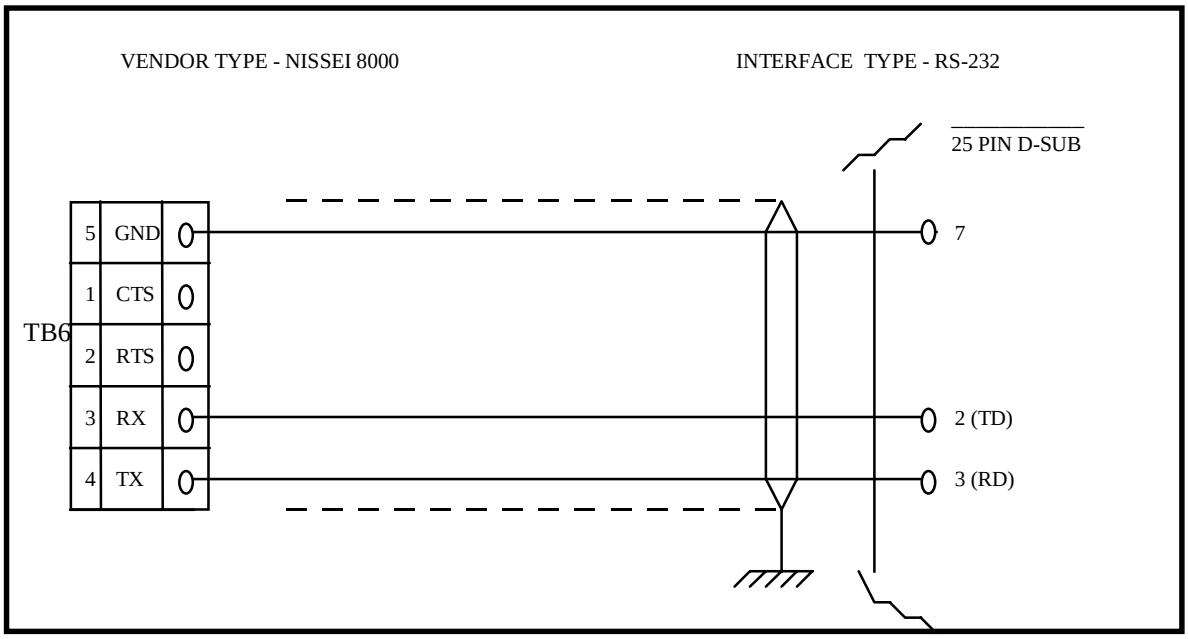

Figure 6-1 Nissei 8000

6.1.29 SCI Scoremaster

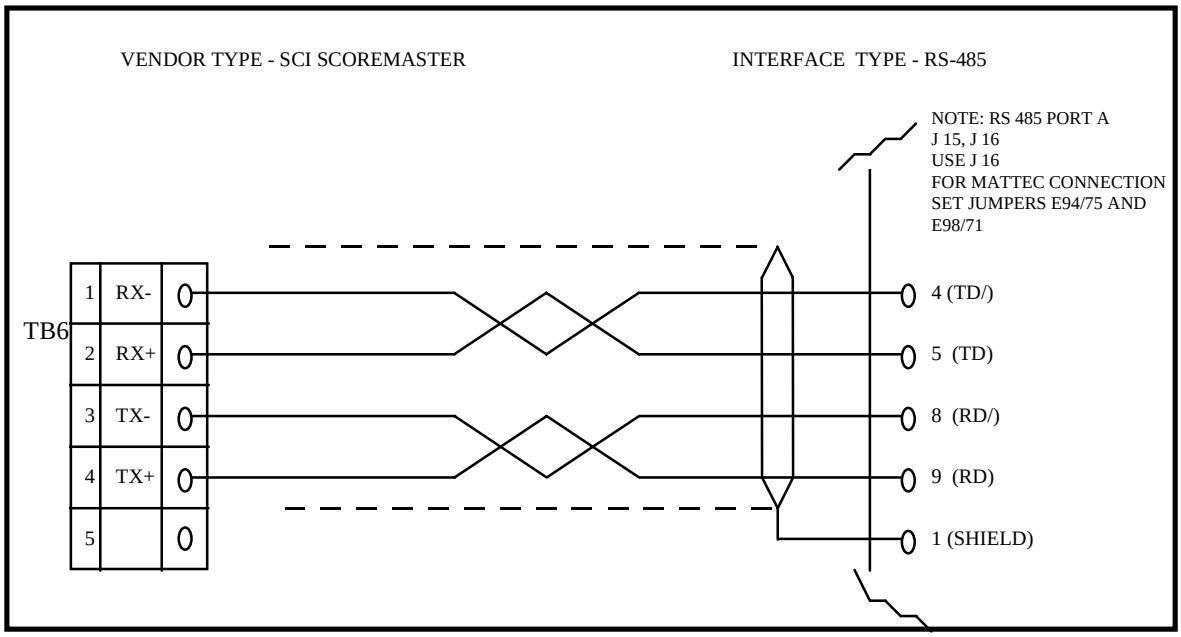

Figure 6-1 SCI Scoremaster

6.1.30 Siemens/DEMAG NCIII

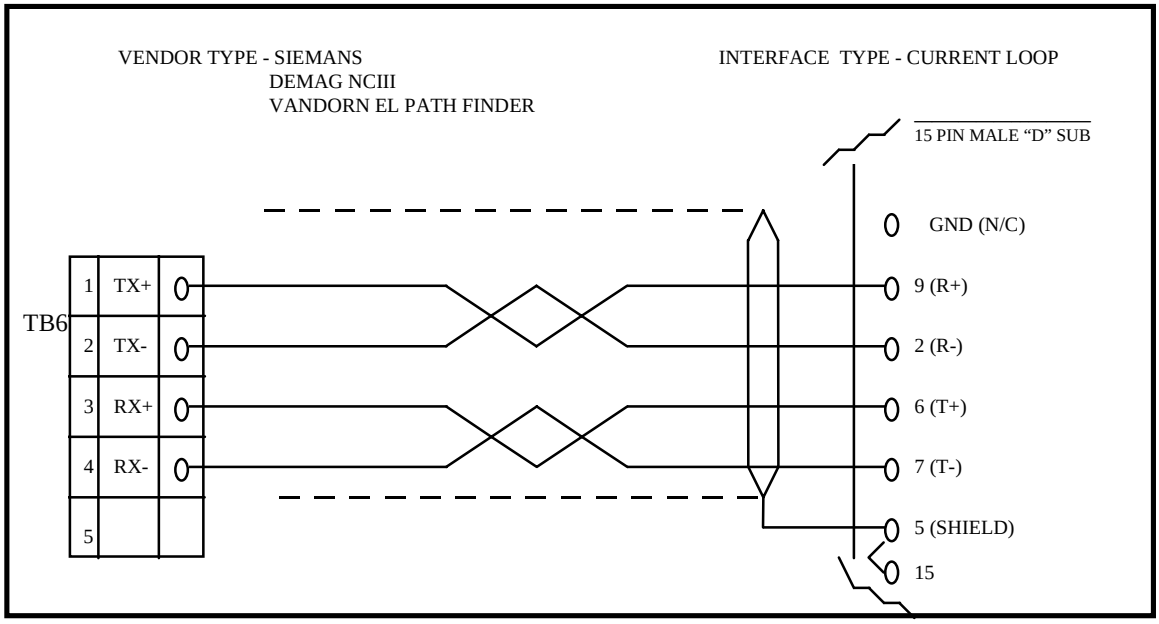

Figure 6-1 Siemens Demag NCIII

6.1.31 Siemens 944

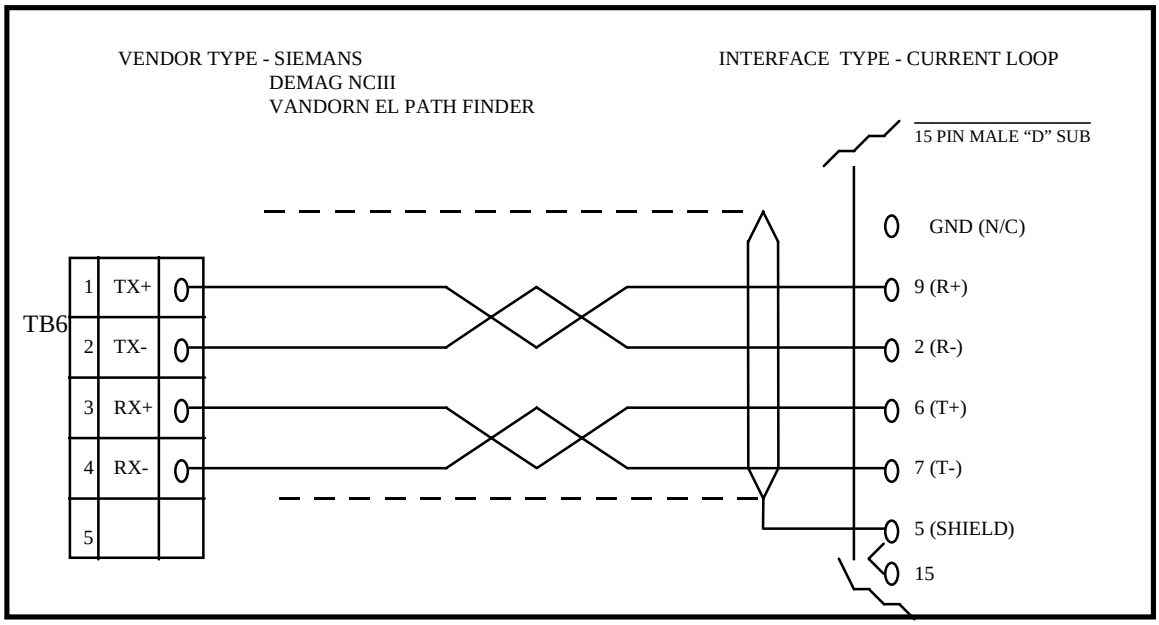

Figure 6-1 Siemens 944

6.1.32 Toshiba EX 100

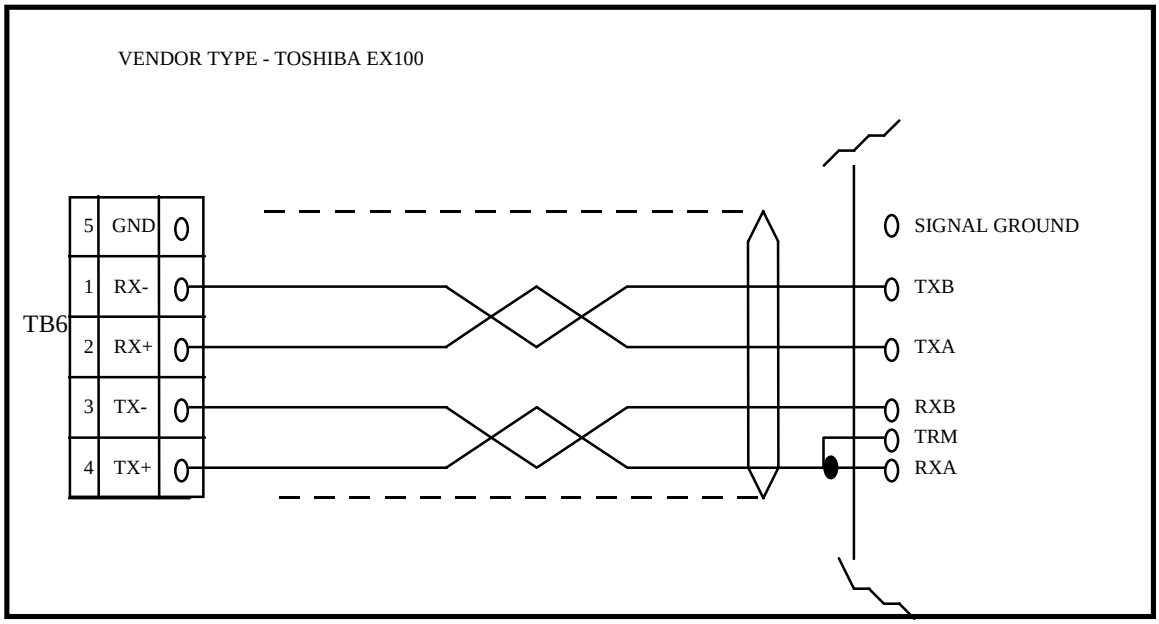

Figure 6-1 Toshiba EX100

6.1.33 Toshiba V10

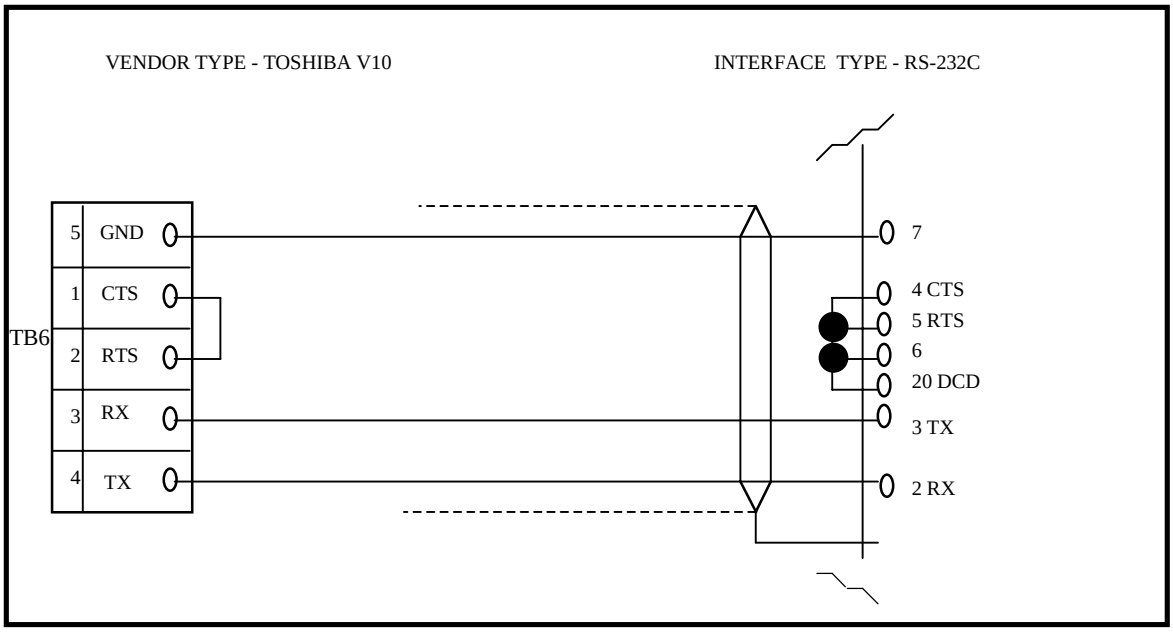

Figure 6-1 Toshiba V10

6.1.34 VanDorn EL Path Finder

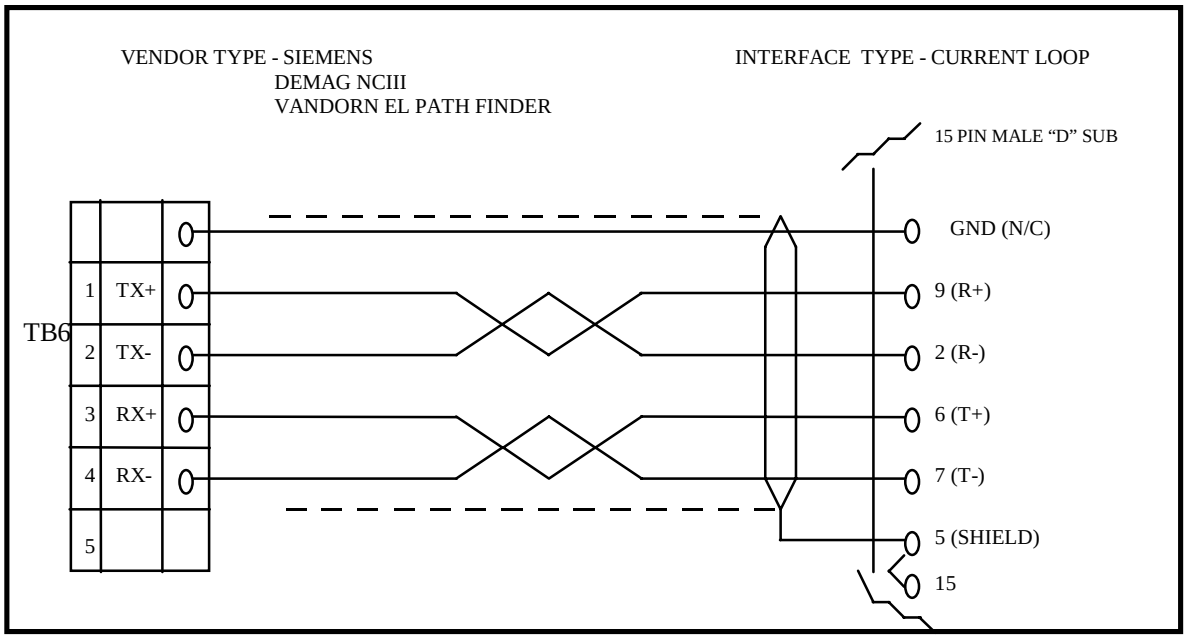

Figure 6-1 VanDorn EL Path Finder

6.1.35 VanDorn CRT-C

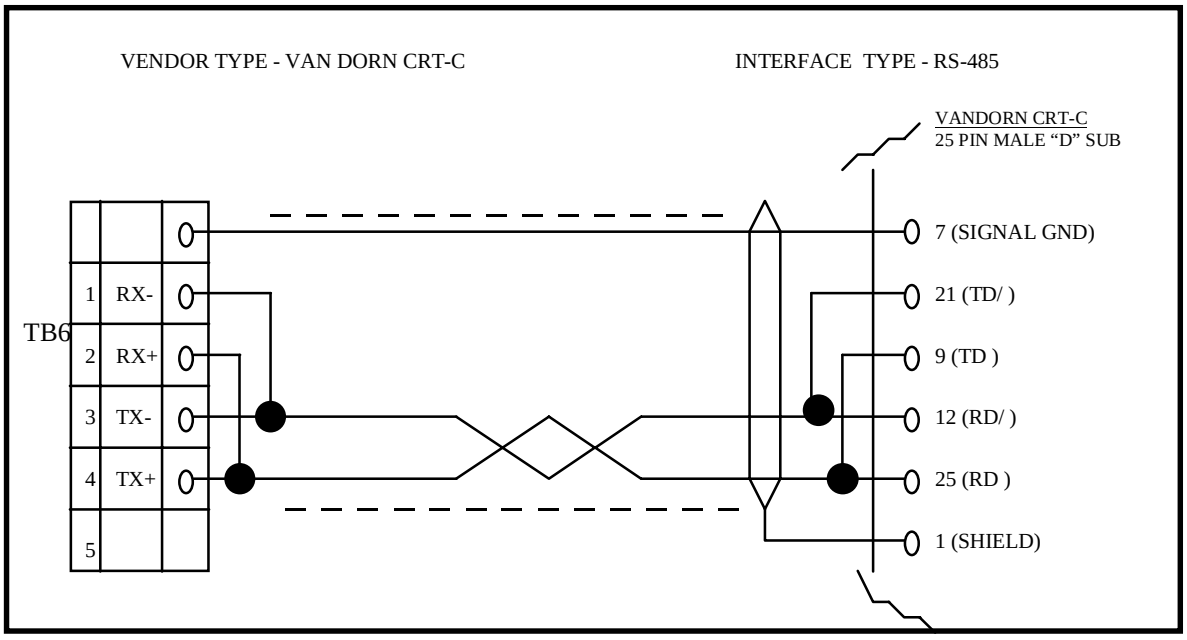

Figure 6-1 VanDorn CRT-C

6.1.36 VanDorn 4500

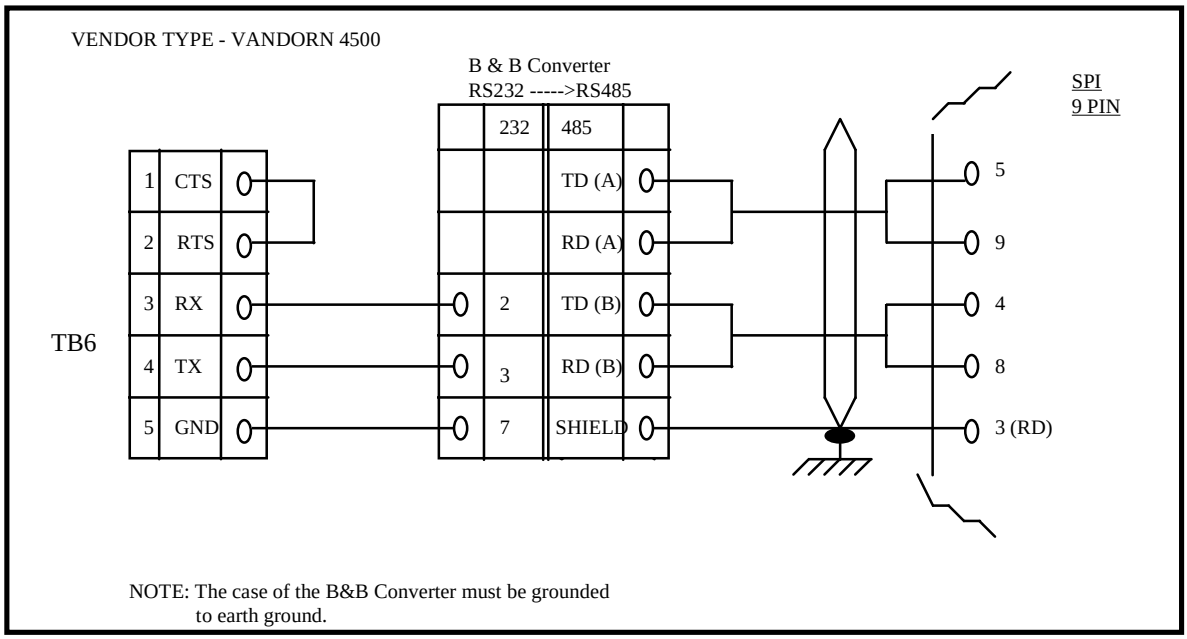

Figure 6-1 VanDorn 4500

6.1.37 Windsor Printer

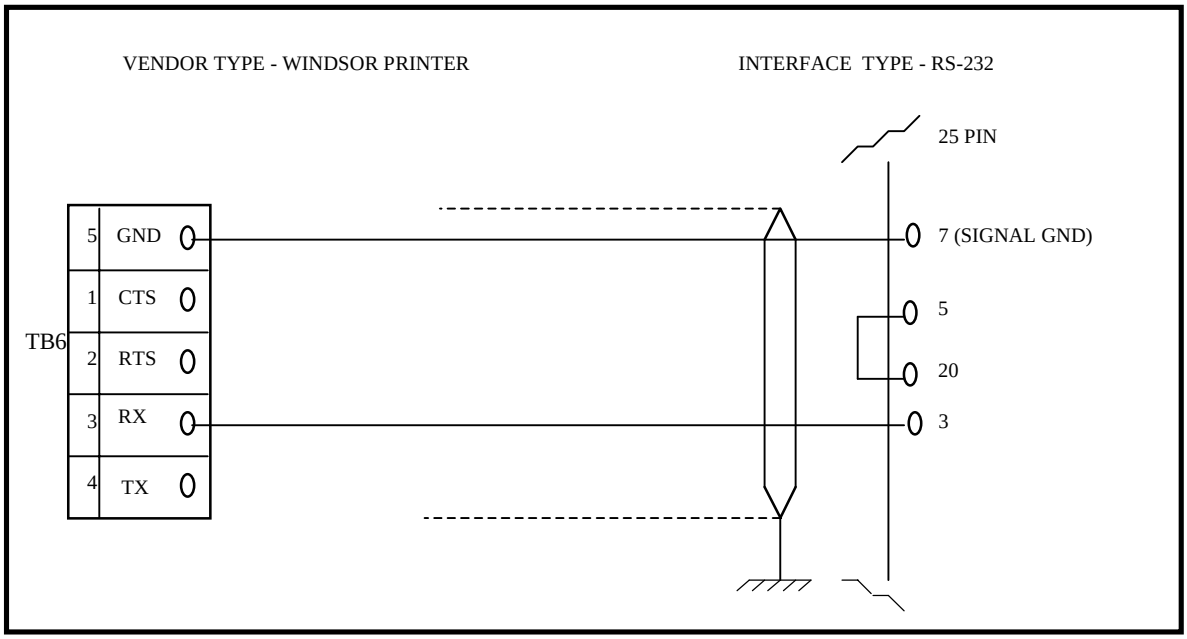

Figure 6-1 Windsor Printer

7. Appendix A - Cincinnati Milacron XTL

The following data is for **example purposes** only. Refer to the appropriate **Cincinnati Milacron Manual** for up-to-date and accurate information.

The first 1040 RW_CONV_VEC registers (numbers 0 - 1039) make up a block of registers that are always reserved for specific types of information. Other blocks that follow are reserved for additional information. The size of these additional register blocks fluctuates depending on system requirements. The following table explains how to determine the first and last register of these additional blocks, which deal with:

- Scaling, Slope
- Offset
- Host Captured Values
- Hot Runner Zones
- Additional COMM_VECs
- Alarms
- Actual Vectors
- Faults

Register Block	First Register of Block	Last Register of Block
Scaling	1040	1039+ Integer Value in COMM_VEC 89
Slope	Last register of Scaling block + 1 1040 + 80 = 1120	Last register of Scaling block + Integer Value in COMM_VEC 89
Offset	Last register of Slope block + 1 1120 + 80 = 1200	Last register of Slope block + Integer Value in COMM_VEC 89
Host Captured Values (Item #)	Last register in Offset block +1 1200 + 80 = 1280	Last register in Offset block + Integer Value in COMM_VEC 33
Hot Runner Zones	Last register in Host Captured Values block + 1 1280 + 80 = 1360	Last register in Host Captured Values block + Integer Value in COMM_VEC 69 multiplied by 6
Additional COMM_VECs	Last register in Hot Runner Zones block + 1 1360 + 80 = 1440	Last register in Hot Runner Zones block + Integer Value in COMM_VEC 83 minus 1040
Alarms	Last register in Additional COMM_VECs block +1 1440 + 80 = 1520	Last register in Additional COMM_VECs block + Integer Value in COMM_VEC 85
Actual Vector	Last register in Alarms block +1 1520 + 80 = 1600	Last register in Alarms block + Integer Value in COMM_VEC 84
Faults	Last register in Actual Vector block + 1 1600 + 80 = 1680	Last register in Actual Vector block + Integer Value in COMM_VEC 87

7.1 Read/Write Vector Definitions

Host Computer
The following table provides information on the software *Read/Write Host Computer Convert Vector*. The columns in this table are explained below.

RW_HOST-VEC#	Indicates the index number in the vector
Description	Describes the function of the index
Convert	Indicates an index number on one of the factory setup screens that provides a conversion value for the RW_HOST_VEC

RW-HOST-VEC#0	**DESCRIPTION**
Bit #	
0	Manual mode
1	Single Cycle
2	Continuous Cycle
3	Active alarm
4	Cycle interrupt
5	Auto mold change
6	Setpoint has changed since last sample
7	Cycle completed
8	Setup
9	Scheduled down time
10	Repairs
11	Material
12	Running
13	SPC data ready
14	
15	

RW_HOST_VEC#	**DESCRIPTION**	**CONVERT**
0	Status word	0
1	Cycle time	24
2	Fill time	23
3	Recovery time	23
4	Cushion position	23
5	Inject transfer position	15
6	Inject transfer pressure	16
7	Cavity transfer pressure	19
8	Inject position at start of injection	15
9	Cycle count (0-30000 low)	0

RW_HOST_VEC#	**DESCRIPTION**	**CONVERT**

10	Cycle count (number of times low register hit 30000 high)	0
11	Bad part count (0 - 30000 low)	0
12	Bad part count (number of times low register hit 30000 high)	0
13	Oil temp	24
14	Nozzle temp	24
15	Zone 1 temp	24
16	Zone 2 temp	24
17	Zone 3 temp	24
18	Feed throat temp	24
19	Zone 4 temp	24

RW_HOST_VEC#	**DESCRIPTION**	**CONVERT**
20	Nozzle temp	24
21	Sprue bushing	24
22	Zone 5 temp	24
23	Zone 6 temp	24
24	5^{th} to last setpoint changed	0
25	4^{th} to last setpoint changed	0
26	3^{rd} to last setpoint changed	0
27	2^{nd} to last setpoint changed	0
28	Last setpoint changed	0
29	Data getter cycle time	23

RW_HOST_VEC#	**DESCRIPTION**	**CONVERT**
30	Data getter clamp close fast time	23
31	Data getter clamp close slow time	23
32	Data getter clamp tonnage build time	23
33	Data getter clamp breakaway time	23
34	Data getter clamp open fast time	23
35	Data getter clamp open slow time	23
36	Data getter inject decompression time	23
37	Data getter clamp open position at stop	1
38	Data getter clamp close time	23
39	Data getter clamp open time	23

RW_HOST_VEC#	DESCRIPTION	CONVERT
40	Data getter clamp decompression time	23
41	Data getter shot size	15
42	Data getter clamp pressure	52
43	Actual viscosity	0
44	Cycle time (low register for full 32 bits)	51
45	Cycle time (high register for full 32 bits)	51
46	Inject fill time (low register for full 32 bits)	51
47	Inject fill time (low register for full 32 bits)	51
48	Recovery time (low register for full 32 bits)	51
49	Power consumption	0

RW_HOST_VEC#	DESCRIPTION	CONVERT
50	Recovery time (high register for full 32 bits)	51
51	Cycle counter (low register for full 32 bits)	0
52	Cycle counter (high register for full 32 bits)	0
53	Bad part counter (low register for full 32 bits)	0
54	Bad part counter (high register for full 32 bits)	0
55	Peak injection pressure during profile	16
56	Position for peak injection pressure during profile	15
57	Minimum injection position during pack and hold	15
58	Pressure at minimum injection position during pack and hold	16
59	Clamp fast close time (low register for 32 bits)	51

RW_HOST_VEC#	DESCRIPTION	CONVERT
60	Clamp fast close time (high register for 32 bits)	51
61	Clamp slow close time (low register for 32 bits)	51
62	Clamp slow close time (high register for 32 bits)	51
63	Clamp lockover time (low register for 32 bits)	51
64	Clamp lockover time (high register for 32 bits)	51
65	Injection position at start of injection	15
66	Injection decompress before time (low register for 32 bits)	51
67	Injection decompress before time (high register for 32 bits)	51
68	Injection position after decompress before	15
69	Injection decompress after time (low register for 32 bits)	51

RW_HOST_VEC#	DESCRIPTION	CONVERT

70	Injection decompress after time (high register for 32 bits)	51
71	Clamp breakaway time (low register for 32 bits)	51
72	Clamp breakaway time (high register for 32 bits)	51
73	Clamp open fast time (low register for 32 bits)	51
74	Clamp open fast time (high register for 32 bits)	51
75	Clamp open slow time (low register for 32 bits)	51
76	Clamp open slow time (high register for 32 bits)	51
77	Cycle count (low register for 32 bits)	0
78	Cycle count (high register for 32 bits)	0
79	Eject forward time (low register for 32 bits)	51

RW_HOST_VEC#	**DESCRIPTION**	**CONVERT**
80	Eject forward time (high register for 32 bits)	51
81	Eject maximum forward position	10
82	Eject retract time (low register for 32 bits)	51
83	Eject retract time (high register for 32 bits)	51
84	Eject minimum retract position	10
85	Clamp tonnage	4
86	Time for peak injection pressure during profile (low register)	51
87	Time for peak injection pressure during profile (high register)	51
88	End of injection time (low register for 32 bits)	51
89	Time of injection time (high register for 32 bits)	51

RW_HOST_VEC#	**DESCRIPTION**	**CONVERT**
90	Peak cavity pressure	19
91	Peak cavity pressure time (low register for 32 bits)	51
92	Peak cavity pressure time (high register for 32 bits)	51
93	Peak injection velocity	15
94	Peak injection velocity time (low register for 32 bits)	51
95	Peak injection velocity time (high register for 32 bits)	51
96	Clamp close command time (low register for 32 bits)	51
97	Clamp close command time (high register for 32 bits)	51
98	Clamp open command time (low register for 32 bits)	51
99	Clamp open command time (high register for 32 bits)	51

RW_HOST_VEC#	DESCRIPTION	CONVERT
100	Injection start time (low register for 32 bits)	51
101	Injection start time (high register for 32 bits)	51
102	Injection recovery start time (low register for 32 bits)	51
103	Injection recovery start time (high register for 32 bits)	51
104	Clamp pressure gauge	52
105	Overall clamp close time (low register)	51
106	Overall clamp close time (high register)	51
107	Overall clamp open time (low register)	51
108	Overall clamp open time (high register)	51
109	Clamp decompression time (low register)	51

RW_HOST_VEC#	DESCRIPTION	CONVERT
110	Clamp decompression time (high register)	51
111	Number of scan overruns	0
112		
113		
114		
115		
116		
117		
118		
119		

NOTE: To find the value of the index that is used by the host computer, add the value of 1220 to the RW_HOST_VEC.

Machine
The following table provides information on the software *Read/Write Machine Convert Vector*. The columns in this table are explained below.

RW_HOST-VEC#	Indicates the index number in the vector
Description	Describes the function of the index
Eng, Met	Indicates the conversion factor for both Engineering and Metric units
Rev	Indicates the revision number for the index
Save	Indicates whether or not the information in this index is saved with the mold data

	Item # starts at 1280	***Scaling*** starts at 1040	***Slope*** starts at 1120	***OFFSet*** starts at 1200
Zone 1 =	1295	1064	1144	1224

Item # =	(RW_HOST_VEC#)	+ 1280 = 15 + 1280 = **1295**
Scaling =	Convert	+ 1040 = 24 + 1040 = **1064**
Slope =	Convert	+ 1120 = 24 + 1120 = **1144**
Offset =	Convert	+ 1200 = 24 + 1200 = **1224**

Continue this formula for all items needed.

Peak Injection Pressure during Profile =

Item # starts at 1280	***Scaling*** starts at 1040	***Slope*** starts at 1120	***OFFSet*** starts at 1200
1335	1056	1136	1216

Item # =	(RW_HOST_VEC#) + 1280 =	55 + 1280 = **1335**
Scaling =	Convert + 1040 =	16 + 1040 = **1056**
Slope =	Convert + 1120 =	16 + 1120 = **1136**
Offset =	Convert + 1200 =	16 + 1200 = **1216**